

Building Sustainable Cooperatives Environmental Base: The Role of Social Capital and Technology Adoption in Different Regional Contexts



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ABSTRACT: Objective: Cooperatives institutions are currently developing towards sustainable financial institutions, so that their performance is not only a financial problem but also how the institution runs is balanced with the sustainability of the environment and the surrounding community. The purpose of this study is to measure various factors of cooperative developers about their influence on sustainable cooperative development.

Methodology: The design of this study was exploratory quantitative by taking active cooperatives in Central Java as a population. The sample size uses a minimum amount of 5 times the number of items in the study so that the sample obtained is 195 cooperatives. Data collection using questionnaires and analyzed with Structural Equation Model using WarpPLS tool.

Findings: Sustainable cooperatives can develop to encourage sustainable development by implementing cooperative social capital. Technology does not have an influence on the development of sustainable cooperatives, so the sustainability of the environment and society can be developed by cooperatives is not related to the technology used.

Theoretical and/or Methodological contributions: This research uses sustainability theory which results that cooperative institutions that are successful in implementing environmentally sustainable cooperatives must focus on internal rather than external factors.

Research/Practical Implications: Cooperative institutions are advised to improve social capital, especially with fellow members, so that the goal of becoming a financial institution that supports sustainable development can be fulfilled because its internal factors have been strengthened.

KEYWORDS: Sustainable development, Cooperatives, Social Capital, Regional Context, Technology

JEL: A13, E00, E70, H79, O17, O20

INTRODUCTION

In recent years, the concept of sustainability has gained significant attention across various sectors, including business and economics. Within this context, cooperatives have emerged as a promising model for achieving sustainable development goals (Stattman & Mol, 2014). Cooperatives are member-owned enterprises that prioritize the well-being of their members, communities, and the environment. They play a crucial role in fostering economic growth, empowering individuals, and promoting social equality. However, the successful establishment and long-term sustainability of cooperatives depend on several factors, including social capital and technology adoption.

Sustainable cooperatives, distinguished by their unwavering commitment to social, economic, and environmental objectives, have the potential to be formidable catalysts for positive change in communities and to contribute significantly to a more sustainable future (Fiore et al., 2020; Giglio et al., 2020; Marcis et al., 2019). The multifaceted importance of comprehending and researching the development of sustainable cooperatives cannot be overstated. First and foremost, sustainable cooperatives assume a pivotal role in the realm of equitable socio-economic development. These organizations offer opportunities for collective ownership, democratic decision-making, and the fair distribution of benefits, thereby empowering marginalized groups, including small-scale farmers, women, and disadvantaged communities (Kalogiannidis, 2020). Investigating the growth and evolution of sustainable cooperatives is instrumental in the identification of obstacles to inclusion, the exploration of strategies for fostering diversity and representation, and the formulation of policies that underpin the equitable expansion of cooperatives across diverse sectors and regions.

Moreover, sustainable cooperatives not only bolster economic resilience and foster social cohesion but also advance environmental sustainability through the promotion and adoption of eco-friendly practices within these cooperative structures. This

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dual approach of combining economic empowerment with environmental responsibility exemplifies a comprehensive and holistic pathway towards building resilient and sustainable communities. It is essential to recognize the profound impact that these cooperatives can have on the global quest for a more equitable, economically viable, and environmentally sustainable future.

Sustainable cooperatives contribute to addressing environmental challenges. Through sustainable practices, such as resource conservation, renewable energy adoption, waste management, and responsible production methods, cooperatives can reduce their environmental footprints and promote ecological resilience. Researching the development of sustainable cooperatives enables the identification of best practices, innovative solutions, and technologies that can drive environmental sustainability within cooperative models. It also helps assess the environmental impact of cooperatives and develop strategies to mitigate negative effects.

