FUTURE SCIENCE



# REGIONAL PLANNING AND RURAL DEVELOPMENT

ISBN 978-621-96812-9-2

Gunawan Prayitno
Ismu Rini Dwi Ari
Jacqueline Hiddlestone-Mumford
Enock Siankwilimba
Alifia Issabella Mulywati

# REGIONAL PLANNING AND RURAL DEVELOPMENT


**EDITORS**

Gunawan Prayitno (Indonesia)

Ismu Rini Dwi Ari (Indonesia)

Jacqueline Hiddlestone-Mumford (United Kingdom)

Enock Siankwilimba (Zambia)

Alifia Issabella Mulyawati (Indonesia)



**©FSH-PH Publications**

This work is subject to copyright. All rights are reserved by the Publisher, whether the whole or part of the material is concerned, specifically the rights of translation, reprinting, reuse of illustrations, recitation, broadcasting, reproduction on microfilms or in any other physical way, and transmission or information storage and retrieval, electronic adaptation, computer software, or by similar or dissimilar methodology now known or hereafter developed.



#72 Salang Street Matain, Subic. 2209. Philippines

**Mobile number**: 09088602939; 09088602939

**ISBN** 978-621-96812-9-2

**DOI:** https://doi.org/10.11594/futscipress21m

# CONTRIBUTORS AFFILIATIONS

**Agus Dwi Wicaksono,** Regional and Urban Planning Department, Engineering Faculty, Brawijaya University, Malang, Indonesia.

**Aris Subagiyo,** Regional and Urban Planning Department, Engineering Faculty, Brawijaya University, Malang, Indonesia.

**Bernard Mudenda Hang'ombe,** Department of Para-Clinical Studies, School of Veterinary Medicine, The University of Zambia, Lusaka, Zambia; Africa Center of Excellence for Infectious Diseases of Humans and Animals, The University of Zambia, Lusaka, Zambia.

**Chisoni Mumba,** University of Zambia, School of Veterinary Medicine, Lusaka, Zambia.

**Dian Dinanti,** Regional and Urban Planning Department, Engineering Faculty, Brawijaya University, Malang, Indonesia.

**Enock Siankwilimba,** Musika Development Initiatives Zambia Limited; Graduate School of Business, University of Zambia, Lusaka, Zambia.

**Fadly Usman,** Regional and Urban Planning Department, Engineering Faculty, Brawijaya University, Malang, Indonesia.

**Gunawan Prayitno,** Regional and Urban Planning Department, Engineering Faculty, Brawijaya University, Malang, Indonesia.

**Ismu Rini Dwi Ari,** Regional and Urban Planning Department, Engineering Faculty, Brawijaya University, Malang, Indonesia.

**Jacqueline Hiddlestone-Mumford,** School of Management, Faculty of Humanities and Social Sciences, University of Liverpool, United Kingdom; Ducere Global Business School, US/Australia/UK/Africa.

**Janine LeaBarrett,** Society Chair, MEMMES - Engineers Australia.

**Turniningtyas Ayu Rahmawati,** Regional and Urban Planning Department, Engineering Faculty, Brawijaya University, Malang, Indonesia.

**Wawargita Permata Wijayanti,** Regional and Urban Planning Department, Engineering Faculty, Brawijaya University, Malang, Indonesia.

**Alifia Issabella Mulyawati,** Doctoral Student at Biotechnology, School of Bioresources and Technology, King Mongkut's University of Technology Thonburi, Bangkok, Thailand.

# CONTENTS

CHAPTER 1: OVERVIEW OF REGIONAL PLANNING AND RURAL DEVELOPMENT.....9
*Ismu Rini Dwi Ari, Gunawan Prayitno, Jacqueline Hiddlestone-Mumford, and Enock Siankwilimba*

CHAPTER 2: INTRODUCTION OF SUSTAINABLE REGIONAL AND VILLAGE PLANNING.....16
*Gunawan Prayitno, Agus Dwi Wicaksono, and Aris Subagiyo*

CHAPTER 3: SUSTAINABLE REGIONAL PLANNING FOR RURAL DEVELOPMENT.....29
*Gunawan Prayitno, Enock Siankwilimba, and Jacqueline Hiddlestone Mumford*

CHAPTER 4: THE ROLE OF SOCIAL CAPITAL IN INCREASING COMMUNITY PARTICIPATION PLANNING.....43
*Ismu Rini Dwi Ari, Gunawan Prayitno, and Wawargita Permata Wijayanti*

CHAPTER 5: MANAGEMENT OF NATURAL RESOURCES IN VILLAGES FOR SUSTAINABILITY....55
*Wawargita Permata Wijayanti, Aris Subagiyo, and Gunawan Prayitno*

CHAPTER 6: VILLAGE COMMUNITY EMPOWERMENT THROUGH STRENGTHENING SOCIAL CAPITAL.....67
*Gunawan Prayitno, Aris Subagiyo, and Agus Dwi Wicaksono*

CHAPTER 7: VILLAGE-BASED DISASTER MITIGATION.....78
*Fadly Usman, Aris Subagiyo, and Turniningtyas Ayu Rachmawati*

CHAPTER 8: INCREASING VILLAGE CAPACITY IN FACING NATURAL DISASTERS .....91
*Turniningtyas Ayu Rachmawati, Fadly Usman, and Dian Dinanti*

CHAPTER 9: ECONOMIC AND SOCIAL SUSTAINABILITY IN VILLAGE AREA PLANNING..... 101
*Dian Dinanti, Gunawan Prayitno, and Fadly Usman*

CHAPTER 10: COMMUNITY PREPAREDNESS IN FACING NATURAL DISASTERS..... 116
*Agus Dwi Wicaksono, Gunawan Prayitno, and Dian Dinanti*

CHAPTER 11: SUSTAINABILITY THROUGH AGRICULTURAL EXTENSION SERVICES..... 128
*Enock Siankwilimba, Jacqueline Hiddlestone-Mumford, Bernard Mudenda Hang'ombe, Chisoni Mumba, Gunawan Prayitno, Ismu Rini Dwi Ari, and Janine LeaBarrett*

# ABOUT THE EDITORS

**Gunawan Prayitno, Ph.D.**, is a Professor at the Department of Regional and Urban Planning, Faculty of Engineering, Brawijaya University, Malang, Indonesia. He completed his Ph.D. at the University of Kyoto, Japan in 2015. Prof Gunawan has published over 50 publications in reputable international journals (Scopus and Web of Science), national journals, book chapters, and more than seven reference books and monographs. He is a reviewer for many international journal publishers like ScienceDirect, Springer, Emerald, Taylor, and Francis. He has been a consultant in various planning and study activities at national, provincial, regency, and city levels in Indonesia. He is the Chief Editor of the Civil and Environmental Science Journal (CIVENSE) and the Journal of Regional and Rural Studies (RRS). Currently, he also serves as Chair of the Journal Publishing Agency (BPJ) and Chair of the Regional Development and Public Policy Laboratory at the Faculty of Engineering, Brawijaya University. His primary expertise is in regional planning, rural planning, community development, and regional economics.

**Ir. Ismu Rini Dwi Ari, MT., Ph.D.**, is an Associate Professor at the Department of Regional and Urban Planning, Faculty of Engineering, Brawijaya University, Malang, Indonesia. He serves as Deputy Dean for General Affairs, Finance, and Human Resources at the Faculty of Engineering, Universitas Brawijaya. He completed a bachelor's degree in the Department of Architecture, Brawijaya University in 1991 and a master's degree in the Department of Regional and Urban Planning in 1995; apart from that, Ms. Ismu also succeeded in completing a doctoral degree in the Urban Management Department, Graduate School of Engineering, Kyoto University, Japan in 2011. Her primary expertise is in urban & rural infrastructure planning and development within the scope of regional and city planning.

**Dr. Jacqueline Hiddlestone-Mumford** attained her doctorate with the University of Liverpool (UK) and is an academic Professor for Ducere Global Business School, teaching and supervising in Australia, the UK, US, and Europe. With numerous peer-reviewed international journal articles, conference papers, book chapters, and an international bestselling book published, Jacqueline's research interests include strategy, culture, transformational change, organisational learning, SMEs, sustainability, climate change and infrastructure delivery. Jacqueline is an editor for the Civil and Environmental Science Journal, (CIVENSE), Journal of Regional & Rural Studies (RRS), and Journal of Policy and Society. Jacqueline also provides peer reviews for the International Journal of Organisational Analysis, The Learning Organisation, the British Academy of Management, and various conferences. With over 30 years in academia, executive management in private and public sectors, Board member, and consulting in strategy development through operational delivery and cultural integration, Jacqueline's innovative solutions have earned local and international awards. Her most recent was the APAC Insider Best Business Consultancy CEO 2023. Jacqueline is a Fellow and Chair of the Regional Advisory Board for the Institute of Managers and Leaders, Track Co-chair for the Strategy-as-Practice Special Interest Group (SIG), and SIG Chair of Organisational Transformation Change and Development at the British Academy of Management. She has also provided local, national, and international speaker, facilitation, and key speaker engagements.

**Enock Siankwilimba** is an agricultural market system development expert with over 20 years of experience, having worked in different donor-funded extension programs and projects in Zambia. He is one of the seasoned market system experts (making the market work for the poor M4P) in Zambia. He is one of the founder members of Musika Development Initiative Zambia limited, a company he is currently serving as a Consultant, Technical Advisor. He is a fully paid-up member of the Economic Association of Zambia (EAZ) and Zambia Network for Environmental Educators and Practitioners (ZANEEP). He is a Ph.D. student at the Graduate School of Business Studies at the University of Zambia. His study is based on the Development of a Framework for a Sustainable Cattle Business Model for Small Scale Cattle Farmers: The Case of Namwala District of Zambia using a systems dynamic approach. Furthermore, Enock's research focuses on agricultural market system development, livestock and crop business models, climate change, value chain development, and rural agricultural extension development. He holds a Master of Art in Transformative Community Development, a Bachelor of Arts in Development Studies, and a General Certificate in General Agriculture. Since 2019, Enock has authored and co-authored over 18 articles in collaboration with local and international academic peers indexed in an international reputable journal and book chapters. Enock is an editor for the Journal of Policy and Society, Journal of Regional & Rural Studies, (RRS), World Agricultural Economy (RWAE), Civil and Environmental Science Journal (CIVENSE) and a reviewer at Cogent Social Sciences.

**Alifia Issabella Mulyawati** is currently undergoing her final year of a doctoral degree at the King Mongkut's University of Technology Thonburi, Thailand. She is a translation and proofreading manager at KLINIKJURNAL, Indonesia. She has published several scientific articles in journal publishers indexed by Web of Science and SCOPUS and assisted other authors worldwide in publishing their research reports. She has more than eight years of experience in reviewing and editing international journals and scientific articles.

# LIST OF TABLES

**Table 7.1** Composite Reliability and AVE Measurement Model Values .....88
**Table 7.2** Correlation between variables .....88
**Table 7.3** Structural Model Path Coefficient Values.....88
**Table 8.4** Comparison of Properties of Tacit vs Explicit Knowledge.....95
**Table 10.5** Preparedness Dimensions and Activities.....122
**Table 11.6** Different question techniques for processing role play and their example answers matrix.....135
**Table 11.7** Evaluation of the successful adoption of new technologies by farmers .....136
**Table 11.8** Farmer learning from experience: six guiding principles.....141

# LIST OF FIGURES

**Figure 5.1** Essential elements of rural development....56
**Figure 5.2** Sunrise and rows of *jukung* on Amed Beach....58
**Figure 5.3** View of Gunung Agung....58
**Figure 5.4** Bahari Tourism....59
**Figure 5.5** Impact of the rural development to livelihoods of rural people in Desa Purwakerti....61
**Figure 7.6** Disaster Prone Areas I, II and III....79
**Figure 7.7** Schematic and parameters in the analysis with PLS-SEM method....81
**Figure 7.8** The condition of Mount Bromo when the eruption occurred....83
**Figure 7.9** Traditional ceremonies, Mount Bromo and Luhur Poten Temple in the Mount Bromo Crater Area....84
**Figure 7.10** Loading Factor Value After Indicator Elimination....87
**Figure 9.11** Three Pillars of Sustainable Development....102
**Figure 9.12** Sustainable Development Goals (source: un.org)....103
**Figure 9.13** Typical structure of a PPP project (source: UN ESCAP (United Nations Economic and Social Commission for Asia and the Pacific), 2011)....108
**Figure 9.14** Overcoming the structural challenges to develop sustainable villages....111
**Figure 10.15** Indigenous disaster mitigation pattern....124
**Figure 11.16** Extension work capabilities and skills set in the agricultural ecosystems (adapted from Chamber, 1989)....130
**Figure 11.17** Group mobilisation starts with engaging and recognising the local leadership and the traditions and culture (photos source: authors)....132
**Figure 11.18** Socratic Dialogue in action as applied in extension delivery in the field. (Data source: Stavru & Moore, 2017)....133

# CHAPTER 1: OVERVIEW OF REGIONAL PLANNING AND RURAL DEVELOPMENT

***Authors: Ismu Rini Dwi Ari, Gunawan Prayitno, Jacqueline Hiddlestone-Mumford, and Enock Siankwilimba***

## Abstract

This book consists of eleven chapters with the first chapter as an introduction and ten chapters different discussion focuses. Overall, this book summarises various important aspects of regional planning and sustainable rural development. Readers will be taken through a journey that begins with a fundamental understanding of regional planning and the importance of sustainable rural development. Basic concepts such as regional planning objectives and steps are clearly explained. Next, this book discusses the important role of social capital in increasing community participation in planning. From social networks to trust, shared norms, and cooperation, all components of social capital are explained. Natural resource management in rural areas is also an important focus, with an emphasis on the balance between development policies and natural resource management. This includes the importance of sustainable village development, which involves various aspects such as the economy, education, health, sustainable agriculture, clean water resources, renewable energy, and encouraging fair economic growth. This book provides a comprehensive view of the challenges and opportunities in regional planning and sustainable rural development, with a focus on the principles of sustainability, community participation and natural resource management.

**Keywords:** planning, development, sustainable

## 1.1 Introduction

Over the past few decades, regional planning has experienced notable transformation, advancement and has witnessed various trends and evolutions that have garnered significant attention. These include a heightened emphasis on sustainability, the integration of information technology, more involvement of local communities, the implementation of resilience planning, addressing the impacts of climate change, promoting social inclusion, and other related aspects. Regional planning is characterised by its ongoing evolution and responsiveness to social, economic, and environmental shifts. This necessitates implementing a planning approach characterised by more flexibility, reliance on empirical knowledge, and adaptability to address new modern concerns. Regional planning plays a crucial role in the organisation, management, and direction of regional development. Regional planning is a systematic procedure that governs the allocation and utilisation of land and resources within a particular geographical region.

The interrelationship between village development and regional planning is crucial in pursuing sustainable village development. The concept of rural development has transformed in recent decades, with a greater emphasis on the principles of sustainability, inclusivity, and resilience in rural areas. Village development encompasses a series of endeavours to enhance the standard of living, economic conditions, social

*Ismu Rini Dwi Ari*, Gunawan Prayitno, Jacqueline Hiddlestone-Mumford, and Enock Siankwilimba*
**email: dwiari@ub.ac.id*
https://doi.org/10.11594/futscipress182

fabric, and infrastructure within rural regions. The successful growth of a village necessitates the harmonious integration of diverse components, including but not limited to economic, social, environmental, and cultural aspects. Regional planning in village development is a systematic approach encompassing the formulation of plans and regulations aimed at effectively managing land utilisation and facilitating controlled expansion and progress within rural locations. The use of regional planning in the context of village development is anticipated to yield villages with sustainability, resilience, and environmentally friendly characteristics. The procedure is intricate and necessitates the cooperation of governmental entities, local communities, and other relevant parties. Hence, the present discourse will go into regional planning and rural development, encompassing ten chapters of varied discussion. The above sources offer valuable insights and perspectives on intricate themes related to regional planning and village development.

## 1.2 Summary Of The Content Of The Book Chapters

**CHAPTER 2. INTRODUCTION OF SUSTAINABLE REGIONAL AND VILLAGE PLANNING**

Regional and village planning is essential in controlling a region's development and progress. Sustainable regional and village planning has become vital in a modern period marked by climate change, expanding urbanisation, and rising socioeconomic issues. Sustainable regional and village planning is a strategy that incorporates ecological, social, economic, and cultural factors into the planning process. The goal is to establish a balanced and sustainable environment in which the current generations' demands may be addressed without jeopardising the future generations' ability to meet theirs. Thus, sustainable planning balances efficient development and preserving the natural environment.

Sustainable regional and village planning can help communities deal with climate change, environmental degradation, social inequality, and economic resilience. By considering these factors in the planning process, regions and villages can reduce risks and create opportunities for sustainable growth. The importance of sustainable regional and village planning lies in its ability to provide clear directions in decision-making regarding resource allocation, infrastructure development, environmental preservation, community empowerment, and economic diversification. It also allows adaptation to environmental and social changes that occur over time. Therefore, sustainable regional and village planning not only formulates plans but also becomes essential in making sustainable decisions that broadly impact balanced and sustainable rural development.