Building sustainable cooperatives requires a comprehensive understanding of the regional contexts in which they operate. Social capital, with its emphasis on trust, collaboration, and shared values, plays a fundamental role in fostering cooperative resilience and success. Technology adoption, on the other hand, enables cooperatives to leverage innovation for improved productivity, efficiency, and market integration. By exploring these two factors in different regional contexts, this paper aims to explore the role of social capital and technology adoption in different regional contexts in fostering development sustainable cooperatives.

LITERATURE REVIEW

Social Capital

Social capital refers to the relationships, trust, and norms that exist within a community or network. Social capital is important for the development of cooperatives (Shrestha, 2015) because it is possible for cooperation between cooperative member. This cooperation is considered as the main force because the cornerstone of the establishment of the cooperative is its members. One of the most important social capital is trust (Chloupkova et al., 2003). This opinion is reinforced by (Deng et al., 2021) which states that trust is the belief of members so that they can rely on each other in the process and development. The existence of social networks allows coordination and communication that fosters trust has positive implications in cooperative organizations (Mandarano, 2009; Valentinov, 2004; Valentinov & Iliopoulos, 2021).

The second element of social capital is the network, which is a model of relationship among members of a society or social organizations. Networks are a source of knowledge that is the main basis for the formation of strategic trust (van den Heuvel et al., 2011). The last element is a value whose existence is inseparable from networks and trust. Value will emerge from mutually beneficial exchanges. A network that is built for a long time and guarantees the benefits of both parties equally, there will be norms of justice that violate the principle of justice, then harsh sanctions will also be imposed (Kasabov, 2016; Wulandhari et al., 2022).

Social capital, as defined by organizations, represents the collaboration of all parties working collectively to address a common issue (Shrestha, 2015). In the current context, Indonesia is placing a high priority on sustainable development that considers both societal and environmental concerns. Consequently, various institutions are reevaluating their roles as supporters of this sustainable development agenda. Among these institutions are cooperative organizations, which emphasize the principles of kinship in their management structures. The adoption of these principles places a strong emphasis on the need for cooperatives to cultivate robust social capital (oh & Bush, 2016; Ruben & Heras, 2012).

The principles adopted by these cooperatives necessitate the development of strong social networks and the cultivation of trust among their members. These social networks and the bonds of trust underpin them are invaluable assets in the formation and maintenance of sustainable cooperatives (Ding & Kinnucan, 2011). The interplay of social capital within cooperatives organizations not only strengthens their internal cohesion but also enhances their capacity to engage with the broader community and contribute significantly to Indonesia's sustainable development goals. This emphasis on social capital as a foundational element underscores the cooperative's pivotal role in fostering a more inclusive, resilient, and sustainable society.

Some cooperatives in other countries prioritize developing social capital as a basis for developing sustainable cooperatives based on community. Kustepeli tried to develop agricultural cooperatives in Turkey based on the principle of social capital. Trust is a key foundation in the sustainable agriculture model run by Turkish production cooperatives (Kustepeli et al., 2020). While in China, it is developed how cooperatives can be a forum for stabilization between finance, society, and the environment. In achieving this platform, social capital is the main factor that is able to bridge between financial and community stability (Yu & Nilsson, 2019).

H1: There is a significant relation between social capital to sustainability cooperatives.

Technology Adoption

According to (Sui & Gao, 2023) cooperatives are one of the financial institutions with a high level of paper needs. This is because the membership system implemented by cooperatives includes rules and budgets that must be approved by many parties and become a reference for the running of the cooperative organization. The financial system and welfare of cooperative members also still apply a manual system with administrative processes that require a lot of paper. On research Sui & Gao it is known that at least one

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cooperative organization will produce as much as 150-kilograms of paper waste annually or an average of 0.41 kilograms per day, especially if there is a year-end meeting.

Technology adoption is another critical factor influencing the sustainability of cooperatives. Technological advancements offer opportunities for improving efficiency, productivity, and market competitiveness (Li et al., 2022). By embracing innovative solutions, cooperatives can enhance their value chains, optimize resource utilization, and reduce environmental impacts. Technology adoption facilitates innovation within cooperatives. By embracing emerging technologies, such as renewable energy solutions, cooperatives can develop novel products, services, and business models. Technology adoption contributes to the long-term sustainability of cooperatives. It allows for the implementation of sustainable practices, such as resource monitoring and management systems, precision agriculture, renewable energy integration, and waste reduction measures. Researching the influence of technology on cooperative sustainability helps identify technological solutions to environmental challenges, assess their economic viability, and develop strategies for their successful adoption (Ada et al., 2022; Akzar et al., 2022; Githinji et al., 2022).

H2: There is a significant relation between technology adoption to sustainability cooperatives.

Regional Contexts

The regional context plays a vital role in shaping the development and success of sustainable cooperatives. Various factors, such as cultural norm, economic conditions, legal frameworks, political environments, and natural resources, differ across regions and significantly impact the formation, operation, and longevity of cooperatives (Lang & Stoeger, 2018). Cultural norms and values that prevail in a particular region hold substantial sway over the degree of acceptance and adoption of cooperative principles and practices. In regions with a strong tradition of collective decision-making and community-based enterprises, cooperatives often find fertile ground to flourish. These cultural foundations facilitate the embrace of cooperative models, which are inherently built on principles of collaboration and shared ownership. Conversely, regions characterized by individualistic cultures may necessitate customized approaches to foster cooperative development (Moon & Lee, 2020). In such areas, efforts to promote cooperatives might involve education and awareness campaigns to demonstrate the benefits of collaboration and the positive impact it can have on economic and social well-being. Understanding and adapting to the regional context is paramount for the sustainable growth of cooperatives, as it ensures that these entities align with the values and needs of their communities, ultimately contributing to a more prosperous and equitable future.

Economic conditions, including market structures, labor dynamics, and availability of resources, shape the viability and sustainability of cooperatives. Regional variations in income levels, market demand, infrastructure, and access to finance can either facilitate or hinder cooperative growth (Hernández-Perlines et al., 2020). Researching these economic factors helps identify barriers and opportunities for cooperative development, enabling policymakers and practitioners to implement targeted strategies. Legal frameworks and government policies differ across regions and can significantly impact the formation and operation of cooperatives. Supportive legal and regulatory frameworks that recognize and protect cooperative autonomy, provide financial incentives, and promote cooperative-friendly policies can foster an enabling environment for sustainable cooperatives. Conversely, restrictive, or ambiguous regulations may impede cooperative growth and sustainability. Investigating the legal and policy landscape enables researchers to identify gaps and propose reforms that facilitate cooperative development.

Building sustainable cooperatives demands not only a holistic understanding of the regional contexts in which they operate but also an adept use of the tools and principles at their disposal. Social capital, a cornerstone of cooperative strength, underscores the importance of trust, collaboration, and shared values within these entities. Social networks and the bonds of trust between cooperative members provide the foundation for their mutual success, enabling effective decision-making and enhancing their capacity to tackle challenges collectively (Ruben & Heras, 2012; Tanti et al., 2022). This aspect of social capital not only contributes to the longevity and resilience of cooperatives but also fosters a sense of community and shared purpose that can be instrumental in achieving sustainable development goals.

H3: Regional contexts strengthen the significant relation between social capital to sustainability cooperatives.

H3: Regional contexts strengthen the significant relation between technology adoption to sustainability cooperatives.

METHODS

In this research endeavour, a conceptual model of organizational sustainability is meticulously constructed, employing two prominent theories. The primary objective is to shed light on the potential avenues for enhancing sustainability within cooperatives and identify the factors that can be harnessed for these purposes. The chosen research approach is exploratory and quantitative, aiming to delve deeper into the multifaceted factors that have the potential to influence the development of sustainable cooperatives.