**CHAPTER 3. SUSTAINABLE REGIONAL PLANNING FOR RURAL DEVELOPMENT**

Incorporating sustainable regional planning has emerged as a fundamental basis for effectively tackling the complexities associated with sustainable rural development. Rural areas play a crucial role in upholding natural resources, ensuring food security, and fostering social welfare, serving as an indispensable component of the global ecosystem. Sustainable regional planning encompasses integrating ecological, social, and economic dimensions while formulating decisions about rural development. The objective is to cultivate resilient rural communities that exhibit environmental sustainability, resilience to climate change, and equitable possibilities for enhancing the well-being of their inhabitants.

The primary objective of sustainable regional planning entails the mitigation of adverse environmental consequences, the advancement of social equity, and the enhancement of rural economic resilience. Integrating a sustainable approach within regional planning for rural regions is of paramount significance in enabling rural communities to effectively address the multifaceted difficulties they encounter, including climate change, land degradation, and population migration. The notion of sustainable regional planning for rural development has yet to be fully tailored to each rural area's specific demands and distinct characteristics.

Sustainable regional planning for rural development entails a comprehensive approach integrating varying components to attain sustainable development objectives within rural regions. The initiative mentioned above holds advantages for rural areas and significantly contributes towards global sustainability.

## CHAPTER 4. THE ROLE OF SOCIAL CAPITAL IN INCREASING COMMUNITY PARTICIPATION PLANNING

Social capital, comprising trust, conventions, and networks within a community, is crucial in supporting and augmenting community engagement in planning endeavours. The community's involvement in planning is paramount to attaining sustainable and inclusive development. Community participation in planning is facilitated by social capital, which establishes a foundation of trust and reciprocity among individuals within the community. This fosters a culture of collaboration, resource sharing, and active involvement in decision-making among individuals.

Societies characterised by elevated levels of social capital frequently exhibit enhanced resilience, adaptability, and efficacy in addressing local difficulties. Social capital facilitates establishing robust and trustworthy interpersonal connections within a given group. This phenomenon promotes individuals' active engagement in the planning process due to the perceived value of their input and the belief that collective decision-making yields advantages for all involved parties. Social capital has the potential to surmount obstacles that hinder community involvement, including but not limited to social exclusion, resource scarcity, and power disparities.

Through utilising pre-existing social and trust networks, individuals within a community can actively influence the planning process and advocate for their specific needs and interests. The significance of social capital in enhancing community engagement in planning endeavours cannot be overstated. Recognition and utilisation of social capital within communities can improve planning processes' inclusivity, sustainability, and efficacy. Enhancing social capital within communities enables governments, development agencies, and community groups to establish a more robust basis for sustainable development.

## CHAPTER 5. MANAGEMENT OF NATURAL RESOURCES IN VILLAGES FOR SUSTAINABILITY

Managing natural resources at the village level is crucial in maintaining economic, social, and environmental sustainability in rural communities. Villages are often centres of agriculture, fishing, forestry, and other natural resource activities. Therefore, efforts that focus on sustainable management of natural resources are essential for preserving the environment, reducing social inequality, and improving the welfare of rural communities.

Natural resource management includes wise use, conservation, rehabilitation, and sustainable development. It involves village communities planning, monitoring, and decisions regarding their natural resources. The main challenge in managing natural resources in villages is balancing economic needs, environmental preservation, and social welfare. Villages often have limited resources, so optimising the use of existing resources by considering environmental and social aspects is essential.

The importance of a community-based and participatory approach to natural resource management is emphasised, as in the case study in Purwakerti Village, Bali Province, Indonesia, with abundant coconut, cashew, corn, and peanut commodities. A failure to attract the younger generation to engaging in the agricultural/plantation sector has resulted in agricultural/plantation land decreasing, and land development moving towards development, especially in tourism. This has resulted in agricultural land in Purwakerti Village to continue to decline. This is an essential example of managing village-level natural resources for sustainability.

## CHAPTER 6. VILLAGE COMMUNITY EMPOWERMENT THROUGH STRENGTHENING SOCIAL CAPITAL

Community empowerment refers to efforts to give communities control over their own resources, decisions, and development. Community empowerment as a process to increase capacity, knowledge, skills, and social and economic control in a society. In empowering village communities, social capital is an alternative for developing the community. This chapter discusses the empowering of village communities through strengthening social capital. The social capital owned by the community, especially in rural areas, is a valuable asset in society that can improve the quality of life, support economic development, and create a more harmonious and productive social environment.

Social capital can provide insight into the importance of social elements in society such as togetherness, solidarity, reciprocity, trust, social networks, norms, tolerance between communities and participation which are an important basis for empowering and developing village communities. The existence of community social capital can facilitate the community in resolving problems, because it can function and strengthen a community or institution in society.

This chapter presents an introduction to social capital in village communities, the role of human resources in the modern economic system, challenges of social capital in village communities, the concept of empowering village communities, strategies for strengthening social capital in villages, tools and approaches to empowering social capital, offers successful cases of strengthening social capital, overcoming obstacles and challenges, and measuring and evaluating the impact of social capital. It is hoped that the study of community empowerment through social capital in this chapter will provide a new perspective for understanding the role of social capital in village communities, and can further reflect developments and changes both from the social and economic side of society. In rural communities, social capital remains a valuable asset that can be used to overcome challenges and advance community welfare.

## CHAPTER 7. VILLAGE-BASED DISASTER MITIGATION

Natural disasters like earthquakes, floods, storms, and droughts often seriously impact rural communities. Disaster mitigation, the actions taken to reduce risks, losses, and effects of disasters, has a crucial role in protecting the lives and property of villagers

and promoting the sustainability of rural communities. Village-based disaster mitigation refers to a series of actions and strategies that village communities can implement to identify, measure, and manage disaster risks.

Involving communities in the planning and implementation of mitigation efforts not only enhances their understanding of disaster risk but enables more relevant and sustainable solutions. By prioritising village-based disaster mitigation, rural communities can reduce losses caused by disasters, protect their natural resources and environment, and ensure the survival and well-being of rural communities.

The Tengger people, who live at the foot of Mount Bromo in Indonesia, have long adapted to the potential risks of a threatening volcanic eruption. The local wisdom that they have developed over the years is the key to dealing with and mitigating the adverse effects that may occur due to the outbreak of Mount Bromo. In the Tengger area, communities have developed local knowledge and practices that include disaster response planning, community empowerment, and everyday practices that help them deal with the threat of an eruption of Mount Bromo. By taking into account the local wisdom of the Tengger people, the application of village-based disaster mitigation becomes more relevant and effective in maintaining community safety and sustainability. Local wisdom can be a valuable asset in dealing with the risk of natural disasters and the importance of supporting a collaborative approach between the government and the community in reducing the risk of an eruption of Mount Bromo. In particular, in this study, it is known that local wisdom has the most significant impact on the Tengger people in all preparedness actions, especially in evacuation to temporary shelters.

## CHAPTER 8. INCREASING VILLAGE CAPACITY IN FACING NATURAL DISASTERS

Increasing village capacity is an important issue in the context of development and empowerment of village communities. Village capacity refers to the ability of village communities to overcome challenges, manage resources, and develop their potential. Capacity building relates to the ability of villages and rural communities to act in reducing the hazard and damage caused by a disaster. Increasing the capacity of village communities in dealing with natural disasters is important to study. The limited capacity of rural communities in dealing with disasters can occur due to limited human resources with disaster knowledge, limited access to education, limited technology and information, limited economic resources, small population, lack of basic infrastructure, poverty and social inequality, limited access towards health facilities, gender inequality, geographical isolation, conflict and violence, and lack of community awareness and involvement.

This chapter aims to discuss increasing village capacity in dealing with natural disasters. This capacity building is related to the involvement of village communities in it. Community-based disaster management is one of the organised efforts made by community members before, during and after a disaster occurs to prevent, reduce, avoid and recover from the effects of natural disasters. This chapter presents an introduction, creating a disaster-resilient village, disaster education as a community capacity building tool, case studies of local knowledge and disaster management, developing disaster education programs, integrating local knowledge with modern science, increasing the capacity of village apparatus in disaster management, overcoming challenges in disaster preparedness, as well as monitoring and evaluating community capacity building.

With the study of the capacity of village communities to be involved in disaster management, it is hoped that it will provide many important benefits and expectations in

the context of disaster risk reduction, especially for village communities. Studying the capacity of village communities in the context of disaster management not only helps communities to be better prepared for disasters, but also provides long-term benefits in reducing disaster risk and improving people's welfare.

## CHAPTER 9. ECONOMIC AND SOCIAL SUSTAINABILITY IN VILLAGE AREA PLANNING

One of the issues in village regional planning is often related to sustainable development. In rural development planning it is important to consider social and economic development as it will be related to the economic base in the village. This chapter discusses the elements of economic and social development, especially those related to sustainable development. The development of economic and social sustainability includes several things such as marketing, village potential, public services, and accelerated access, which can be used to develop socioeconomics in rural areas.

Economic and social sustainability in rural areas aims to continuously improve the welfare and standard of living in village communities, such as creating new jobs, encouraging the development of economic activities, managing existing resources, preserving the natural environment in villages, and so on. The implementation of sustainable development in rural areas is supported by high community participation, thereby making it easier for village communities to realise sustainable development goals and it is hoped that the community will also feel the benefits.

This chapter provides an introduction, understanding sustainable development in rural areas, economic development in village area planning, justice and social welfare in village area planning, environmental sustainability in village area planning, village economic development and community welfare, partnerships with the private sector for economic growth, monitoring and evaluating sustainable development, case studies of successful sustainable village area planning, and overcoming economic and social sustainability challenges. By studying economic and social sustainability in village area planning in this chapter, it is hoped that sustainable rural development can be realised and that a number of positive changes will occur. Further study of economic and social sustainability in village area planning is not only about economic development, but also about community welfare, environmental preservation and social inclusion. This creates a strong foundation for sustainable rural development and improves the quality of life of rural communities.

## CHAPTER 10. COMMUNITY PREPAREDNESS IN FACING NATURAL DISASTERS

Natural disasters occur as one of the natural events or occurrences and cause damage, destruction, or negative impacts to humans, the environment and natural resources. Communities prepared for natural disasters have the ability to reduce human and economic losses and accelerate recovery. The concept of disaster management includes a series of efforts that include pre- and post-disaster disaster risk reduction. This is a holistic approach to reducing the impact of natural disasters.

The concept of community preparedness is a key factor in disaster management. This preparedness includes the knowledge, skills, planning, and actions taken by the community to deal with natural disasters. In line with this, this chapter aims to discuss community preparedness in dealing with natural disasters. The importance of community preparedness lies in its impact which can reduce losses from the negative impacts of disasters. The emphasis is on preparedness for natural disasters, namely the ability to carry out preparatory actions to face disaster emergencies quickly and

appropriately, covering aspects that are important to ensure that society can respond effectively when a disaster occurs.

This chapter presents an introduction, local wisdom in disaster mitigation, culture of preparedness in local communities, traditional practices and architecture for disaster resilience, embracing modern technology in disaster management, technology as an information catalyst for preparedness, strengthening community response and recovery efforts, post-disaster recovery and rehabilitation, monitoring and evaluation of community preparedness, and case studies of successful community preparedness.

It is hoped that the study of community preparedness in facing natural disasters in this chapter will be a useful step in reducing the risk and impact of natural disasters. so that society will be better prepared, more resilient, and better able to face disasters, which in the end can protect lives, property, and community welfare.

**CHAPTER 11. SUSTAINABILITY THROUGH AGRICULTURAL EXTENSION SERVICES**

Many nations and academics have praised the contributions that extension services have made to the development of sustainable agriculture over the years. This review study is aimed to investigate the viability of extension services, as well as the ability and capacity of extension workers to lead these services for smallholder farmers in developing nations. The findings indicate that extension workers must possess a wide range of skills to impart knowledge to farmers living in traditional settings, tainted by cultural norms that hinder their adoption. The findings also identified that business skills for facilitation, including group mobilisation, market engagement and linkages, systemic adaptability, shared leadership, effective communication, and active listening, play a crucial role in advancing the sustainable adoption of technologies and services among smallholder farmers.

The study revealed that traditional cultural learning methods such as role-playing, Socratic Dialogue discourse, field days, and access to the Internet of Things (IoT) through digitisation, are equally crucial for the long-term expansion of knowledge in the extended ecosystem. Further investigation reveals that there are numerous combinations of skills and tools that an extension worker may possess, depending on the geography, demographics, and rate of growth of the farming community they are interacting with. This study contributes to the global discussion on the importance of extension services and extension workers for the sustainable development of agriculture.

# CHAPTER 2: INTRODUCTION OF SUSTAINABLE REGIONAL AND VILLAGE PLANNING

***Authors: Gunawan Prayitno, Agus Dwi Wicaksono, and Aris Subagiyo***

## Abstract

In this chapter, we introduce the basics of sustainable regional planning and rural development. The meaning and importance of planning in the development context is explained. In this context, understanding regional planning, outlining the objectives and steps of regional planning, as well as the importance of predicting future scenarios and determining appropriate activity locations. This chapter explains various aspects of regional planning, including regional planning for social studies, regional planning for spatial planning or land use, as well as spatial planning at national, provincial and city levels. This chapter also highlights the challenges of globalisation and natural resource inequality. Discussion of how regional planning can help maintain a balance between development policies and natural resource management, as well as integration of various resource uses for sustainable development. The discussion also emphasised the importance of sustainable rural development and that the orientation of rural development must be towards sustainability, outlined the concept of sustainable villages, and underlined the importance of cooperation in sustainable village development. This chapter provides in-depth insight into the basics of sustainable regional planning and rural development, and how this can play a role in achieving sustainable development goals.

**Keywords:** planning, development, sustainable, aspects

## 2.1 Definition and Importance of Planning

There are several perspectives or points of view regarding the definition and meaning of a plan. The Directorate General of Human Settlement, Ministry of Public Works, and IAP states that planning is a systematic and orderly arrangement of steps that are useful for achieving goals or solving problems, whether in graphic or visual form or pictures of buildings and their environment, or can also be verbal in the form of a series of words. According to Conyers and Hills (2004), planning is an ongoing process consisting of decisions or choices from various ways to use existing resources to achieve specific goals in the future (Mulawati, 2019). In addition, Siagian (2008) also provides an opinion regarding the definition of planning, which is the whole process of thinking and carefully determining things to be done in the future to achieve predetermined goals (Fikri et al., 2015). The definition of a plan itself has undergone many developments and is not limited to one perspective. Holden (1970) states that the development of the meaning of planning for humans has a close relationship with the development of civilisation and technology because the development of human society influences the complexity of the problems faced in planning (Saraswati, 2006). The essence of a plan is a decision-making tool because planning is built on specific missions and goals for further study and determination of problem-solving options in the form of a strategy and used as a policy in planning implementation (Taufiq et al., 2019a). As for the procedural theory that defines planning as the right tools and methods in decision-making, planning

*Gunawan Prayitno*, Agus Dwi Wicaksono, and Aris Subagiyo*
**email: gunawan_p@ub.ac.id*
https://doi.org/10.11594/futscipress28

consists of several forms, namely synoptic planning, incremental, *mix-scanning*, reflective practice, advocacy planning, and transactive planning (Taufiq et al., 2019b).

Planning is carried out to achieve a goal and solve a problem. In completing the planning objectives, an assessment and determination of problem-solving options will be carried out later in the form of a strategy that will be used as a policy in planning implementation (Taufiq et al., 2019b). According to Azwar (1998), the planning objectives are as follows (Putri, 2018).

a. Assist executors in carrying out programs with good planning so that each executor will understand the plan and will stimulate executors to be able to carry out their respective duties as well as possible.
b. Encouraging implementers to help plan for the future so that the results of the current plan can be used as a guide for preparing work plans for the future and so on.
c. As an effort to regulate, both in terms of time, energy, facilities, costs, goals, locations, and the type of implementation organisation.
d. To obtain support, either in the form of legislative support (through regulations or laws), moral support (community approval, or material and financial support (usually from sponsors).

# 2.2 Understanding Regional Planning

## 2.2.1 Purpose and Steps of Regional Planning

Generally, regional planning aims to create an efficient, comfortable, and sustainable life for residents. The regional plan culminates in the activities planned by the government or private sector across the region. The selected regional location offers the highest level of efficiency and environmental suitability, considering any conflict of interest of the various parties (Tarigan, 2009). Regional planning also seeks to achieve goals that are of interest from multiple perspectives (Mulyanto, 2018):

a. Social - guarantees the fulfilment of needs, employment, and infrastructure. Thereby improving the quality of life and social welfare.
b. Economic - efforts to maintain and encourage economic growth and development to ensure sustainability and increase the standard of living.,
c. Environmental - preventing environmental damage and maintaining its balance.