Specifically, the study focused on cooperatives situated in Central Java as its population, with the selection of participants guided by a table developed by Heis. This table prescribed that the sample size should be a minimum of five times the number of research instrument items. In this study, a total of 39 questions were compiled into the research instruments, culminating in the

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participation of 195 cooperatives as the sample population. The data collection method for this research involved the distribution of questionnaires to the participating cooperatives, and the collected data were meticulously analyzed using Structural Equation Modelling (SEM), utilizing the powerful WarpPLS tools. This methodological approach, which combines the strengths of both quantitative analysis and SEM, allows for a comprehensive exploration of the intricacies that underpin sustainable cooperative development and the factors that can be leveraged for continuous improvement and sustainability.

RESULT AND DISCUSSION

Result Outer Model

The external model evaluates the accuracy and dependability of the variables under investigation. The accuracy of the research is determined through two types of validity: convergent validity and discriminant validity. On the other hand, dependability is assessed by examining the consistency and reliability of the indicators. Convergent validity is gauged by the Average Variance Extracted (AVE) value for each variable. A variable is considered valid if its AVE value is greater than 0.5. The following are the obtained AVE values for each variable:

Table 1. Variable AVE Value

Variable	AVE value	Information
SC	0.601	Valid
TA	0.578	Valid
RC	0.732	Valid
CS	0.641	Valid
SC*RC	1.000	Valid
TA*RC	1.000	Valid

Source: data processed in 2023

According to the provide table, all variables meet the validity criterion as their AVE value exceed 0.5. Additionally, to assess discriminant validity, AVE square values and correlations between construct are considered, where discriminant validity is established when the square root of AVE values is greater than the correlation between constructs. The variable correlation value is shown below:

Table 2. Correlations Among Latent Variables

	SC	TA	RC	CS	SC*RC	TA*RC
SC	0.775	-0.034	0.061	0.259	-0.119	0.127
TA	-0.034	0.760	-0.011	0.040	0.120	0.127
RC	0.061	-0.011	0.856	0.282	-0.188	-0.249
CS	0.259	0.040	0.282	0.800	-0.068	-0.023
SC*RC	-0.119	0.120	-0.188	-0.068	1.000	0.050
TA*RC	0.127	0.127	-0.249	-0.023	0.050	1.000

Source: data processed in 2023

By referring to the provided table, it is evident that the square root of the AVE values is greater than the correlation between constructs within the diagonal section of the variables related to social capital, technology adoption, and regional context. This confirms the validity of the study in terms of both convergent and discriminant aspects among variables. Additionally, the reliability of the variables is assessed by examining the composite reliability values, which should exceed 0.70. The following table displays the value of composite reliability:

Table 3. Composite Reliability Value

Variable	Composite Reliability
SC	0.883
TA	0.843
RC	0.916
CS	0.913
SC*RC	1.000
TA*RC	1.000

Source: data processed in 2023

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Referring to the provided table, the research variables are deemed reliable as they meet the criterion of composite reliability (>0.70). Moving forward, the construction of the indicators for each variable will be conducted to identify reflective indicators. Indicators with loading factor values below 0.40 should be eliminated, as they can introduce bias to the variables and hinder hypothesis testing. The table below illustrated the measurement of reflective indicators through loading factor values:

Table 4. Value Loading Factor

Indicators	Loading Factor	P-value
SC1	0.793	<0.001
SC2	0.779	<0.001
SC3	0.759	<0.001
SC4	0.713	<0.001
SC5	0.829	<0.001
TA1	0.853	<0.001
TA2	0.603	<0.001
TA3	0.806	<0.001
TA4	0.754	<0.001
RC1	0.813	<0.001
RC2	0.866	<0.001
RC3	0.870	<0.001
RC4	0.873	<0.001
CS1	0.903	<0.001
CS2	0.856	<0.001
CS3	0.727	<0.001
CS4	0.859	<0.001
CS5	0.862	<0.001
CS6	0.536	<0.001

Source: data processed in 2023

The loading factor value for this study is above 0.40, indicating that co indicators need to be excluded from each variable. The indicator with the highest loading factor value signifies its strong influence on the level of correlation between independent and dependent variables. All variables have fulfilled the criteria of the outer model, allowing the research framework to proceed with the analysis of the inner model. In the WarpPLS analysis, certain criteria for fit and quality index models must be satisfied. The results of the fit and quality index model are presented below:

Table 5. Fit Model and Quality Index

No	<i>Fit Model and Quality Index</i>	Result	Note
1	APC	0.185 p = 0.002	Accepted
2	ARS	0.166 p = 0.004	Accepted
3	AARS	0.148 p = 0.009	Accepted
4	AVIF	1.406	Ideal
5	AFVIF	1.113	Ideal
6	GoF	0.355	Large
7	SPR	0.750	Accepted
8	RSCR	0.969	Accepted
9	SSR	0.750	Accepted
10	NLBCDR	1.000	Accepted

Source: data processed in 2023

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The presented table indicates that the research models structure yields favorable results, allowing for the continuation of the analysis of the inner model and hypothesis testing. Consequently, both the indicator construct and model structure are deemed satisfactory, affirming the viability of proceeding with further research.

RESULT INNER MODEL

The inner model focuses on exploring the relationships and correlations between predetermined variables within the structural and conceptual framework. The figure below illustrates the correlations between the variables in this study.

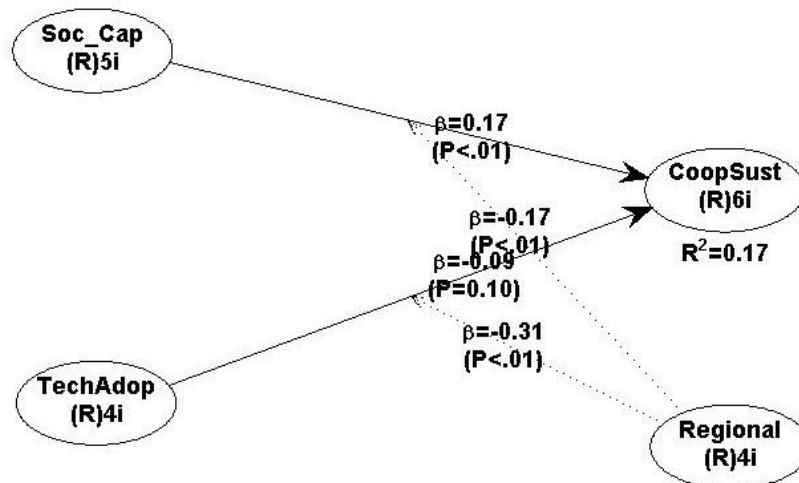


Figure 1. Research Model

Table 5. Research Model Results

No	Line	Coefficient	P-value
1.	Social capital affects cooperatives sustainability development	0.166	0.009
2.	Technology adoption affects cooperatives sustainability development	-0.092	0.097
3.	Regional contexts strengthen the influence of social capital to cooperatives sustainability development	-0.168	0.008
4.	Regional contexts strengthen the influence of technology adoption to cooperatives sustainability development	-0.312	< 0.001

Source: data processed in 2023

DISCUSSION

Social Capital Affects Cooperatives Sustainability Development

The findings derived from this study provide compelling evidence of the significant influence of social capital on the sustainability development of cooperatives, as indicated by a noteworthy p-value of 0.009. Consequently, the initial hypothesis put forth in this study has been unequivocally validated. The pivotal role of social capital in shaping the trajectory of cooperatives cannot be overstated, and this study underscores that the indicators of social capital are deeply entrenched within the very foundation of cooperatives, echoing the cooperative principle of kinship and shared values. Moreover, delving further into the implication of this result, it becomes evident that social capital acts as a binding force, fostering trust, collaboration, and a shared sense of purpose within the cooperative community. These principles are the lifeblood of cooperative entities, enabling them to navigate challenges effectively and work cohesively toward their sustainability objectives. This empirical support for the influence of social capital reaffirms its place as a linchpin in the quest for the enduring success and resilience of cooperatives, underlining the significance of this dimension in cooperative research and development.