Regional development planning is a development plan applied to the region. Regional planning refers to "where" a development will occur or be located. In development planning, it is not enough to determine "what" will be built but also "where" the development will be carried out. Regional planning becomes critical in terms of where development will take place as countries or regions are heterogeneous. The level of development of one region will differ from other regions. This development differs in economic, population, and physical development, such as land use and infrastructure development. The impact of the construction of a development project in one area differs from its placement in another area because of the differing regional characteristics.

In the modern paradigm, regional planning is seen as a systematic study of physical, economic, social, institutional, and political aspects. The study of these aspects aims to support and guide the use of resources in choosing the best way to increase productivity to sustainably meet community (public) needs (Tomaney et al., 2019). The main objective of regional planning is to produce the best possible use and achieve efficiency, equity, and community acceptance and sustainability (Lubis, 2021).

Regional planning refers to the specific development steps carried out by the region, wherein the land allocated is the planning region. These steps include planning development goals, predicting future events in an area, and determining its location by anticipating various problems that may arise during the development process. Planning Field Coverage Region Activities included in the planning region can be broad or relatively narrow, from macro-regional to certain activities at a specific location only (Tarigan, 2009). Regional planning in Indonesia requires elements whose sequence/steps include (Tarigan, 2009):

a. Recognising existing conditions and issues (in the short, medium, and long term) to identify the existing condition and any difficulties that may occur, data (primary and secondary data) must be collected in advance.
b. Defining the overall vision, mission, and objectives.
c. Identify current or possible future barriers and limitations.
d. Projects various related variables that are controllable and beyond the control of the designer.
e. Establishing goals that are expected to be achieved within a specific time frame (in the form of measurable goals).
f. Identifying and evaluating various alternatives to achieve the goal (taking into account the limited means and factors of production available).
g. Choosing the best alternative, including identifying various supporting activities to be carried out.
h. Determining the location of various activities to be carried out.
i. Establish policies and strategies to ensure that activities in each location run as expected.

### 2.2.2 Forecasting Future Scenarios

Scenario planning can also be used to develop innovation strategies related to sustainability and primarily regional development. This is important because, in reality, many actors encourage innovation and entrepreneurship. Understanding the role of each region is essential when developing economic growth policies. Scenario planning in producing policy documents is well known (Edgar et al., 2013). While accepting the reality of the high level of planning uncertainty in a region, starting from the desire to use an information-based perspective, using a scenario planning approach in development areas to implement knowledge-based local economic development policies, strategic planning must become a tool like scenario planning. In addition, scenario planning requires relatively complex data and information support (Oswar, 2023). According to Edgar (2013), there are at least 5 (five) difficulties in using scenario planning in regional development:

a. Understand the driving force.
   The factors influencing decision-making in developing regions are complex. The main challenge is understanding the Indonesian region's social, economic, and political conditions.
b. Complete various stakeholder roles.
   Planners need to have a good understanding of these different roles and their, at times, conflicting motivations. The success of scenario planning depends on the planner's ability to understand the stakeholders' motivations.
c. Coordinate the impact of different stakeholders.

From various stakeholders, the results of scenarios can sometimes conflict with or contradict each other. Therefore, coordination between stakeholders is required.

d. Understand and resolve conflicts of interest of stakeholders.
   Good scenario planning requires the planner to consider the conflict of interest of various parties. For planners, a vision and perception of a clear strategy for dealing with conflicts of interest is a must to achieve successful scenario planning.
e. Make policy recommendations based on scenario planning.
   The final challenge in scenario planning is formulating sound policy recommendations and achieving the desired results. This is the main reason for carrying out scenario planning in uncertain situations.

### 2.2.3 Designating Activity Locations

According to Tarigan (2009) a location can be used for various activities; determining specific activities in a location must provide maximum added value to the community. The placement and allotment of the location must guarantee harmony in inter-sectoral spatial planning, optimise investment, create efficiency in people's lives, and ensure environmental sustainability. Determining the location of activities in the planning area is a necessary process that requires careful thought and in-depth analysis. These steps aim to identify the most suitable areas or locations for different activities.

The process begins with identifying regional development needs and objectives. Once objectives and needs have been clarified, the next step is to evaluate relevant location factors. These factors help determine whether a location is suitable for a particular activity. The mapping and analysis process is an essential step in selecting activity areas. Geospatial data and other information are used to map areas and identify potential areas. Community participation and participation of related stakeholders is also carried out at this stage. Their input is invaluable because it allows for a broader and more diverse perspective.

In addition, an in-depth environmental and social compatibility analysis was carried out. This includes assessing how the planned activities will impact the local area and community. Elements such as air quality, water, noise, and impact on social welfare are evaluated. Ultimately, selecting the best location is based on broad considerations, including long-term benefits and possible risks. The main objective is to ensure that the selected site can support the planned activities efficiently and sustainably. The final step is integrating the designated locations into the regional planning plan. The plan must ensure that the location of operations is consistent with the overall area plan objectives and strategy.

## 2.3 Various Aspects of Regional Planning

### 2.3.1 Regional Planning for Social Studies

Sustainable planned development will also have a social aspect. Failure to implement development policies in the past is still considered the weakest link in the government system that requires attention in terms of development and poverty. One reason is the weak participation of the community in development is caused by internal factors (within the community itself) and external factors (outside the community), and these factors do not allow the community to participate in development (Situmorang et al., 2021). Development programs based on community participation are, of course, based on the needs and demands of the community, thus enabling the program to be adequately

implemented in line with development objectives for the benefit of the community. To overcome the weakness of community participation in village development, the concept of "empowerment" is required as a means of promoting community participation in development (Rahman, 2016).

In the social context, empowerment is the ability of individuals to integrate into society and build empowerment of affected communities (Wance et al., 2020). Community empowerment is an effort to empower groups of people who live in poverty to escape the trap of poverty and underdevelopment (Arfianto & Balahmar, 2014). Community empowerment is a process of growing and developing community capacity to be involved in various aspects of development in an area. Empowerment can lift people from disadvantage and poverty to compete with the outside world (Hapsari et al., 2018).

As development agents, the community should actively participate in the development process. The community's active role can be realised through various forms of community involvement or participation in the development process, both at the stages of evaluation, planning, implementation, and maintenance and at all stages of the development process (Kushadajani & Permana, 2020). The main goal is not only to overcome problems related to economic income but also to provide opportunities for people to meet their physical, economic, and social needs, such as increasing self-confidence, participating in social activities, and being independent in fulfilling life tasks (Lubis, 2021).

### 2.3.2 Regional Planning for Spatial Planning or Land Use

Rencana Tata Ruang Wilayah (RTRW)/The Regional Spatial Plan is a strategic document that outlines the spatial organisation and development of a specific region. It serves as a guideline for land use, infrastructure development, and environmental conservation within the region. The RTRW aims to promote sustainable development, optimise resource allocation, and ensure the efficient utilisation of land and space. It is a crucial tool for the concept of "national" as it pertains to a set of principles and approaches that govern the formulation and implementation of policies and strategies concerning the utilisation of space under a nation's jurisdiction. A territory can be defined as a geographical entity, including a specific region with delineated boundaries and organised systems, which are established based on administrative and functional considerations. It comprises various interconnected elements that are associated with the territory. As per legal provisions, the National Territory denotes the unified state of the Republic of Indonesia, encompassing the terrestrial expanse, maritime domain, and airspace, inclusive of global territories.

The National Regional Spatial Planning, the RTRW, serves as a framework for formulating national development plans with a focus on long and medium-term objectives. The application of the National RTRW is also required for provincial and district/city spatial areas, which involves determining the location and function of the region for investment and spatial planning of national strategic areas. The spatial planning region encompasses the utilisation of land, sea, and air space at the national level, which is subject to regulation within the framework of the unitary state of the Republic of Indonesia. This includes the management of subterranean space, which is essential for maintaining the functionality of space and preventing adverse environmental effects, as well as ensuring national defense and security.

The National RTRW has been subject to government regulation for a period of two decades. The National RTRW serves as a crucial point of reference for governmental

organisations at the central, regional, and municipal levels, aiding in the identification of areas and appropriate uses within spatial development projects.

### 2.3.3 National-level Spatial Planning

The process of preparing the Provincial Spatial Planning, also known as Rencana Tata Ruang Wilayah (RTRW), involves the consideration of various factors, including the National RTRW, standards for spatial planning, and regional long-term development plans. The determination of the Provincial RTRW is contingent upon adherence to state regulations over a span of two decades. The formulation of the Provincial Spatial Planning necessitates consideration of several factors, including: 1) the findings of research on national development issues and the consequences of provincial spatial planning; 2) the allocation of development resources and economic progress across provinces; 3) the synchronisation of development endeavors between provinces and districts/cities; 4) the evaluation of environmental repercussions and capacity; 5) the long-term development blueprint for the region; 6) the spatial plans of adjacent provinces; 7) the strategic spatial planning for designated areas within the province; and 8) the spatial plans of individual regencies and cities.

The Provincial RTRW contains objectives, guidelines, and spatial planning strategies. The District Provincial Spatial planning guidelines and strategies include the development of provincial spatial planning structures and spatial planning patterns. In the spatial plan, the region province is described in the urban region and the laying of infrastructure networks, which according to laws and regulations, the development and management of is the authority of the provincial regional government. The regional government focus their attention on the spatial structure, stipulated in the National Spatial Layout Regional Plan.

The Provincial RTRW is a reference for local government agencies and city governments to control the location and use of land in preparing development programs regarding land use in the area concerned. In addition, the floor plan is the basis for determining the room's directions.

### 2.3.4 Provincial-level Spatial Planning

Rencana Tata Ruang Wilayah (RTRW)/ Spatial Plan Region Regency, provides the basis for issuing location permits for development and property management. Period Spatial Plan Region (RTRW) Regency is for a 20 (twenty) year period. Regional Spatial Planning provides: 1) objectives, policies, and strategies for spatial planning for regional administration; 2) Spatial planning zones, covering urban system zones and infrastructure network system zones related to rural areas; 3) Model spatial plan for the Naiplik district area, including the Naiplik Conservation Area and the Naiplik Plantation Area; 4) Identification of district strategic areas; 5) directions for the utilisation of space-regional zones, containing details of the five-year medium-term main program; and 6) Land Use Control Provisions, which include general zoning provisions, permit provisions, incentive and prevention provisions, as well as law enforcement policies.

Within the designated spatial planning region, the district can be characterised as a centralised framework of interactions among many districts and the establishment of infrastructure networks within a specific geographical area. The development and management of the subject in question are under the jurisdiction of the regency regional government, as stipulated by relevant laws and regulations. In order to prepare the district spatial layout plan, it is important to consult the national, regional spatial layout

plan, as well as the province regional spatial layout plan. Furthermore, the establishment of regional management spatial planning relies on the presence of guidelines and instructions for executing regional long-term planning, in addition to spatial planning.

When formulating district spatial plans, it is imperative for stakeholders, particularly local governments, to take into account a multitude of factors pertaining to individuals' well-being, encompassing physical, environmental, and other dimensions. The spatial plan region refers to a designated geographic area that is subject to a specific plan or framework aimed at guiding and managing its development and land use. The district serves as a framework for local governments to ascertain the allocation of development activities in spatial utilisation and the formulation of development programs pertaining to spatial use within the region. Additionally, it serves as a foundation for offering recommendations on spatial utilisation directions, ensuring that the implementation of development aligns with the spatial plan consistently. The term "region regency" refers to a specific administrative division within a larger geographical area.

### 2.3.5 District or City-level Spatial Planning

Rencana Tata Ruang Kawasan (RTRW)/ Rural Area Spatial Plan (RTRW) is part of the Regency RTRW, which can be designed as a land use tool for optimising agricultural activities, which can be in the form of agricultural policy areas. Village spatial planning is still new, so the implementation procedures need to be understood. Village managers have not felt the benefits because there is no socialisation and guidance regarding the importance of village spatial planning. Previous village development plans were based on something other than spatial use and therefore required adjustment to address existing potentials and problems. The implementation of village development is the responsibility of the village, and village spatial planning issues must be considered as part of the task of regulating and controlling land use, which is the responsibility of the village government.

Village spatial planning is essential for the village development planning process: 1) become the basis for preparing the Village RPJM. Without a village spatial plan, there is no guarantee that the village will have a sound and sustainable Village RPJM. As a result, the village will face various problems such as damage to the environment and natural resources; 2) can increase various conflicts of interest both between villages and residents, as well as with other parties who have an interest in controlling the potential in their area. These conflicts often harm many parties and can also harm the environment; 3) So far, the RTRW has only been prepared by the District Government, dividing it only between rural areas and urban areas, which have yet to reach rural area units. Village spatial planning must be done at the minor district level, namely sub-district villages, to provide transparency and control over higher government authority. Village spatial planning is a positive intervention to carry out development in the village, improve the quality of the environment, and bring a sense of security to the community (Rohiani, 2021).

## 2.4. Addressing Globalisation and Natural Resource Inequality

### 2.4.1 Balancing Development Policies with Resource Management

Globalisation can be defined as the process of entry into the scope of the world (Nurhaidah & Musa, 2015a). On the other hand, Grew in Nikolopoulou (2010) defines globalisation as stretching social, political, and economic activities across borders so that events, decisions, and activities in a place or region have significance for society (Lestari,

2018). This globalisation touches all essential aspects of life. It creates new challenges and problems that must be answered and solved as a form of effort to take advantage of globalisation to benefit people's lives (Nurhaidah & Musa, 2015b). The process of globalisation development was initially marked by advances in the field of information and communication technology (Nurhaidah & Musa, 2015b). The progress of this field then influences other sectors in life, such as the political, economic, social, cultural, and others. Along with the development of technology, industrialisation will also develop rapidly. Rapid growth also followed the development of this industry in the need for natural resources and irrational use, resulting in an increasingly large scale of exploitation (Liu et al., 2023a; Siankwilimba et al., 2023).

Natural resource management is essential for economic sustainability and stability. If this exploitation continues, it will lead to a scarcity of natural resources, thereby affecting development, especially in areas that are economically dependent on natural resources. Therefore, it is essential to have support from the government to make policies that consider environmental aspects and the protection of natural resources. Policy formulation and establishment must motivate society to support environmentally friendly goods and services provided by the government and the private sector to help separate human well-being from resource use (Langnel et al., 2021). An example of a policy that can be applied to support sustainable development to manage natural resources efficiently is the policy implemented by the Chinese government. Recently, the Chinese government has pushed for green fiscal policies to reduce the wastage of resources by providing green and clean infrastructure, encouraging technology development and talent development, and implementing preferential policies (Liu et al., 2023b).

### 2.4.2 Integration of Multiple Uses for Sustainable Development

According to Brundtland (1987), sustainable development can be defined as development that aims to meet present human needs without compromising the ability of future generations to meet their needs (Vilarinho et al., 2023a). In this regard, the Indonesian government has committed to successfully implementing the sustainable development goals (sustainable development goals) as an agenda for achieving development in 2030. The Sustainable Development Goals (SDGs) are a global action plan agreed upon by world leaders, including Indonesia, to end poverty, reduce inequality and protect the environment. The SDGs contain 17 Goals and 169 Targets expected to be achieved by 2030 (Linggarwati et al., 2021a).

The SDGs have three main pillars, namely (Alawiyah & Setiawan, 2021a):

a. Human development covering the health and education sectors.
b. Socio-economic environment development, which includes economic growth and the availability of environmental infrastructure.
c. Environmental development, which includes the quality of a healthy environment and the availability of natural resources.

The three pillars above are integrated and influence each other to achieve sustainable development. The integration of the three can be illustrated in the phenomenon when poverty can lead to a generation that is malnourished and susceptible to disease because people experiencing poverty tend not to be able to access health services quickly or access education. In addition, the low level of education in people with low incomes (poor) can also be caused by a lack of time, because most of their time will be devoted to working, managing resources, or other activities to increase income. Therefore,

policymakers must consider educational development and poverty levels when formulating policies to improve public health. In addition, regional policies must be formulated based on local conditions. For example, conditions where women and children have the main task of collecting traditional fuel sources, such as twigs and leaves so that their time is allocated primarily for these activities and there is no time for education. In overcoming this, the government must initiate programs that allow these communities to have higher quality access to enable them to devote more time to childcare and education (Niu et al., 2023)

## 2.5 Emphasising Sustainable Village Development

### 2.5.1 Orienting Village Development Towards Sustainability

Villages have the potential to develop natural, physical, social, demographic, and cultural resources that have yet to be utilised optimally. This is one of the causes of development in several villages being hampered. Sustainable village development is indispensable for improving villagers' welfare and quality of life (Mujio et al., 2023). Villages must adapt to keep up with these technological advances to be involved in all fields (Purnamawati et al., 2023). The manifestation of implementing village development towards sustainability is ensuring that the growth and development of villages is balanced between current needs and the ability to meet the needs of future generations. This concept is often known as sustainable development. Sustainable village development considers the environmental impact of every decision and action taken in the development process. Village development is based on the potential of natural resources, humans, economy, society, and community culture. Efforts that can be made in the village development framework towards sustainability are empowering the local economy, creating local transportation access to growth areas, and accelerating the fulfillment of basic infrastructure (Mujio et al., 2023).