Cooperatives are founded on the principles of collective action, democratic decision-making, and equitable distribution of benefits among members. In this context, social capital refers to the social networks, relationship, and norms of trust and reciprocity that exist among cooperative members and stakeholders. These social connections and share values create a foundation for cooperation, collaboration, and collective problem-solving, enabling cooperatives to effectively address challenges and pursue sustainable development. When it comes to environmental sustainability, cooperatives can leverage social capital to encourage members to adopt eco-friendly practices, share knowledge and best practices, and collectively work towards reducing environmental impacts.

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Moreover, social capital enables knowledge sharing and learning within cooperatives. Cooperative in Denmark (Chloupkova et al., 2003) apply sharing information on sustainable farming techniques, and waste management strategies to members so that farming is carried out not only demanding modernity, but also must continue to support the environment. Through social networks and relationship, cooperatives can tap into the collective wisdom of their members or innovation in pursuit of sustainable development.

Social capital also plays a crucial role in resource mobilization for environmental initiatives within cooperatives. By leveraging their social networks, cooperatives can access funding, technical expertise, and other resources needed to implement sustainable practices (oh & Bush, 2016). Social connections can lead to partnerships with external organizations which can provide support and resources for environmental projects. Furthermore, social capital helps cooperatives to mobilize internal resources by fostering a sense of collective responsibility and motivating members to contribute time, skills, or financial investments towards environmental sustainability initiatives (Wulandhari et al., 2022).

This research is supported by several previous studies that have proven the influence of social capital on cooperative sustainability, particularly in production cooperative. In fact, in several countries, social capital influences the relationship between cooperatives and their local communities. Cooperatives that foster social capital not only benefit their members but also contribute to community development and environmental well-being (Deng et al., 2021; Mandarano, 2009; Shrestha, 2015; van den Heuvel et al., 2011). They can engage in initiatives such as community-based natural resource management, sustainable agricultural practices, or environmental education programs. In conclusion, social capital has a significant impact on the cooperatives sustainable development, particularly in relation to environmental considerations. To enhance the cooperatives sustainability, it is crucial to recognize and nurture social capital, as it provides the foundation for environmental stewardship and long-term viability.

Technology Adoption Affects Cooperatives Sustainability Development

The findings of this study indicate that there is no significant impact of technology adoption on cooperatives sustainability development, as evidenced by a p-value of 0.097. Consequently, the initial hypothesis of the study has been rejected. The revelation of this non-significant relationship prompts a deeper reflection on the role of technology within cooperative development. While technology has often been celebrated as a catalyst for progress in various sectors, including cooperatives, this study underscores the need for nuance in understanding its role. It serves as a reminder that technology adoption is not a one-size-fits-all solution. Instead, its impact on cooperatives is contingent on a multitude of factors, including the specific context, the readiness of the cooperative, and the nature of the technology being adopted. As cooperative continue to evolve in an increasingly digital age, this nuanced perspective becomes all the more critical in ensuring that technology adoption aligns with and bolsters their overarching sustainability objectives.

Technology adoption in cooperatives often focuses on enhancing productivity, efficiency, and market competitiveness. While these outcomes may contribute to economic sustainability, they do not necessarily address environmental concerns. Technologies aimed at improving production processes, reducing cost, or increasing output may inadvertently lead to increased resource consumption, waste generation, or environmental degradation. If the environmental impact of technology adoption is not carefully assessed and mitigated, it can undermine the overall sustainability of cooperatives. Technology adoption requires careful consideration of its life cycle environmental impacts (Bukchin & Kerret, 2020). From raw material extraction to manufacturing, use, and disposal, technologies can have significant environmental footprints. Cooperatives need to assess whether the benefits gained from adopting a particular technology outweigh its environmental costs. If the environmental impacts associated with technology adoption are substantial, it can offset the potential positive contributions to cooperative sustainability.

Technology adoption in Semarang city cooperatives faces barriers related to cost, accessibility, and suitability for local environmental conditions. Many green technologies require large initial investments and require higher operating costs compared to conventional alternatives. Cooperatives that have limited financial resources, find it difficult to adopt and maintain these technologies. In addition, technologies developed or specific geographic or climate conditions are not readily applicable or effective in different collaborative contexts, limiting their potential impact on environmental sustainability.

Additionally, the successful integration of technology within cooperatives requires adequate technical skills, knowledge, and training (Liu et al., 2022). Many cooperatives, particularly those operating in rural or marginalized areas, may lack access to training programs or expertise necessary for effectively adopting and utilizing environmentally friendly technologies. The absence of technical capacity can impede the optimal utilization of technology, hindering its potential contribution to environmental sustainability. In conclusion, while technology adoption has the potential to contribute to cooperative sustainability, its impact on environmental considerations is limited. Cooperatives must carefully assess the environmental implications of technology adoption and ensure that technologies align with their sustainability objectives.

Regional Contexts Strengthen The Influence Of Social Capital To Cooperatives Sustainability Development

The findings of this study indicate that regional context has significant to be moderating variable for social capital to cooperative sustainability development, as evidenced by a p-value of 0.008. But, the significant of regional context is -0.168, it means, the role

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of the regional contexts variable is to weaken the influence of social capital on cooperative sustainability development. Consequently, the initial hypothesis of the study has been rejected.

Regional contexts encompass the geographical, cultural, economic, and social characteristics of a specific area. These contexts shape the opportunities, challenges, and resources available to cooperatives within a particular region. In some areas, regional development prioritizes economic growth and industrial development over environmental concerns (Fernandez-Guadaño et al., 2020). This emphasis on economic factors can create tensions between the pursuit of cooperative sustainability and environmental preservation. As a result, social capital's potential to drive cooperative sustainability through environmental initiatives could be hindered or overshadowed by the dominant regional development agenda.

Regional contexts play a pivotal role in shaping the awareness, comprehension, and endorsement of environmental sustainability within a community. In certain areas of Semarang City, where environmental awareness remains notably low, this deficiency has a direct impact on the limited social capital within cooperatives. This observation leads to a critical understanding of how the regional context can potentially undermine the cooperative's ability to influence environmental sustainability initiatives. Social capital, a linchpin in cooperative success, hinges upon strong relationships, trust, and shared values among community members to galvanize cooperative action. However, if the regional context fails to prioritize or place value on environmental sustainability, cooperatives operating within such regions are confronted with formidable challenges in mobilizing social capital to propel environmental endeavors. The regional context can either serve as a driving force, creating an environment conducive to collective action for sustainability, or as a hindrance, stifling cooperative efforts due to a lack of communal support. This underlines the significance of promoting environmental awareness and aligning regional values with the principles of sustainability to empower cooperatives to become effective agents of positive environmental change.

Regional contexts have different levels of environmental regulations, policies, and enforcement mechanisms. Cooperatives operating in regions with weak or inadequate environmental governance face limited external support and incentives to prioritize environmental sustainability (Stattman & Mol, 2014; van den Heuvel et al., 2011). Without a conducive regulatory framework and enforcement mechanism, cooperatives may struggle to implement environmentally friendly practices, despite the presence of strong social capital.

In conclusion, regional contexts, as a moderating variable, can weaken the influence of social capital on cooperative sustainability development. Dominant regional development agendas, low environmental consciousness, weak governance, and economic pressures can all contribute to this weakening effect. Recognizing the role of regional contexts in shaping the relationship between social capital and cooperative sustainability is crucial for developing targeted strategies and interventions that address these contextual challenges. By actively engaging with regional dynamics and fostering supportive regional environments, cooperatives can better leverage social capital to drive environmental sustainability and enhance their overall sustainability development.