### 2.5.2 The Concept of a Sustainable Village

The notion of a sustainable village prioritises the achievement of a harmonious equilibrium among social, economic, and environmental aspects of development, with the aim of fulfilling the requirements of the present generation while safeguarding the potential of future generations. The interrelated basic challenges for the sustainable development of human settlements, including cities, towns, and villages, are encompassed within the seventeen Sustainable Development Goals (SDGs). These goals, as identified by (Del Mar & García, 2017), prioritise inclusion, security, production, and consumption. The sustainable rural development strategy encompasses a comprehensive framework that aims to fulfil the fundamental daily requirements of those residing in rural areas. This is achieved through the provision of public utilities, which are underpinned by technical, socio-economic, and environmental factors (Mihai et al., 2020). The primary objective of village development is to enhance the well-being and quality of life of rural inhabitants while addressing poverty through the fulfilment of fundamental necessities, establishment of village amenities and infrastructure, exploration of local economic capacities, and the sustainable utilisation of natural resources and the environment (Mujio et al., 2023). Similar to the concept of a smart city, the establishment of an intelligent village necessitates the incorporation of digital technology pertaining to rural infrastructure in developing nations, the generation and

utilisation of locally sourced electrical energy, and the implementation of information technology for agricultural management (Vaishar & Šťastná, 2019).

### 2.5.3 Collaboration for Sustainable Village Development

Close cooperation between the central and regional governments is essential in various development and management aspects. This is evidenced by the synergy between the two levels of government that can produce more significant benefits for society and national development. One of the main reasons for this cooperation is that the development programs and policies made by the central government can be implemented effectively at the local level. Central and regional governments have a role in implementing environmental monitoring (Sun et al., 2021). Local governments have a deeper understanding of local needs and characteristics, so they can make more appropriate adjustments to make these programs more relevant and beneficial to local communities.

Problems in the environment are included in the management of public goods which need supervision from the government. However, local governments give priority to economic development which results in the emergence of serious environmental problems. Therefore, the central government is vital in the environmental management system. Local governments are responsible for environmental management, and the central government oversees its implementation (Sun et al., 2021). Good coordination between the central and local governments can ensure a holistic and coordinated handling of these issues. Good cooperation can create a more significant positive impact on society's welfare and the nation's development as a whole.

## 2.6 Conclusion

In the context of sustainable regional and village planning, a deep understanding of the essence of planning becomes essential. Planning is not only about making decisions but also about formulating goals that support problem-solving efforts. In carrying out regional planning, attention to the steps taken to achieve planning objectives is crucial. This step involves being able to foresee potential future problems and anticipate them. For example, through regional planning for social studies, we can identify community needs that must be prioritised in regional development. Meanwhile, in economic planning, focus can be given to improving community welfare in urban and rural areas. In the context of regional planning, it is also essential to recognise the role of globalisation and natural resource inequality. Formulating development policies that align with natural resource management can help prevent environmental damage and reduce the negative impacts of globalisation. The development of rural areas is also essential in achieving a balance of sustainable development. Asset management and empowerment of rural communities help to create a more equitable economic sustainability. However, sustainable planning is more comprehensive than just the regional scale. When involving villages, planning must consider the diversity of resource management patterns. To become a sustainable village, maintaining environmental harmony and ecosystem balance is a foundation that must be addressed. Wise planning must be able to direct village development towards sustainability, taking into account current needs without sacrificing the future.

# References


Alawiyah, T., & Setiawan, F. (2021). Pengentasan Kemiskinan Berbasis Kearifan Lokal pada Masyarakat Desa Pemerintah telah mengimplementasikan Millenium Development Goals ( MDGs ) hingga Sustainable Development Goals ( SDGs ) dalam. *Jurnal Sosiologi Usk (Media Pemikiran & Aplikasi)*, *15*(2), 131–154.

Arfianto, A. E. W., & Balahmar, A. R. U. (2014). Pemberdayaan Masyarakat dalam Pembangunan Ekonomi Desa. *JKMP (Jurnal Kebijakan Dan Manajemen Publik)*, *2*(1). https://doi.org/10.21070/jkmp.v2i1.408

Ayu Purnamawati, I. G., Yuniarta, G. A., & Jie, F. (2023). Strengthening the role of corporate social responsibility in the dimensions of sustainable village economic development. *Heliyon*, *9*(4). https://doi.org/10.1016/j.heliyon.2023.e15115

Del Mar, M., & García, H. (2017). *Las ciudades como objetivo de desarrollo sostenible*.

Edgar, B., Abouzeedan, A., Hedner, T., Maack, K., & Lundqvist, M. (2013). Using scenario planning in regional development context: the challenges and opportunities. *World Journal of Science, Technology and Sustainable Development*, *10*(2). https://doi.org/10.1108/20425941311323118

Fikri, R., Nurpratiwi, R., & Saleh, C. (2015). Perencanaan Pembangunan Daerah Dalam Penanggulangan Kemiskinan. *Jurnal Reformasi*, *5*(2), 60–65.

Hapsari, D. R., Sarwono, B. K., & Eriyanto, E. (2018). Jaringan Komunikasi Dalam Partisipasi Gerakan Sosial Lingkungan: Studi Pengaruh Sentralitas Jaringan terhadap Partisipasi Gerakan Sosial Tolak Pabrik Semen Pada Komunitas Adat Samin di Pati Jawa Tengah. *Jurnal Komunikasi Indonesia*, *6*(2). https://doi.org/10.7454/jki.v6i2.8712

Kushadajani, K., & Permana, I. A. (2020). Inovasi Pemberdayaan Masyarakat Desa: Peran Kepemimpinan Lokal dalam Perspektif Relasi Antar Aktor. *JIIP: Jurnal Ilmiah Ilmu Pemerintahan*, *5*(1). https://doi.org/10.14710/jiip.v5i1.7318

Langnel, Z., Amegavi, G. B., Donkor, P., & Mensah, J. K. (2021). Income inequality, human capital, natural resource abundance, and ecological footprint in ECOWAS member countries. *Resources Policy*, *74*(October 2020), 102255. https://doi.org/10.1016/j.resourpol.2021.102255

Lestari, S. (2018). Peran Teknologi dalam Pendidikan di Era Globalisasi. *Edureligia; Jurnal Pendidikan Agama Islam*, *2*(2), 94–100. https://doi.org/10.33650/edureligia.v2i2.459

Linggarwati, T., Haryanto, A., Miryanti, R., & Darmawan, A. B. (2021). IMPLEMENTASI SDGs DI DESA PANDAK, KECAMATAN BATURRADEN, KABUPATEN BANYUMAS. *Pengembangan Sumber Daya Perdesaan Dan Kearifan Lokal Berkelanjutan XI*, 361–368.

Liu, Z., Li, R., Cai, R., & Lan, J. (2023a). A nexus of income inequality and natural resource utilization efficiency: Effect on the road to green economic recovery. *Resources Policy*, *85*(PA), 103625. https://doi.org/10.1016/j.resourpol.2023.103625

Liu, Z., Li, R., Cai, R., & Lan, J. (2023b). A nexus of income inequality and natural resource utilization efficiency: Effect on the road to green economic recovery. *Resources Policy*, *85*(PA), 103625. https://doi.org/10.1016/j.resourpol.2023.103625

Lubis, M. S. (2021). *Perencanaan Wilayah Untuk Mendukung Konsep Berkesinambungan" Sustainability Development*. Media Sains Indonesia.

Mihai, F.-C., Iatu, C., Mihai, F.-C., & Iatu, C. (2020). Sustainable Rural Development under Agenda 2030. *Sustainability Assessment at the 21st Century [Working Title]*. https://doi.org/10.5772/INTECHOPEN.90161

Mujio, Rahayu, R. A., Waskitaningsih, N., & Mulyadi, E. (2023). Village Development Sustainability Analysis: A Case Study in Cijeruk, Bogor Regency. *The Journal of Indonesia Sustainable Development Planning*, *4*(1), 57–68. https://doi.org/10.46456/jisdep.v4i1.413

Mulawati, A. H. (2019). *Integrasi Sistem Perencanaan Partisipatif, Teknokratif, dan Politis dalam Perencanaan dan Penganggaran Program Pemberdayaan Ekonomi Masyarakat Kota*. Ejurnal. Ipdn. Ac. Id. https://ejournal. ipdn. ac. id/JMP/article/view/190/116.

Mulyanto. (2018). *Prinsip-Prinsip Pengembangan Wilayah / Mulyanto*. Suluh Media.

Niu, S., Chen, Y., Zhang, R., Luo, R., & Feng, Y. (2023). Identifying and assessing the global causality among energy poverty, educational development, and public health from a novel perspective of natural resource policy optimization. *Resources Policy*, *83*(100), 103770. https://doi.org/10.1016/j.resourpol.2023.103770

Nurhaidah, & Musa, M. I. (2015a). Implementasi Metode Batu Pijar Dalam Pembelajaran Matematika Untuk Meningkatkan Aktifitas Dan Hasil Belajar Siswa Sd Negeri 47 Kota Jambi. *Jurnal Pesona Dasar*, *7*(2), 1–9. https://doi.org/10.24815/pear.v7i2.14753

Nurhaidah, & Musa, M. I. (2015b). Implementasi Metode Batu Pijar Dalam Pembelajaran Matematika Untuk Meningkatkan Aktifitas Dan Hasil Belajar Siswa Sd Negeri 47 Kota Jambi. *Jurnal Pesona Dasar*, *7*(2), 1–9. https://doi.org/10.24815/pear.v7i2.14753

Oswar, M. (2023). *Perencanaan Skenario (Scenario Planning). Konsep Dasar, Pembelajaran, dan Agenda Strategis Oswar Mungkasa*. Badan Perencanaan Pembangunan Nasional (Bappenas).

Putri, I. M. (2018). *Efektivitas Perencanaan dalam Pelaksanaan*.

Rahman, K. (2016). Pemberdayaan Partisipasi Masyarakat Dalam Pembangunan Desa. *Wedana: Jurnal Kajian Pemerintahan, Politik Dan Birokrasi*, *2*(2).

Rohiani, A. (2021). Perencanaan Penataan Ruang Desa Berbasis Potensi Desa sebagai Kendali Pembangunan Desa yang Terarah dan Berkelanjutan. *Journal of Regional and Rural Development Planning (Jurnal Perencanaan Pembangunan Wilayah Dan Perdesaan), 5(1), 15-27*.

Saraswati, S. (2006). Kearifan Budaya Lokal Dalam Persfektif Teori Perencanaan. *Jurnal Perencanaan Wilayah Dan Kota UNISBA*, *6*(2).

Siankwilimba, E., Hiddlestone-Mumford, J., Hoque, E.-M., Hang'ombe, M. B., Chisoni, M., Hasimuna, O. J., Maulu, S., Mphande, J., Chibesa, M., Moono, M. B., Muhala, V., Cavaliere, L. P. L., Faccia, A., & Prayitno, G. (2023). Sustainability of Agriculture Extension Service in the Face of COVID-19 : A Study on Gender Market Systems. *Cogent Food & Agriculture*, 9(2), 25. https://doi.org/10.1080/23311932.2023.2284231

Situmorang, L. M., Widhy, L. R., & Indriastuty, P. D. (2021). Pemberdayaan Masyarakat di Indonesia Pada Masa Pandemi Covid-19. *Paper Knowledge . Toward a Media History of Documents*, *December*.

Sun, X., Wang, W., Pang, J., Liu, X., & Zhang, M. (2021). Study on the evolutionary game of central government and local governments under central environmental supervision system. *Journal of Cleaner Production*, *296*. https://doi.org/10.1016/j.jclepro.2021.126574

Tarigan, R. (2009). *Perencanaan Pembangunan Wilayah, Edisi II Cetakan IV (Edisi Revisi).* Bumi Aksara.

Taufiq, M., Suhirman, S., Sofhani, T. F., & Kombaitan, B. (2019a). Kajian Csr Melalui Sudut Pandang Perencanaan Transaktif: Studi Kasus Perencanaan Csr Di Indonesia. *Indonesian Journal Of Accounting And Governance*, *3*(2), 176–194.

Taufiq, M., Suhirman, S., Sofhani, T. F., & Kombaitan, B. (2019b). Kajian Csr Melalui Sudut Pandang Perencanaan Transaktif: Studi Kasus Perencanaan Csr Di Indonesia. *Indonesian Journal Of Accounting And Governance*, *3*(2), 176–194.

Tomaney, J., Krawchenko, T., & McDonald, C. (2019). Regional planning and rural development: Evidence from the OECD. In *The Routledge Companion to Rural Planning*. https://doi.org/10.4324/9781315102375

Vaishar, A., & Šťastná, M. (2019). Smart Village and Sustainability. Southern Moravia Case Study. *European Countryside*, *11*(4), 651–660. https://doi.org/10.2478/euco-2019-0036

Vilarinho, H., D'Inverno, G., Nóvoa, H., & Camanho, A. S. (2023). The measurement of asset management performance of water companies. *Socio-Economic Planning Sciences*, *87*(January). https://doi.org/10.1016/j.seps.2023.101545

Wance, M., Kaliky, P. I., & Syahidah, U. (2020). PKM Inovasi Pemberdayaan Masyarakat Dalam Perencanaan Pembangunan Desa Pasir Putih Kabupaten Halmahera Selatan. *Selaparang Jurnal Pengabdian Masyarakat Berkemajuan*, *3*(2). https://doi.org/10.31764/jpmb.v3i2.1771

# CHAPTER 3: SUSTAINABLE REGIONAL PLANNING FOR RURAL DEVELOPMENT

***Authors: Gunawan Prayitno, Enock Siankwilimba, and Jacqueline Hiddlestone-Mumford***

## Abstract

This chapter begins with an understanding of development planning and the main objectives in the Sustainable Development Goals (SDGs) which are the primary focus of sustainable rural development. We explain the legal basis for rural SDGs, such as Village Law Number 6 of 2014 and Permendesa PDTT No. 13 of 2020 which prioritises rural SDGs. Next, we compare the rural SDGs with the national SDGs and the Sustainable Development Goals (Global Goals). In detail, the main goals and targets of rural SDGs are detailed, which include economic empowerment, improving education, improving health and welfare, food security, promoting clean water and sanitation, and access to clean energy. The rural SDGs also emphasise the importance of sustainable economic growth, industrial and infrastructure development, as well as reducing inequality and promoting gender equality, the role of rural SDGs in overcoming climate change, preserving biodiversity, and increasing access to justice. In addition, the discussion emphasised the importance of collaboration and partnership in achieving sustainable rural development as well as recognising cultural and religious aspects in this process. Through this chapter, we gain an understanding of the role of sustainable regional planning in realising rural SDGs which are relevant and important for the future of rural development.

**Keywords:** SDGs, development, sustainable

## 3.I Introduction

Sustainable development is an agenda initiated in 2015 by the United Nations (UN) and its member countries to create economic growth in all countries. In addition, the Sustainable Development Goals (SDGs) aim to improve health and education, reduce inequality and tackle climate change. The goal of sustainable development is thus expected to be able to meet human needs and improve people's welfare and quality of life (Del Arco et al., 2021). These SDGs include 17 commitments. To date population growth in urban areas has experienced rapid growth. In 2030, it is estimated that 60% of the population will live in urban areas and be dominated by people living in developing countries because of better facilities and job opportunities. This will lead to problems such as public discomfort, decreased availability and pressure of clean water, increased waste generation, uncontrolled production, and excessive consumption patterns. Whereas, in rural areas the opposite will occur where the population living in the village will experience a population decline, so that rural depopulation will occur (Del Arco et al., 2021).

The existence of rural depopulation will affect the provision of services such as recreation, health, and education that are not functioning optimally (Del Arco et al., 2021). In addition to sustainable urban development and planning, it is also important to pay attention to rural residents to provide more adequate facilities and settlements so that the commitment to the SDGs becomes a policy that can become a reference for activities involving rural development. Even though the village is an area that has a

*Gunawan Prayitno*, Enock Siankwilimba, and Jacqueline Hiddlestone-Mumford*
**email: gunawan_p@ub.ac.id*
https://doi.org/10.11594/futscipress29

reasonably close relationship with SDGs, such as the dependence of rural communities on natural resources, it has been largely ignored in the context of sustainable development (Lowery et al., 2020). The reality is that areas with a natural resource base, such as rural areas, need to pay more attention to protecting workers and communities that depend on natural resources (Bammer, 2005). The link between the goals of sustainable development and the livelihoods of rural communities is in the livelihoods of people in the agricultural sector. The agricultural sector is critical in achieving the SDGs (Coulter, 1992).

## 3.2 Understanding Village Development Planning

The concept of integrated village development is one of the rural governance systems that is directly linked to the concept of spatial planning, the formation of a place, and the capacity building of a region (Shucksmith, 2010) is based on integrated rural development (???, 1981), which originated from the development concept of developing countries in the 1960s and 1970s. This was later adopted in the West Isles of Scotland and Nine rural areas in Europe as a pilot project of the integrated village development concept approach. Rural development planning is closely related to village community participation. Community participation has become the core of development in every country and is the main concept in shaping sustainable development (Swapan, 2014). According to Fung and Kennedy (2006); and Sheely (2015), in the late 1980s, many countries carried out reforms decentralising authority to local governments to form planning institutions that could involve the community in various aspects ranging from development programs, identification of policy issues, project selection, and activities in making budgets, as well as community participation for provision public service.

## 3.3 Introducing Village Sustainable Development Goals (SDGs)

### 3.3.1 Legal Basis for Village SDGs: Undang Undang Desa Nomor 6 Tahun 2014

In 2014, the Indonesian government enacted Law Number 6, commonly referred to as the Law About Villages. This legislation bestowed villages with a range of autonomous powers, enabling them to independently operate their respective government systems. This legislation grants rural communities the authority to enhance their level of engagement, particularly in the domains of village planning and development. This is consistent with the notion of community-based development that adopts a localised approach and is interwoven with the local culture (Damayanti & Syarifuddin, 2020). The village development paradigm has experienced a significant transformation, wherein the village has become the focal point, following the implementation of Law Number 6.

The Village Fund Program is an implementation of Law Number 6 of 2014, aimed at addressing the requirements of village communities in accordance with regional development priorities. The implementation of the village fund program is of paramount importance for several reasons. Indonesia, being a country with a significant population density, faces the challenge of addressing poverty, with approximately 10.14% of its population falling below the poverty line. The SDGs of the village encompass the role of sustainable development, which is a key focus area in the priority program for utilising Village Funds in 2021. These goals are guided by five fundamental principles, namely humanity, justice, variety, natural balance, and interests.

The execution of the village fund program indirectly contributes to the financing of the SDGs and their overall performance. The acceleration of village development, as facilitated by the regional development agenda, will have an impact on the attainment of the SDGs. These goals encompass various aspects such as poverty and hunger eradication in villages, promoting economic equity within villages, ensuring the well-being of villages in terms of health, environment, and education, creating towns that are conducive to women's empowerment, and fostering villages that are responsive to their cultural heritage.

### 3.3.2 Permendesa PDTT No. 13 of 2020: Focusing on Village SDGs

Law Number 6 of 2014 will make it easier for local governments to exercise their authority in developing regions and accelerate the achievement of the SDGs (Febriani & Samudra, 2023). As one of the efforts to achieve the SDGs down to the village level, the Ministry of Villages, Development of Disadvantaged Regions and Transmigration passed the Regulation of the Ministry of Villages, Development of Disadvantaged Regions and Transmigration (Kemendes PDTT) Number 13 of 2020 concerning Priority Use of Village Funds in 2021 which were directed towards accelerating the achievement Village SDGs.

Regulation of the Ministry of Villages, Development of Disadvantaged Regions and Transmigration (Kemendes PDTT) Number 13 of 2020 refers to Indonesian Presidential Regulation Number 59 of 2017 concerning the Implementation of Achieving Sustainable Development Goals related to sustainable national development by updating SDGs based on the Development Village Index (IDM).

### 3.3.3 Aligning and Comparison Village SDGs with National SDGs and Global Goals

The implementation of SDGs in Indonesia refers to Presidential Regulation Number 59 of 2017, which mandates the Ministry of National Development Planning to compile a road map for SDGs in Indonesia to be used as the primary reference in the National Medium Term Development Plan (RPJMN). However, there are limitations that the government has in prioritising this because the RPJMN is prepared based on regional issues regarding welfare and sovereignty. At the same time, the SDGs are centred on global issues of world sustainability. Even so, nine RPJMN goals are related to implementing the SDGs.

SDGs in village development have been adopted in development plans and those that have been implemented emphasise increasing economic welfare and expanding access to health, education and community services. There are 18 SDGs Sustainable Development Goals consisting of: (1) villages without poverty; (2) villages without hunger; (3) healthy and prosperous villages; (4) quality village education; (5) involvement of village women; (6) decent water and sanitation villages; (7) clean and renewable energy villages; (8) village economic growth is evenly distributed; (9) village infrastructure and innovation according to needs; (10) villages without gaps; (11) village residential areas are safe and comfortable; (12) environmentally conscious village consumption and production; (13) climate change responsive villages; (14) a village that cares about the marine environment; (15) villages that care about the land environment; (16) peaceful village with justice; (17) partnership for village development; and (18) dynamic institutions and adaptive village culture.

Several aspects of the Village SDGs can then answer global issues such as the Village SDGs (1) Village Without Poverty - this goal aligns with the SDGs, so that by 2030, no residents will be below the village's poverty line. To achieve this goal, policies need to be

taken and implemented jointly by both the central government and regional governments. Several things have been done by the government, such as the provision of Direct Cash Assistance (BLT).

## 3.4. Key Goals and Objectives of Village SDGs

In 2015, the United Nations (UN) introduced a new set of goals called Sustainable Development Goals (SDGs) as one of the efforts to reduce disparities between countries and improve the quality of human life (Permatasari et al., 2021c). Indonesia is one of the countries that has agreed on the SDGs program. This is also stated in Presidential Regulation 59 of 2017 concerning implementing the Achievement of Sustainable Development Goals. The SDGs themselves are a global development plan. They are a continuation of the Millennium Development Goals (MDGs), which consist of 17 goals and 169 interconnected, influential, inclusive, universal targets, and nothing is left behind (Manurung et al., 2022).

Indonesia as one of the countries that supports the SDGs program itself, consists of 17,000 islands and around 7,500 villages; so regionally it can be said that 91% of Indonesia's territory is rural areas (Sugandi et al., 2022a). Therefore, Indonesia contributes significantly to the achievement of the SDGs. Iskandar (2010) states that the achievement of the national SDGs shows that villages contribute 74% to the achievement of SDGs, even though, in reality, villages are not included in the list of national SDG action plans (Linggarwati et al., 2021b).

In response to this, in 2020, the Ministry of Villages formulated a series of goals that became a reference for village development in 2020–2024 which were called Village SDGs and were based on national SDG targets and global target localisation (Permatasari et al., 2021c). The localisation of SDGs is realised through the Regulation of the Minister of Villages, Development of Disadvantaged Regions, and Transmigration Number 21 of 2020 concerning General Guidelines for Village Development and Empowerment of Village Communities by including 18 Village SDGs goals as the direction of development policies and empowering rural communities (Sugandi et al., 2022b). In addition, 222 village SDG indicators can be implemented in villages, where 210 indicators represent Global and National SDG indicators, and 12 indicators describe 18 village SDG points (Sugandi et al., 2022b).

Based on the PDTT Village Regulation Number 13 of 2020, one additional point is also set from the national SDGs, so there are 18 Village SDGs. These extra points are found in the 18th goal: dynamic village institutions and adaptive village culture. This point was added because, according to the Ministry of Villages, village development must be based on the local culture of each Village (Permatasari et al., 2021c).

### 3.4.1 Empowering Village Economies

Poverty indicates the inability of people to meet basic needs, which in turn impacts various problems (Sampedro, 2021). Poverty will leave malnourished generations susceptible to disease and unable to enjoy education (Alawiyah & Setiawan, 2021b). Sharp et al. in Kuncoro (1997) stated that there are several causes of poverty (Taryani et al., 2022) that is:

a. From an economic point of view, poverty occurs due to unequal patterns of resource ownership, which causes inequality in income distribution.

b. Poverty occurs because of differences in human resources. Generally, low human resources will result in low productivity, so the wages received will also be of low value.
c. Poverty occurs because of differences in access to capital.

### 3.4.2 Enhancing Education and Knowledge

Education is the right of every citizen, both for people in urban and rural areas. However, there are still many cases of educational disparities that occur in urban and rural areas. The condition of education in rural areas is quite apprehensive. Poor rural communities do not go to school, and this is exacerbated by incomplete infrastructure services in the village, such as the absence of a high school in a town. This requires villagers who wish to study at the high school level to go to the city and makes it more difficult for people with low incomes in the village to access education (Vito & Krisnani, 2015). In addition, the disparity in education between rural and urban areas can also be seen in the number of educators. In the 3T regions (underdeveloped, foremost, outermost), conditions are often found where the number of educators (teachers) still needs to be improved. Usually, the number of teachers available is only 3-4 people (Anas et al., 2015b). This is different from the conditions in urban areas where the accumulation of teachers often occurs. This differs from the goals achieved in the 4th Village SDGs, namely quality village education (Anas et al., 2015b).

### 3.4.3 Improving Health and Well-being

The recognition of health as a fundamental human right is integral to the overall well-being of individuals. The attainment of optimal health is a prerequisite for prosperity, thereby rendering an individual successful when they are able to attain the pinnacle of physical well-being. The concept of the right to health should not be misconstrued as an entitlement for universal wellness or an obligation for the government to furnish costly healthcare services that beyond its capacity. Furthermore, it is imperative to emphasise the necessity of enabling the government and public officials to formulate diverse policies and strategic initiatives aimed at ensuring the accessibility and affordability of healthcare services for all members of society (Irawan & Sari, 2022). According to the primary health research data of 2018, the major issue in Indonesia pertains to the ease of accessing health services, namely in relation to transportation, cost, and travel time. This problematic category accounts for around 66.9% of the observed cases (Sugandi et al., 2022b).

### 3.4.4 Ensuring Food Security and Sustainable Agriculture

Food security is essential for fulfilling fundamental human rights, promoting nutrition, and supporting regional economic prosperity (Viana et al., 2022). Ensuring food security and sustainable agriculture is the provision of an adequate food supply for current and future populations while maintaining the balance of the environment and natural resources. This of course involves building efficient, inclusive, and environmentally friendly agricultural systems. Food security means ensuring access for all individuals to sufficient, safe, nutritious, and affordable food. Sustainable agriculture involves practices such as using organic fertilizers, integrated pest control, and maintaining healthy soil that can help maintain soil productivity in the long term.

Increased food production will occur in developing countries through intensive agricultural practices based on significant use of chemical pesticides, fertilizers, fossil fuels, and machines (Meyfroidt, 2018). These practices affect soil quality and fertility, cause biodiversity loss, and result in greenhouse gas emissions and environmental pollution (Skaf et al., 2019). However, depletion of natural capital stocks (such as land and water) results in environmental degradation, threatening long-term food supplies (Clark & Tilman, 2017).

### 3.4.5 Promoting Clean Water and Sanitation

Access to safe drinking water, adequate sanitation facilities, and proper hygiene practices are essential for promoting and maintaining the health, well-being, and overall development of individuals (SIWI, 2007). Promoting the provision of clean water and sanitation facilities is vital for safeguarding individuals' health and welfare, as well as for the preservation of the natural environment. Good sanitation includes facilities for the safe disposal of human waste, preventing water contamination and the spread of disease. This involves constructing wells, springs, and an adequate water distribution system, in addition to waste disposal. To promote clean water and sanitation, it is necessary to involve local communities, government, and non-governmental organisations. Support is needed to provide independent and responsible service providers, the private sector, and public-private partnerships in drinking water supply and sanitation (rural and urban), irrigation and drainage, and other sub-sectors, emphasising equal access to water for people experiencing poverty and the underserved (McIntosh, 2014).

### 3.4.6 Providing Access to Clean Energy

Access to clean energy technologies, such as clean cooking fuels and electricity, is essential in improving quality of life, promoting sustainable development, and addressing global environmental challenges (Bansiya, 2023; Siankwilimba et al., 2023). Clean energy refers to energy sources with low carbon emissions and minimal negative environmental impact. The existence of climate change has several critical consequences, such as rising sea levels, changing weather patterns, and so on. This phenomenon can be reduced by reducing CO2 emissions, which can help improve environmental quality with a focus on carbon neutrality. This is possible through significant advances in technological innovation and increased use of clean technologies, leading to increased efficiency of clean energy (Raghutla & Chittedi, 2023). Efforts to provide access to clean energy involve developing infrastructure that allows society to use this energy source efficiently. The construction of solar power plants, wind turbines, and the installation of hydropower plants are examples of projects that support access to clean energy. Promoting access to clean energy can mitigate the effects of climate change, improve people's quality of life, and build a more sustainable future.

### 3.4.7 Supporting Work and Economic Growth

Employment and economic growth in villages are critical aspects of efforts to improve the welfare of rural communities and achieve overall sustainable development. Village-focused economic development can provide wide-ranging benefits, including reducing disparities between urban and rural areas, mitigating over-urbanisation, and building solid foundations for more robust and competitive societies. Economic growth is one indicator of the success of a country's development. Good economic growth means

a country is thriving. Successful development will lead to a prosperous society, meaning the poverty rate is low. Work, in general, can be interpreted as an active activity carried out by workers. Work is usually used for a task that can produce work worth the reward through money or other conditions (Suprijati & Damayanti, 2022).

By focusing on jobs and economic growth in the village, communities can develop local potential, improve welfare, and create a sustainable environment for future generations (Suprijati & Damayanti, 2022).

### 3.4.8 Fostering Industry, Innovation, and Infrastructure

Innovation and infrastructure are two elements that support each other in driving progress and prosperity in the village. Innovation brings new ideas and solutions to overcome challenges, while good infrastructure provides a solid foundation for economic, social, and environmental development. The right combination of innovation and infrastructure can bring significant positive changes to rural communities. To improve competitiveness, an understanding of the role of innovation can increase productivity and welfare. Based on experience, there is a close relationship between innovation and competitiveness. The importance of the role of innovation in a location (region) is determined by the innovation capacity of the area. Regional innovation capacity means the ability of an area to generate commercial innovation flows. This capacity is not only the level of innovation realised but also reflects the fundamental conditions, investments, and policy choices that create the environment for innovation in a region. This innovation capacity depends on technology, workforce, and several policy and investment options that meet productivity (Santoso et al., 2021).

### 3.4.9 Reducing Inequalities in Villages

The concept of "Village without gaps" describes the aspirations and goals of forming a village environment in which equitable distribution of resources, opportunities, access, and welfare is the main focus for all villagers. Within this concept, the main objective is to minimise the striking differences between social groups or individuals regarding income, education, health, access to essential services, and participation in village development.

The goal of the "Village without gaps" concept is to create a more just and sustainable village environment. This involves a series of efforts to address potential inequalities that may arise due to differences in access to resources and opportunities among villagers (Herdiana, 2022). The impact of poverty can create social imbalances within the village, which causes polarisation between the poor and more affluent groups, disrupting interaction and communication between residents.

This, in turn, can undermine harmonious relations among village communities, an aspect traditionally associated with village areas (Ibrahim, 2017). To overcome social inequality in the village, serious efforts are needed. This condition impacts the individuals involved and various aspects of village community life, including the possibility of hurting ongoing development efforts in the village (Herdiana, 2022).

### 3.4.10 Gender Equality

The involvement of village women takes the form of Village SGDs in empowering village women. This Village SGD point does not only focus on equalising women; this point places all village residents in a fairer position, especially since there is no discrimination

in all aspects of village life for women. In addition, women must also have equal opportunities in public affairs. Apart from that, the availability of opportunities for women's involvement in village government as village officials is also an indicator of achieving this SGD point (Iskandar, 2020).

In rural development, women have a large role in the agricultural sector, both in terms of being farmers and processing agricultural products. However, regarding land ownership, women are discriminated against due to gender bias in inheritance laws, social norms that limit the implementation of these laws, land markets, and government land distribution schemes (Agarwal, 2018).

### 3.4.11 Promoting Responsible Consumption and Production

These SDGs aim to reduce the environmental impact of human activities through a wiser approach to producing and using goods. Economic growth is the main factor in achieving social welfare. However, economic growth must take into account sustainability factors. Therefore, steps are needed to reduce ecological impacts through production methods and resource use changes. Separation between economic growth and resource utilisation and reducing environmental damage is one of the village's goals in implementing the SDGs.

SDG success indicators involve setting up business waste management and formulating natural resource efficiency policies by the village government. Apart from that, efforts in managing household and industrial waste are also a benchmark (Iskandar, 2020). According to UCLG (2018), the potential of local governments in reducing supply chains includes land management, infrastructure, regional planning, education, training, and traditional markets. The role of local governments in regulating sustainable consumption and production of energy and water is very important. This can be realised through various means, from regional planning to implementing a unit-based tariff system.

### 3.4.12 Taking Action on Climate Change

Rural areas are of paramount importance in the context of climate change. Rural communities, being tightly intertwined with agriculture and food production, exhibit a heightened susceptibility to the repercussions of climate change, including rising temperatures, alterations in precipitation patterns, and the occurrence of drought. Furthermore, it should be noted that rural areas make a significant contribution to the production of greenhouse gases through various activities such as agricultural practices, energy consumption, and waste disposal. Nevertheless, it is important to acknowledge that rural areas possess the capacity to contribute to both climate change mitigation and adaptation efforts.