Regional Contexts Strengthen The Influence Of Technology Adoption To Cooperatives Sustainability Development

The findings of this study indicate that regional context has significant moderating variable for technology adoption to cooperative sustainability development, as evidenced by a p-value of <0.001 . But, the significant of regional context is -0.312 , it means, the role of the regional contexts variable is to weaken the influence of technology adoption on cooperative sustainability development. Consequently, the initial hypothesis of the study has been rejected.

Regional contexts encompass the geographical, cultural, economic, and social characteristics of a specific area. These contexts shape the opportunities, challenges, and resources available to cooperatives within a particular region. In the case of technology adoption, regional contexts can vary in terms of infrastructure, access to resources, and technical expertise (Bruque & Moyano, 2007). Cooperatives operating in regions with limited technological infrastructure or scarce resources may face challenges in effectively adopting and utilizing environmentally sustainable technologies. The lack of supportive regional environments can weaken the potential impact of technology adoption on cooperative sustainability development, particularly in relation to environmental initiatives.

Regional contexts can influence the level of environmental awareness, priorities, and policies within a community. In regions where environmental sustainability is not a top priority, the potential for technology adoption to drive cooperative sustainability, particularly in environmental terms, would be hindered (Chen et al., 2019). Technology adoption aimed at improving production processes, reducing costs, or increasing market competitiveness may not necessarily align with environmental concerns in regions where economic growth is prioritized over environmental conservation. As a result, the adoption of technologies that are environmentally sound could not be actively pursued or supported within regional contexts that do not prioritize or value environmental sustainability (Xia et al., 2019).

Some regions have different levels of regulatory frameworks, incentives, and support mechanisms for environmentally sustainable technologies. Cooperatives operating in regions with weak or inadequate environmental governance face limited external support and incentives to adopt and implement environmentally friendly technologies (Marcis et al., 2019). In such cases, the potential impact of technology adoption on cooperative sustainability development could be weakened. The absence of a conducive

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regularoty framework and supportive mechanisms can impede the integration of environmentally sustainable technologies into cooperative operations, hindering the potential for technology adoption to drive environmental sustainability (Giglio et al., 2020).

In conclusion, regional contexts, as a moderating variable, can weaken the influence of technology adoption on cooperative sustainability development, particularly with regards to environmental considerations. Recognizing the role of regional contexts in shaping the relationship between technology adoption and cooperative sustainability is crucial for developing targeted strategies and interventions that address these contextual challenges. By actively engaging with regional dynamics and fostering supportive regional environments, cooperatives can better leverage technology adoption to drive environmental sustainability and enhance their overall sustainability development.

CONCLUSION

This study states the fact that social capital is the main pillar for the development of cooperatives in any aspect. In this research, social capital becomes the key element that needs to be strengthened as it has a strong and significant influence on the development of environmentally sustainable cooperatives. Cooperative institutions prioritize their members, relying on honesty among members, the networks they possess, and the trust among members. On the other hand, the adoption of technology is found to be insignificant because some cooperatives in Semarang city have members with limited human resources. Therefore, when cooperatives adopt technology for environmentally based development, it is feared that it will increase costs for the cooperatives as they need to provide training for their members.

Regional contexts weaken the influence of both variables in this study for similar reasons. Some cooperatives located in regions where the local government does not support sustainability choose not to develop their cooperatives in the realm of environmentally based financial institutions. This is particularly true for regions that do not prioritize sustainability, as their focus is still on conventional approaches to improving community welfare. In social capital, regional contexts, especially political factors, play a sensitive role. The presence of political issues in the indicators of regional contexts is the strongest aspect that weakens the influence of social capital since it raises doubts about the honesty of both the members and the government.

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