According to (Bruce et al., 2018), the implementation of sustainable farming methods, effective management of natural resources, and the diversification of livelihoods in rural regions have the potential to contribute to the reduction of greenhouse gas emissions and enhance resilience to climate change. Agricultural actors need to invest in climate-smart agriculture (CSA) practices to deal with climate change. An inclusive agricultural business model is essential (Ahsan et al., 2021).

### 3.4.13 Life Below Water

Marine ecosystems are one of the goals in the 14th Sustainable Development Goals (SDGs) related to preserving marine resources. This impacts marine ecosystems due to waste and oil pollution that often occurs in Indonesia. Indonesia is a country that is rich in natural resources. This, of course, triggers entrepreneurs to form a business. The environmental damage experienced by Indonesia is related to the Indonesian economy; one of the damages is forest and oil fires in the oceans.

The 14th SDG Sustainable Development Goals protect the natural wealth that can become potential (Hadiyati, 2021). Ecosystem development in Indonesia is also a priority because Indonesia has a dominant water area. SDG number 14 can encourage the preservation of the sea and marine resources for sustainable development (Rachman et al., 2023).

### 3.4.14 Ensuring Peaceful and Inclusive Societies

Sustainable development involves the community, which can be achieved by strengthening an inclusive and peaceful society. In addition, the strengthening of an inclusive and friendly society can also be achieved by providing access to justice for all people and the existence of effective, accountable, and inclusive institutions at all levels.

Based on the rule of law, stability, peace, human rights, and effective government is an important pathway where sustainable development is desired. One of the SDGs that is particularly applicable for sustainable development is number 16. This arises due to the perceived high level of armed violence, resulting in a diminished sense of security which can damage development. In addition, there are also other impacts, such as deteriorating economic growth. Based on (BAPPENAS, 2021), Indonesia is at the stage of resolving issues related to protecting civil and political rights owned by the community.

### 3.4.15 Life on Land

The mainland region has quite abundant wealth. This wealth is in the form of raw materials, which can later be processed into construction materials, energy, food, etc. Land ecosystems require efforts to protect, restore, and promote the conservation and sustainable use of terrestrial ecosystems. SDG number 15 has a special focus on sustainably managing forests, halting and reversing the degradation of land and natural habitats. In addition, these SDGs can lead to success in fighting decline and stopping the loss of biodiversity or natural wealth. This leads to future generations, and it is hoped that these generations will be able to enjoy rich terrestrial ecosystems (United Nations, 2019).

### 3.4.16 Enhancing Access to Justice

One of the 18 SDGs Village goals is "Enhancing Access to Justice," which means increasing access to justice for all village communities. A just village can be achieved by creating a safe village for all its people. Realising a safe village for the community will result in a just and practical life because every community feels that their rights to security and protection are fulfilled. Efforts that the government can make to keep the village safe, which can foster a sense of justice for the community, is to reduce all forms of violence that impact the community's security. In addition, another effort that can be made is to find long-term solutions to conflicts that usually occur between villages.

These SDGs have several targets to achieve, namely creating a village without crime, brawls, domestic violence (KDRT), violence against children, preserving a culture of cooperation in society, increasing the village democracy index, and prohibiting human trafficking and child labour (Khoiriah & Perbawati, 2023). Although villagers prefer to resolve issues informally and are aware of the well-known weaknesses of the legal system, they are willing to use the legal system as a last resort to defend their interests in cases where their existing village institutions have failed.

Villagers' access to the legal system will likely depend on whether they have facilitators with links to NGOs, local government, or village development project management structures (Salim, 2018).

### 3.4.17 Promoting Partnerships for Sustainable Development

The SDGs are sustainable development programs that aim to improve the community's economic welfare. SDG goal number 17 is "Promoting Partnerships for Sustainable Development," which means realising villages by collaborating with partners for sustainable development. The collaboration that can be carried out can be started by community leaders from village youth and girls, the business community, village leaders, village officials, and the Village Consultative Body (BPD) (Khoiriah & Perbawati, 2023). The existence of cooperation is carried out because sustainable development will only be realised with the cooperation of the entire community and partners concerned. These SDGs require good partnerships within the scope of one village or with other villages to achieve sustainable development. The village, as the smallest government administrator, is the spearhead of both service and development.

### 3.4.18 Elevating Cultural and Religious Aspects

SDG number 18 is "Cultural and Religious Aspects," which means trying to maintain local wisdom and actively involve all elements of village institutions. As is the involvement of all aspects of the village, the strength and functioning of institutions in the village in community life will support the life of diversity in a dynamic village and a driver for achieving the Village SDGs.

Village institutions are a significant factor in promoting sustainable development. Therefore, village institutions need to be strengthened to support achieving sustainable development goals (Khoiriah & Perbawati, 2023). From a cultural point of view, religions in Indonesia are national assets because these religions have given us something as a legacy that needs to be preserved. Mutual compassion is a form of religious-social communication and interaction that is emphased by many of these belief systems. In other words, mutual love is a quality of interaction that upholds the values of "divine and human values" in society, a nation, and a state (Mahfuz, 2019).

## 3.5 Conclusion

Indonesia's commitment to achieving the SDGs is by seeking to formulate poverty alleviation strategies at both the national and regional levels. As a follow-up agenda from the MDGs, the SDGs accommodate more comprehensive and accommodating development issues. Development issues that still need to be created in the MDGs. The SDGs have development goals that are more participatory and involve non-social-economic environmental stakeholders. So, the SDGs become a global initiative to create a socio-economic community that better synergises with the environment (Iskandar,

2021). Villages are areas that have a large economic and social role and show a resilience in dealing with crises and socio-economic variance that is stronger than that of cities (Iskandar, 2021).

If viewed from a regional aspect and a comparison of the total population, the role of Village SDGs is very important and a higher value achievement target. Various things have been done to realise the Village SDGs Sustainable Development Goals, such as allocating village funds so that the village government can improve the economy of the village community and reduce the number of people below the poverty line.

# References


Agarwal, B. (2018). Gender equality, food security and the sustainable development goals. *Current Opinion in Environmental Sustainability*, *34*, 26–32. https://doi.org/10.1016/J.COSUST.2018.07.002

Ahsan, D., Brandt, U. S., & Faruque, H. (2021). Local agricultural practices to adapt with climate change. Is sustainability a priority? *Current Research in Environmental Sustainability*, *3*, 100065. https://doi.org/https://doi.org/10.1016/j.crsust.2021.100065

Alawiyah, T., & Setiawan, F. (2021). Pengentasan Kemiskinan Berbasis Kearifan Lokal pada Masyarakat Desa Pemerintah telah mengimplementasikan Millenium Development Goals ( MDGs ) hingga Sustainable Development Goals ( SDGs ) dalam. *Jurnal Sosiologi Usk (Media Pemikiran & Aplikasi)*, *15*(2), 131–154.

Anas, A. Y., Riana, A. W., & Apsari, N. C. (2015). Desa Dan Kota Dalam Potret Pendidikan. *Prosiding Penelitian Dan Pengabdian Kepada Masyarakat*, *2*(3), 418–422. https://doi.org/10.24198/jppm.v2i3.13592

Bammer, G. (2005). Integration and Implementation Sciences: Building a New Specialization, *Ecology and Society*, 10(2), 6.. https://www.jstor.org/stable/26267751

Bruce M, C., James, H., Janie, R., Clare M, S., Stephen, T., & Eva, (Lini) Wollenberg. (2018). Urgent action to combat climate change and its impacts (SDG 13): transforming agriculture and food systems. *Current Opinion in Environmental Sustainability*, *34*(Sdg 13), 13–20. https://doi.org/10.1016/j.cosust.2018.06.005

Clark, M., & Tilman, D. (2017). Comparative analysis of environmental impacts of agricultural production systems, agricultural input efficiency, and food choice. *Environmental Research Letters*, *12*(6), 064016. https://doi.org/10.1088/1748-9326/aa6cd5

Coulter, J. K. (1992). Unwelcome Harvest: Agriculture and Pollution. By G. R. Conway and J. N. Pretty. London: Earthscan Publications Ltd (1991), pp. 672, £15.00. ISBN 1-85383-036-4. *Experimental Agriculture*, *28*(4), 478–478. https://doi.org/10.1017/S0014479700020226

Damayanti, R. A., & Syarifuddin, S. (2020). The inclusiveness of community participation in village development planning in Indonesia. *Development in Practice*, *30*(5), 624–634. https://doi.org/10.1080/09614524.2020.1752151

Del Arco, I., Ramos-Pla, A., Zsembinszki, G., Gracia, A. de, & Cabeza, L. F. (2021). Implementing sdgs to a sustainable rural village development from community empowerment: Linking energy, education, innovation, and research. *Sustainability (Switzerland)*, *13*(23), 12946. https://doi.org/10.3390/su132312946

Febriani, R., & Samudra, S. (2023). Implementasi Sustainable Develoment Goals (SDGs) Desa Sebagai Upaya Menuju Kemandirian Desa Kotarindau. *Ilmiah Publika*, *11*(1), 102-111. DOI: http://dx.doi.org/10.33603/publika.v11i1.8518

Fung, A., & Kennedy, J. F. (2006). *Articles on Collaborative Public Management*. https://citeseerx.ist.psu.edu/document?repid=rep1&type=pdf&doi=70bdfff8423fc513d9f7b93598d7cbc71ea4570e

Hadiyati, N. (2021). *NUSANTARA: Jurnal Ilmu Pengetahuan Sosial Kontekstualisasi Pencemaran Ekosistem Laut Dalam Mencapai Sdgs: Suatu Kajian Hukum Lingkungan Di Indonesia 1, 8*(3), 300-313. https://doi.org/10.31604/jips.v8i3.2021.300-313

Herdiana, D. (2022). Kemiskinan, Kesenjangan Sosial dan Pembangunan Desa. *Jurnal Inovasi Masyarakat*, *2(3)*(Sep), 172–180.

Ibrahim, H. R. (2017). Potret Pertumbuhan Ekonomi, Kesenjangan Dan Kemiskinan Di Indonesia Dalam Tinjauan Ekonomi Politik Pembangunan. *Jurnal Ilmu Dan Budaya, 40*(55), 6305-6328.

Irawan, A., & Sari, M. I. (2022). Mewujudkan Desa Sehat Dan Sejahtera di Desa Candijati. *National Multidisciplinary Sciences*, *1*(1), 48–52. https://doi.org/10.32528/nms.v1i1.10

Iskandar, A. H. (2020). *SDGs DESA : Percepatan Pencapaian Tujuan Pembangunan Nasional Berkelanjutan*. Yayasan Pustaka Obor Indonesia.

Iskandar, A. H. (2021). *SDGs desa : percepatan pencapaian tujuan pembangunan nasional berkelanjutan,* 1-18. Yayasan Pustaka Obor, Indonesia.

Iskandar, H. (2020). *SGDs Desa Percepatan Pencapaian Tujuan Pembangunan Nasional Berkelanjutan* (Suja'ie Ach. Faidy & Agusta Ivanovich, Eds.). Yayasan Pustaka Obor Indonesia.

Linggarwati, T., Haryanto, A., Miryanti, R., & Darmawan, A. B. (2021). Implementasi Sdgs Di Desa Pandak, Kecamatan Baturraden, Kabupaten Banyumas. *Pengembangan Sumber Daya Perdesaan Dan Kearifan Lokal Berkelanjutan XI*, 361–368.

Lowery, B., Dagevos, J., Chuenpagdee, R., & Vodden, K. (2020). Storytelling for sustainable development in rural communities: An alternative approach. In *Sustainable Development* (Vol. 28, Issue 6, pp. 1813–1826). John Wiley and Sons Ltd. https://doi.org/10.1002/sd.2124

Mahesh Bansiya. (2023). Analyzing the Progress and Disparities in Access to Clean Energy Technologies: A Comparative Study of Rural and Urban Areas of India. *International Journal For Multidisciplinary Research*, *5*(3). https://doi.org/10.36948/ijfmr.2023.v05i03.4182

Manurung, E. T., Maratno, S. F. E., Permatasari, P., Rahman, A. B., Qisthi, R., & Manurung, E. M. (2022). Do Village Allocation Funds Contribute towards Alleviating Hunger among the Local Community (SDG#2)? An Insight from Indonesia. *Economies*, *10*(7), 10070155. https://doi.org/10.3390/economies10070155

McIntosh, A. C. (2014). *Urban water supply and sanitation in Southeast Asia : a guide to good practice*. Asean Development Bank.

Meyfroidt, P. (2018). Trade-offs between environment and livelihoods: Bridging the global land use and food security discussions. In *Global Food Security* (16, 9–16). Elsevier B.V. https://doi.org/10.1016/j.gfs.2017.08.001

Permatasari, P., Ilman, A. S., Tilt, C. A., Lestari, D., Islam, S., Tenrini, R. H., Rahman, A. B., Samosir, A. P., & Wardhana, I. W. (2021). The village fund program in indonesia: Measuring the effectiveness and alignment to sustainable development goals. *Sustainability (Switzerland)*, *13*(21), 12294. https://doi.org/10.3390/su132112294

Rachman, F., Yunita, S., Manik, M. M., Girsang, O. B., Safitri, E., Sabri, T. M., Halizah, N., Yasmin, P., & Juliandi, J. (2023). Pembangunan Ekosistem Laut Berkelanjutan Melalui Keterlibatan Warga Dalam Pengelolaan Hutan Mangrove di Desa Tanjung Rejo. *Jurnal Kewarganegaraan*, *20*(1), 40. https://doi.org/10.24114/jk.v20i1.43782

Raghutla, C., & Chittedi, K. R. (2023). The effect of technological innovation and clean energy consumption on carbon neutrality in top clean energy-consuming countries: A panel estimation. *Energy Strategy Reviews*, *47*. https://doi.org/10.1016/j.esr.2023.101091

Sampedro, R. (2021). The Sustainable Development Goals (SDG). *Carreteras*, *4*(232), 8–16. https://doi.org/10.1201/9781003080220-8

Santoso, I., Purnomo, M., Sulianto, A. A., & Choirun, A. (2021, November). Machine learning application for sustainable agri-food supply chain performance: a review. In *IOP Conference Series: Earth and Environmental Science,* 924 (1), p. 012059. https://iopscience.iop.org/article/10.1088/1755-1315/924/1/012059/pdf

Sheely, R. (2015). Mobilization, Participatory Planning Institutions, and Elite Capture: Evidence from a Field Experiment in Rural Kenya. *World Development*, *67*, 251–266. https://doi.org/10.1016/j.worlddev.2014.10.024

Shucksmith, M. (2010). Disintegrated rural development? Neo-endogenous rural development, planning and place-shaping in diffused power contexts. *Sociologia Ruralis*, *50*(1), 1–14. https://doi.org/10.1111/j.1467-9523.2009.00497.x

Siankwilimba, E., Hiddlestone-Mumford, J., Hoque, E.-M., Hang'ombe, M. B., Chisoni, M., Hasimuna, O. J., Maulu, S., Mphande, J., Chibesa, M., Moono, M. B., Muhala, V., Cavaliere, L. P. L., Faccia, A., & Prayitno, G. (2023). Sustainability of Agriculture Extension Service in the Face of COVID-19 : A Study on Gender Market Systems. Cogent Food & Agriculture, 9(2), 25. https://doi.org/10.1080/23311932.2023.2284231

SIWI. (2007). *Planning for drinking water and sanitation in peri-urban areas : a proposed framework for strategic choices for sustainable living.* Stockholm International Water Institute (SIWI).

Skaf, L., Buonocore, E., Dumontet, S., Capone, R., & Franzese, P. P. (2019). Food security and sustainable agriculture in Lebanon: An environmental accounting framework. *Journal of Cleaner Production*, *209*, 1025–1032. https://doi.org/10.1016/j.jclepro.2018.10.301

Sugandi, I., Abdoellah, O. S., & Gunawan, B. (2022a). Analysis of The Sustainable Development Policies of Local Communities in Indonesia. *Transformasi: Jurnal Manajemen Pemerintahan*, *14*(2), 101–118. https://doi.org/10.33701/jtp.v14i2.2258

Sugandi, I., Abdoellah, O. S., & Gunawan, B. (2022b). Analysis of The Sustainable Development Policies of Local Communities in Indonesia. *Transformasi: Jurnal Manajemen Pemerintahan*, *14*(2), 101–118. https://doi.org/10.33701/jtp.v14i2.2258

Santoso, S., Pradipta, S., Sumantono, T., & Fatmawati, A. A. (2021). Pengembangan Desa Wisata Berkonsep Kapasitas Inovasi Daerah Di Desa Tanjungjaya, Kabupaten Pandeglang, Provinsi Banten. *Jurnal Kepariwisataan Indonesia: Jurnal Penelitian Dan Pengembangan Kepariwisataan Indonesia*, *15*(2), 71–85. https://doi.org/10.47608/jki.v15i22021.71-85

Suprijati , SE, MM, J., & Ratna Damayanti, S. (2022). Pengentasan Kemiskinan Kota/Desa 31 Propinsi Di Indonesia Melalui Pertumbuhan Ekonomi Yang Dibentuk Dari Pmdn Dan Pekerja. *Develop*, *6*(1), 87–104. https://doi.org/10.25139/dev.v6i1.4587

Swapan, M. S. H. (2014). Realities of community participation in metropolitan planning in Bangladesh: A comparative study of citizens and planning practitioners' perceptions. *Habitat International*, *43*, 191–197. https://doi.org/10.1016/j.habitatint.2014.03.004

Taryani, A., Rahma, N. N., Alam, N. S., Putri, R. Y. E., Belindasari, R. R. A. D., & Suparjito. (2022). Mewujudkan Desa Tanpa Kemiskinan Dan Kelaparan Dengan Dana Desa (2019-2020) Di Jawa Tengah. *Jurnal Pembanguan Ekonomi Dan Keuangan Daerah*, *23*(1), 112–125.

UCLG. (2018). *Tujuan Pembangunan Berkelanjutan Yang Perlu Diketahui Oleh Pemerintah Daerah*. United Cities and Local Governments .

Viana, C. M., Freire, D., Abrantes, P., Rocha, J., & Pereira, P. (2022). Agricultural land systems importance for supporting food security and sustainable development goals: A systematic review. In *Science of the Total Environment* (Vol. 806). Elsevier B.V. https://doi.org/10.1016/j.scitotenv.2021.150718

Vito, B., & Krisnani, H. (2015). Kesenjangan Pendidikan Desa Dan Kota. *Prosiding Penelitian Dan Pengabdian Kepada Masyarakat*, *2*(2), 247–251. https://doi.org/10.24198/jppm.v2i2.13533

# CHAPTER 4: THE ROLE OF SOCIAL CAPITAL IN INCREASING COMMUNITY PARTICIPATION PLANNING

***Authors: Ismu Rini Dwi Ari, Gunawan Prayitno, and Wawargita Permata Wijayanti***

## Abstract

This chapter begins with an introduction to how social capital plays a role in the development of society. The related discussion explains the main components of social capital, including social networks that build connections within communities, trust that is the basis of collaboration, norms that reflect shared values and collective expectations, as well as principles of mutual giving and receiving support, and honesty, responsibility, cooperation and tolerance as pillars of social capital. It also describes the positive impact of social capital in development planning, especially in the context of community participation. In particular, the role of social capital in community-based development and how social capital can be used to strengthen effective planning. Through understanding social capital communities can be more actively involved in planning, building strong relationships promoting trust, and contributing to the success of development initiatives. This chapter emphasises the important role of social capital which can be used as a powerful tool in advancing sustainable development that actively involves society.

**Keywords:** social capital, participation, community, development

## 4.1 Introduction

Community participation is important in sustainable community development which must be carried out within the stages of the community development process, namely identifying needs, planning community development, implementing project management, and evaluation. The concept of community participation can be interpreted as a process in which participating community members place themselves to work in a group. Community participation must be goal-oriented in community development in various communities within a society. Through this community participation, it can provide an opportunity for the community to participate in a sustainable community that also influences their lives. Development itself is defined as a process or series of activities that do not stop and will continue to bring about changes in people's lives to improve the quality of life which will also continue to change. Community involvement in development refers to the active participation and contribution of the community in the planning, implementation, and evaluation process of development projects. This involves involving communities in decision-making, obtaining information, and participating in development-related activities (Aldegheishem, 2023).

The government assumes the position of project initiator in order to facilitate community engagement in government-led projects (Buchori et al., 2022). The government bears the responsibility of engaging the local community from the initial phases of the project and meeting the desires of the local populace. The government has the ability to utilise its bureaucratic authority in order to promote and foster societal engagement. Furthermore, it is imperative for the government to establish mechanisms

*Ismu Rini Dwi Ari*, Gunawan Prayitno, and Wawargita Permata Wijayanti*
**email: dwiari@ub.ac.id*
https://doi.org/10.11594/futscipress30

that provide regular and effective communication between village officials and local populations, thereby fostering active community engagement in projects initiated by the government. In order to attain lasting and effective outcomes, it is imperative to foster community engagement and motivation in the context of development initiatives. It is imperative for governments to give precedence to community-led initiatives and facilitate the empowerment of communities in assuming responsibility over the decision-making procedures. By ensuring the consideration and resolution of community goals and concerns, the implementation of development efforts can be enhanced, leading to increased success and impact. By including community engagement into the decision-making process, the project will garner increased acceptance and recognition from the community.

## 4.2 Understanding Social Capital in Development

The concept of social capital is a popular concept for various disciplines. Both the social sciences, politics, and economics utilise the concept of social capital in seeking answers to issues and various questions in their fields. Social capital is generally defined and understood as the goodwill generated by various relationships in social life and can be mobilised to facilitate action. Several studies on social capital can be in the form of studies on the family, adolescent behaviour problems, public health, social life, government, economic development, and general issues. The scope of the social capital notion is indicative of a fundamental characteristic of societal existence. Social capital refers to a form of social connection that can be utilised for various objectives, including but not limited to providing moral and material assistance, facilitating professional and non-professional endeavours (Adler & Kwon, 2002).

### 4.2.1 Fukuyama's Perspective on Cultural Factors and Social Capital

As to Fukuyama's perspective (1995), Social capital refers to an individual's capacity to effectively collaborate with others towards shared objectives within the context of various social groups or organisations. Social capital can be succinctly characterised as the presence of a certain collection of informal values or standards that are mutually embraced by individuals within a particular community, hence facilitating cooperative interactions among them (Fukuyama, 1997). Fukuyama (2001), the critique, posits that economists often employ a naive assumption of human rationality, neglecting the potential impact of conduct aimed at maximising utility on societal dynamics. Nevertheless, this perspective fails to acknowledge the significance of the social value system. The examination of social and cultural issues holds significant importance within theoretical frameworks, particularly when considering the economy. The economic activities are intricately intertwined with the social structure, wherein sociocultural values exert an influence on an individual's characteristics, therefore impacting economic outcomes. Hence, it can be argued that social elements play a pivotal role in shaping economic advancement, and it is imperative to consider socio-cultural factors alongside economic theory in order to attain a comprehensive understanding of the subject matter (Adler & Kwon, 2002).

The process of development is characterised by its diverse and intricate nature, encompassing significant transformations in social structure, behaviour, and institutions (Todaro, 2000). The variables encompassed in this context are economic, social, cultural, political, and environmental in nature. Hence, development encompasses not just

economic growth but also the enhancement of overall well-being, necessitating equitable attention to the underlying social and cultural frameworks. The aforementioned cultural element represents a socio-cultural value system that plays a significant role in shaping economic, social, and political behaviour, hence exerting an influence on the process of development. For development to be deemed effective, it is imperative that it transcends the confines of economic considerations and includes socio-cultural issues as well (Barro & McCleary, 2002). If development is conceptualised not solely as an increase in revenue, but rather as a broader enhancement of quality of life, cultural values can serve as either a means or an ultimate goal of development. Hence, it can be inferred that both economic and social aspects hold equal significance in elucidating economic phenomena. The cultural dimension gives rise to a development approach that is focused toward norms, values, beliefs, and institutions (Bhandari & Yasunobu, 2009).

### 4.2.2 The Complex Relationship between Culture, Institutions, and Social Capital

Several scholars, including Knack and Keefer (1997) Examine the concept of social capital as a means of assessing the relationship between the beliefs and norms of civil society cooperation and economic growth. Trust and norms of cooperation have a strong impact on each other. The existence of social capital consists of two larger components to solve various problems, especially in terms of ethnic or cultural disparities and differences. Cultural factors extend to all dimensions of a society's social capital which underlie the basic components of social capital such as mutual trust, responsible social behaviour, and associative levels. In line with this, Chang's research (1997) also noted that social capital acts as values that increase the basic concern of a society/citizen above considerations of shared welfare and plays an important role in determining whether there will be progress in terms of social networks, norms, and mutual trust. Values that are fundamental in culture such as solidarity, altruism, respect and tolerance, etc. Culture is an important part of social capital. Culture can be an instrument of economic and social progress. The development of a society's culture is also the ultimate goal, to promote the spiritual and historical enrichment of a society and the individuals who make it up because it can give meaning to the existence of the society itself. So that this aspect should not be lost from development (Kliksberg, 1999).

In regard to culture and its relationship with social institutions, culture can make an effective contribution to the most basic social institutions, such as the family. Several studies have shown that, apart from the role of the family, it also has a major influence in many fields, such as children's education, the formation of creativity and capacity, the development of emotional intelligence, and so on. Thus, this implies that culture can help strengthen institutions (Kliksberg, 1999). The relationship between culture and institutions occurs where institutions can affect cultural change. The complex interaction between culture and institutions is an interesting phenomenon. In general, research that examines the relationship between culture and institutions tends to isolate one causal aspect and prefers one of two directions (Alesina & Giuliano, 2015). Institutions complement social capital. In the social context, institutions affect and change the outcome of a policy, and more generally, social capital in a positive way. The relationship between trust and good institutions reinforces one another. In particular, social capital is usually associated with the concept of informal institutions.

Institutions are defined as a combination of formal constraints (e.g. rules, laws, constitutions), informal constraints (e.g. norms of behaviour, conventions, self-imposed codes of ethics, etc.), and the characteristics of their enforcement. Then these formal and

informal institutions contribute to the development of social capital (Savioli & Patuelli, 2016).

## 4.3 Components of Social Capital

### 4.3.1 Social Networks: Building Connections within the Community

Three groupings that can explain the strength of social capital are bonding social capital (binders and adhesives), bridging social capital (connecting, bridging), and linking social capital (hooks, connections, and networks). These three things can be things that facilitate social capital to be achieved efficiently and effectively. Trust, norms, and networks are things that cannot be separated from one another which will then result in a sense of responsibility, caring, honesty, cooperation, inclusiveness, mutual trust, solidarity, transparency, feelings of security and comfort, and produce a positive work ethic (Abdullah, 2013). A community has the possibility or potential to build networks and access other communities that have access to things that are different from the community. The relationship that is created appears to be a profitable engagement rather than making a community dependent on other communities. This can encourage individual development in a community. An advanced community can be seen from its ability to adapt to build connections within the community. Communities can have network potential and access in the form of relations and communication with the outside world or within national boundaries. This potential can be an experience that can strengthen the potential of human capital in the form of skills and insights into managing their lives and livelihoods. Social networks are part of one of the social capitals that can build connections in the community. Networks and relationships are expansive, and all forms of network and relationship are important for community efforts in dealing with the problems they face (Abdullah, 2013). Linking social capital with an external orientation is effective in building relationships and networks in groups of different social strata which is almost the same as bridging social capital (Abdullah, 2013).

### 4.3.2 Trust: Establishing Confidence for Collaboration

Trust is a fundamental component within the framework of social capital, serving as a cornerstone for the establishment and cultivation of robust and cooperative interpersonal connections within a given community. Trust plays a significant role in influencing social interactions, fostering cooperation, and facilitating constructive exchanges within a society. Trust is a fundamental component of social capital, since it plays a pivotal role in fostering a collaborative, efficient, and enduring atmosphere within a given community. Through the establishment of trust, society has the potential to foster favourable development and surmount prevalent obstacles (Abdullah, 2013).

Social capital is a concept that primarily encompasses the notion of trust within a social context. The vitality and resilience of a community derive from the synergistic process of social capital, encompassing shared values, conventions, and interconnected networks. Trust plays a critical role in fostering and sustaining social capital. The concept of trust can be understood as an intentional behaviour exhibited in situations involving inherent risks. For an individual to place their trust in another person, there must exist a justifiable rationale. The sources of trust are many and interconnected, encompassing factors such as factual information, institutional endorsements, confidence in one's own convictions, and other elements that necessitate a certain degree of willingness to place trust in an individual or community (Hardison, 2004).

Three typologies of social capital include bonding social capital, bridging social capital, and linking social capital, which can facilitate relations and cooperation as well as goals that can be achieved efficiently and effectively. Bridging social capital is the ability to connect or bridge relationships between individuals and groups and different communities where this strength is also based on existing or previously built beliefs, which then opens opportunities for these individuals, groups, or communities to be accessible. This capital can be used as an initial opportunity to access other potentials as trust also determines the potential of a community. There are hierarchical differences in relations between individuals in social strata and for optimising this potential, trust as the core strength of social capital lies in how high the trust is and the level of adherence to norms by a community (Abdullah, 2013).

### 4.3.3 Norms: Shared Values and Collective Expectations

Norms have a significant role in shaping a social environment that is characterised by inclusivity, fairness, and the mutual respect of shared values, within the context of social capital. By adhering to established rules, society has the potential to enhance pleasant relationships and facilitate the advancement of sustainable development. As per Woolcock's assertions (1998), Social capital refers to the level of social cohesion present within a certain community. Social interaction encompasses the various mechanisms by which individuals establish connections, establish shared norms, cultivate social trust, and facilitate collaborative efforts that provide reciprocal benefits (Mukrimaa et al., 2016). Norms serve as a framework for effectively managing and attaining shared objectives. Norms are not just interconnected but also intricately linked with trust and networks, forming an inseparable bond that ultimately generates favourable outcomes. According to Coleman (year), social capital encompasses various manifestations such as duties and expectations, information potential, norms and effective punishments, authority relations, flexible social organisation, and deliberate organisation, among others. Social capital, in the form of social bonds, ideals, or norms, consistently shapes the patterns of daily interactions. The potency of social capital within this particular bonding arrangement is constrained solely to the realm of group cohesiveness. The high attachment between groups also leads to high fanaticism and tends to be closed. Thus, every individual who feels they have the same identity, coming from the same tribe, coming from the same religion, coming from the same area of origin causes these individuals to have a high sense of moral obligation to each other to give and receive each other (Abdullah, 2013).

### 4.3.4 Reciprocity: Mutual Exchange of Support

Reciprocity is a tendency to exchange kindness between individuals in a group or between groups themselves (Hasbullah, 2006). Fukuyama explained that the term reciprocal principle (reciprocity) refers to exchanges that can occur at different times. The intention is that one party can provide benefits without expecting an immediate response and does not want commensurate rewards (Fukuyama, 2002). The principle of reciprocity reflects the good quality of social capital. Regarding the repetition of interactions, as meant by Fukuyama (2002) "people who have a reputation for being dishonest will be avoided, while honest people tend to cooperate with other honest people. Because the past cannot be completely used as a benchmark for predicting the future, there is always the possibility that people who are willing to work with me today will betray me tomorrow." However, even a small ability to distinguish which people are

willing to cooperate and which are not can still provide considerable benefits to one's ability to build cooperative relationships.

One of the conditions for forming networks and social cooperation is the existence of a norm of reciprocity (moral exchange between members) (Fathy, 2019). The purpose of bridging social capital is that bridging relationships are better in terms of external asset relations and for the dissemination of information and can build broader identities and reciprocity (Putnam, 2000). Reciprocity is a component of social capital characterised by a tendency to exchange kindness between individuals who are part of the network. The measurement criteria for reciprocal relationships are the level of social care and mutual assistance (Mamahit et al., 2016).

One of the important elements in the concept of social capital is reciprocity, which refers to mutually beneficial exchanges of support and interaction between individuals or groups in a society. This reciprocity plays an important role in building mutually reinforcing relationships and promoting cooperation within the community (Mamahit et al., 2016). In social capital, reciprocity plays a role in creating a mutually interacting and supportive social environment. By building positive reciprocity, communities can increase their capacity to overcome challenges and achieve common goals (Mamahit et al., 2016).

### 4.3.5 Honesty, Responsibility, Cooperation, and Tolerance: Pillars of Social Capital

The essence of the concept of social capital consists of several main pillars: honesty, responsibility, cooperation, and tolerance. These pillars are the foundation for building mutually beneficial relationships, promoting shared prosperity, and enabling society to interact positively.

1. **Honesty**: Honesty is a fundamental value in social capital. This includes openness, honesty in communication, and integrity in action. Honesty is important in various aspects of life. Honesty builds trust among community members and promotes stronger relationships. Honesty is very important for everyone and must be used in everyday life. Honesty is important because by acknowledging what is on our minds, and what we feel and do, a person can avoid the guilt that arises as a result of the lies he has committed. With honesty, a person can hold trust and betrayal does not occur. Legally, a person's level of honesty can be judged by the determination of what someone talks about based on the truth and reality of what happened (Chairilsyah, 2016).
2. **Responsibility**: Responsibility refers to the awareness of individuals or groups to carry out their duties and obligations seriously. This includes responsibility to oneself, the community, and the environment. Individual responsibility means that a person dares to act, and dares to be responsible for all the risks of his actions. Meanwhile, responsibility means that all the actions that a person commits must have prior consideration about the consequences and the pros and cons for other people, society, and the environment (Ardila et al., 2017).
3. **Cooperation**: Cooperation is an important element in social capital. It involves the ability of individuals or groups to work together, sharing knowledge, resources, and efforts to achieve common goals. Cooperation is a social process, in which there are certain activities aimed at achieving goals by helping each other and understanding each other's activities (Man & Sleman, 2010).

4. **Tolerance**: Tolerance refers to respect for differences and diversity in society. This includes acceptance of different views, cultures, and beliefs, and the ability to coexist in harmony. Tolerance is the ability and willingness of a person and the general public to be aware of the rights of small groups where the group lives within the rules determined by the majority which is the basis of democracy (Pitaloka et al., 2021).

In social capital, the pillars of honesty, responsibility, cooperation, and tolerance are inseparable components. By strengthening these values, society can build an environment based on positive, sustainable, and inclusive principles.

## 4.4 The Impact of Social Capital in Development Planning

The results of decisions frequently arise from a combination of human capital and social capital. Human capital plays a crucial role in enabling individuals to effectively assess information and strategically plan their activities. Simultaneously, social capital exerts its impact by shaping individuals' tastes and priorities. These encounters have the potential to lead to decisions that are more optimal or aligned with prevailing societal norms and values. The concept of decision efficacy pertains to the degree to which a choice attains the objectives established by management during the decision-making process (Thaler et al., 2022).

The concept of social capital is extensively utilised and analysed within the fields of social sciences, political science, economics, and some areas of organisational research. Multiple scholars argue that social capital is a complex concept that encompasses various dimensions, including cognitive, relational, and structural aspects (Bourdieu, 1986; Coleman ,1988; Putnam 1993). The structural dimension of social capital pertains to the placement of an individual actor within a network of interconnected actors. This positioning is considered a significant factor that influences decision outcomes.

Decision-makers are influenced by a diverse range of knowledge that is transmitted through their connections with other players (Stam & Elfring, 2008). The significance of social capital in the decision-making process is widely recognised among decision-makers as it contributes to the effectiveness of their decisions. This is primarily due to the fact that social connections play a crucial role in providing information for decision-making, including both the substance of the information and its verification (Jansen et al., 2013; Wang, 2020; Westhead et al., 2009).

## 4.5 Social Capital and Community-Led Development

According to Putnam (1993) social engagement is facilitated through horizontal interactions, leading to organisations that are characterised by increased openness and productivity within social networks. In recent times, there has been a noticeable increase in the occurrence of informal encounters within organisations, such as card games and banquets. This trend highlights the growing recognition of social interaction as a crucial mechanism for establishing and fostering social networks. The building of social capital is significantly influenced by the active participation of local communities. Social capital is a concept that encompasses the intricate web of social connections, shared ideas, cultural norms, and interpersonal exchanges that exist among individuals within a given society. A local community can be defined as a social setting where individuals reside, engage in social interactions, and establish connections with other members of the community in close proximity to them (Lyon, 2000; Savioli & Patuelli, 2016).

There are several examples of community-based development best practices that have been successful in involving and empowering local communities. Each of these case studies demonstrates how involving communities directly in the development process can create positive, sustainable impacts. The key to success is recognition of local knowledge, active participation, and community empowerment in the development process. This sub-chapter will discuss one of the best practices in developing community-led development based on social capital in Indonesia (Auer et al., 2020; Hrytsaienko et al., 2019).

Community-led development projects are a development model that empowers local communities by involving them in the process of designing, executing, and overseeing development initiatives that have a direct impact on their livelihoods. Hence, the involvement of community members assumes a significant role within the framework of Community-led Development Projects. The involvement of community members is an integral aspect of development and social dynamics, closely linked to the concept of social capital (Furmankiewicz et al., 2021; Veronesi et al., 2022). One example is the case study of Pujon Kidul Village, located in the Malang Regency in Indonesia, on Community-led Development, which involves the utilisation of social capital within the local community for the purpose of village development. Pujon Kidul Village has achieved notable success in enhancing its local economy by implementing a tourism village development initiative. The notion of Tourism Village entails the development and utilisation of tourism potential, which is grounded in the local expertise and community life of a certain village. The primary objective of the tourist village concept is to enhance the well-being of the indigenous population by fostering the growth of the tourism industry, all the while preserving and endorsing the local culture, environment, and traditions (Putra, 2019; Rosalina et al., 2021).

The Pujon Kidul Tourism Village has the ability to leverage its agricultural resources in order to foster its development as a tourist destination. The community was acknowledged for its sustainable tourist practices in the year 2020. The development was significantly influenced by the active participation of the Pokdarwis, a community awareness organisation. The Sawah Cafe is a prominent feature of this tourist resort, providing visitors with a rustic ambiance and a diverse menu consisting of culinary delights crafted from locally sourced agricultural produce. The establishment of a distinctive agricultural-oriented tourist attraction characterises the essence of the concept behind Pujon Kidul Village.

The utilisation of social capital can serve as a means to incentivise more community engagement in sustainable village tourism. This study highlights the significance of trust, a fundamental element of social capital, in the establishment of community networks and the promotion of non-tourism individuals' engagement. When a community exhibits a heightened level of trust, individuals perceive it as a catalyst for more collective endeavours, as it serves as the foundation for social capital. The establishment of trust among non-tourism players inside the village plays a crucial role in fostering collaboration and facilitating the attainment of program objectives. The establishment of community trust holds significant importance within the context of community-based tourism (Rahmawati et al., 2023).

The amount of trust within the village community is positively correlated with their engagement in group activities. Moreover, it promotes the facilitation of collaboration and active participation according to Prayitno and Syaifurridzal (2017). The presence of social capital in Pujon Kidul Village encourages the inclination of its residents to engage in communal endeavours and collaborate towards the advancement of the village. This is

evidenced by the existence of robust norms and beliefs, as well as broad networks among the villagers.

This case study demonstrates that inside the Pujon Kidul Tourism Village, individuals who are not actively engaged in the tourism sector possess substantial social capital, hence fostering heightened community involvement in the pursuit of village sustainability. According to Rahmawati et al. (2023), it is evident that social capital can be utilised as a strategic approach in the development of a tourist village. This is achieved by fostering community engagement and collaboration, which ultimately leads to collective advantages (Rahmawati et al., 2023).

## 4.6 Harnessing Social Capital for Effective Planning

Governments and development organisations can harness social capital for effective planning by increasing investment, both in their social capital and in creating the conditions necessary for its effective use (Pylypenko et al., 2023). Social capital is a process that requires high development costs, involves efforts at the state and regional levels, and requires considerable time. Social capital takes various forms that can arise and develop over a long period, involving the efforts of governments and development organisations. Leveraging social capital involves significant effort at various levels, including the state and regional levels, and lasts for quite a long time. Increasing collaboration between institutions, especially government institutions and social capital, is a way to foster trust in the community. When participatory processes (social capital) are well-designed, transparent, and inclusive, they can increase trust in institutions and encourage collaboration (Menzel et al., 2013).

According to Menzel et al. (2013), there are several ways to increase public trust. One example is that expectations of positive outcomes, such as agreement and implementation, are positively correlated with trust in government institutions. Additionally, providing higher process quality, characterised by well-designed, transparent, and fair participatory processes, is also positively correlated with trust in government institutions.

A good participatory process means that institutions can hold dialogue forums and consultations with the community regularly. This will provide an opportunity for the community to provide input, share views, and feel involved in the decision-making process. In addition, developing community skills and knowledge on social and economic issues can strengthen social capital. This can be done through training, workshops, and education about participation in decision-making processes. Meanwhile, a transparent participatory process means that institutions need to strive to be more transparent in their policies and decision-making processes. Information that is easily accessible to the public will help build trust and facilitate greater participation from the community. Subsequently, in fostering a fair participatory process, institutions must be committed to ensuring that all groups in society have the same opportunity to participate and benefit from this collaboration. Enhancing collaboration between institutions and social capital is a process that requires time, commitment, and concerted effort. With the right steps, institutions can foster trust in the community. This can yield significant benefits in building more inclusive, sustainable, and thriving societies.

## 4.7 Conclusion

Community engagement remains a significant mechanism for exerting influence and fostering empowerment among individuals and communities. Social capital is a concept that is widely employed across multiple academic disciplines to promote and facilitate both formal and informal engagement within communities. The concept of social capital, as posited by Bourdieu (1986), Coleman (1988), and Putnam (1993), encompasses multiple dimensions and typically encompasses both structural and cognitive components. The engagement of individuals within networks and groups within a community has the potential to enhance the accessibility of information channels, augment social support resources, and mitigate the negative consequences stemming from limited human resources or financial capital. Factors such as trust within the community, support from neighbours, happiness with the community, emotional connection to community spaces, perception of community cohesion, and overall life satisfaction are illustrative of the growing emphasis in contemporary research on the ecological context and comprehension of social capital. Based on the tenets of social capital theory, the establishment of social networks, trust, and cohesion serves as a catalyst for individuals' active engagement in local services and voluntary organisations.

Social capital plays a pivotal role in facilitating collaborative endeavours aimed at fostering the engagement of local communities. In contrast, individuals have a tendency to refrain from engaging in social activities when they experience a sense of isolation from social networks and the broader community. While social capital plays a crucial role in fostering positive social relationships and facilitating involvement, it is important to acknowledge that institutions are equally essential in converting individual social capital into organised community engagement.

## References


Abdullah, S. (2013). Potensi dan Kekuatan Modal Sosial dalam Suatu Komunitas. *SOCIUS : Jurnal Sosiologi*, *12*(1), 15–20.

Adler, P. S., & Kwon, S. W. (2002). Social capital: Prospects for a new concept. *Academy of Management Review, 27(1), 17-40.*

Aldegheishem, A. (2023). Community participation in urban planning process in Saudi Arabia: An empirical assessment. *Journal of Urban Management*.

Alesina, A., & Giuliano, P. (2015). Culture and institutions. *Journal of Economic Literature, 53(4), 898-944*.

Ardila, R. M., Nurhasanah, & Salimi, M. (2017). Pendidikan Karakter Tanggung Jawab Dan Pembelajarannya Di Sekolah. *Prosiding Seminar Nasional Inovasi Pendidikan*, 79–85.

Auer, A., Von Below, J., Nahuelhual, L., Mastrangelo, M., Gonzalez, A., Gluch, M., Vallejos, M., Staiano, L., Laterra, P., & Paruelo, J. (2020). The role of social capital and collective actions in natural capital conservation and management. *Environmental Science and Policy*, *107*, 168–178. https://doi.org/10.1016/j.envsci.2020.02.024

Barro, R. J., & McCleary, R. M. (2002). Religion and Political Economy in an International Panel. *National Bureau of Economic Research (NBER) Working Paper No. W8931. Cambridge, MA: Harvard University. Available at: Http://Ssrn.Com/Abstract= 312644*.

Bhandari, H., & Yasunobu, K. (2009). What is social capital? A comprehensive review of the concept. *Asian Journal of Social Science, 37(3), 480-510*.

Bourdieu, P. (1986). Pierre Bourdieu 1986 - The forms of capital. *Handbook of Theory and Research for the Sociology of Education*, 241–258.

Buchori, I., Zaki, A., Pangi, P., Sejati, A. W., Pramitasari, A., & Liu, Y. (2022). Adaptation strategies and community participation in government-led mitigation projects: A comparison between urban and suburban communities in Pekalongan, Indonesia. *International Journal of Disaster Risk Reduction*, *81*. https://doi.org/10.1016/j.ijdrr.2022.103271

Chairilsyah, D. (2016). Metode dan Teknik Mengajarkan Kejujuran Pada Anak Sejak Usia Dini. *Educhild*, *5*(1), 8–14.

Chang, H. N. (1997). Democracy, diversity and social capital. *National Civic Review, Vol. 86, No. 2, San Fernando, California*.

Coleman, J. (1988). Coleman, J. S. (1988). Social Capital in the Creation of Human Capital. *The American Journal of Sociology*, *94*(1988), 95–120.

Fathy, R. (2019). Modal Sosial: Konsep, Inklusivitas dan Pemberdayaan Masyarakat. *Jurnal Pemikiran Sosiologi*, *6*(1), 1. https://doi.org/10.22146/jps.v6i1.47463

Fukuyama. (1995). Trust: The Social Virtues and The Creation of Prosperity. *New York: Free Press*.

Fukuyama. (2002). Trust: Kebajikan Sosial dan Penciptaan Kemakmuran. *Angewandte Chemie International Edition, 6(11), 951–952.*, *13*, 10–27.

Fukuyama, F. (1997). *Social Capital, the Tanner lectures On Human Values Brasenose College, Oxford*.

Fukuyama, F. (2001). Social Capital and Development: The Coming Agenda. *SAIS Review*, *22*(1), 23–37. https://doi.org/10.1353/sais.2002.0009

Furmankiewicz, M., Hewitt, R. J., Kapusta, A., & Solecka, I. (2021). Climate Change Challenges and Community-Led Development Strategies: Do They Fit Together in Fisheries Regions? *Energies, 14(20), 6614*.

Haridison, A. (2004). *Modal Sosial Dalam Pembangunan Oleh. Anyualatha Haridison 1 ABSTRAK*. *4*(1990), 35–43.

Hrytsaienko, M., Hrytsaienko, H., Andrieieva, L., & Boltianska, L. (2019). The role of social capital in development of agricultural entrepreneurship. *In Modern Development Paths of Agricultural Production: Trends and Innovations (Pp. 427-440). Cham: Springer International Publishing*.

Jansen, R. J. G., Curşeu, P. L., Vermeulen, P. A. M., Geurts, J. L. A., & Gibcus, P. (2013). Information processing and strategic decision-making in small and medium-sized enterprises: The role of human and social capital in attaining decision effectiveness. *International Small Business Journal, 31(2), 192–216. Doi:10.1177/0266242611406762*.

Jousairi Hasbullah. (2006). *Social Capital (Menuju Keunggulan Budaya Manusia Indonesia)*.

Kliksberg, B. (1999). Social capital and culture: Master keys to development. *Cepal Review*.

Knack, S., & Keefer, P. (1997). Does social capital have an economic payoff? *A Cross-Country Investigation, Quarterly Journal of Economics, Vol. CXII, No. 4, Cambridge, Massachusetts, The MIT Press.*

Lyon, F. (2000). Trust, Networks and Norms: The Creation of Social Capital in Agricultural Economies in Ghana. *World Development, 28(4), 663–681. Doi:10.1016/S0305-750x(99)00146-1*.

Mamahit, Youdi ., Wangke, W. M., & Benu, N. M. (2016). Kajian Modal Sosial Pada Kelompok Tani Di Desa Tumani Kecamatan Maesaan Kabupaten Minahasa Selatan

(Kelompok Tani Esa Waya dan Kelompok Tani Sinar Mas). *Agri-Sosioekonomi*, *12*(2A), 125. https://doi.org/10.35791/agrsosek.12.2a.2016.12819

Man, D. I., & Sleman, P. (2010). *Kerjasama Guru Bimbingan Konseling , Guru Pendidikan Agama Islam Dan Guru Pendidikan Kewarganegaraan*.

Menzel, S., Buchecker, M., & Schulz, T. (2013). Forming social capital-Does participatory planning foster trust in institutions? *Journal of Environmental Management*, *131*, 351–362. https://doi.org/10.1016/j.jenvman.2013.10.010

Mukrimaa, S. S., Nurdyansyah, Fahyuni, E. F., YULIA CITRA, A., Schulz, N. D., د, غسان., Taniredja, T., Faridli, E. Miftah., & Harmianto, S. (2016). No 主観的健康感を中心とした在宅高齢者における 健康関連指標に関する共分散構造分析Title. *Jurnal Penelitian Pendidikan Guru Sekolah Dasar*, *6*(August), 128.

Pitaloka, D. L., Dimyati, D., & Purwanta, E. (2021). Peran Guru dalam Menanamkan Nilai Toleransi pada Anak Usia Dini di Indonesia. *Jurnal Obsesi : Jurnal Pendidikan Anak Usia Dini*, *5*(2), 1696–1705. https://doi.org/10.31004/obsesi.v5i2.972

Putnam, B. R. D. (1993). Social Capital and Public Life. *The American Prospect*, *4*, 35–42.

Putnam, R. D. (1993). *Making Democracy Work : Civic Traditions in Modern Italy*. Princeton University Press. https://doi.org/10.1177/0899764096251009

Putra, T. (2019). A Review on penta helix actors in village tourism development and management. *Journal of Business on Hospitality and Tourism, 5(1), 63*.

Pylypenko, H. M., Pylypenko, Y. I., Dubiei, Y. V., Solianyk, L. G., Pazynich, Y. M., Buketov, V., Smoliński, A., & Magdziarczyk, M. (2023). Social capital as a factor of innovative development. *Journal of Open Innovation: Technology, Market, and Complexity*, *9*(3). https://doi.org/10.1016/j.joitmc.2023.100118

Rahmawati, R., Prayitno, G., Firdausiyah, N., Dinanti, D., & Hayat, A., Efendi, A., & Roskruge, M. (2023). Harnessing social capital for fostering non-tourism actor involvement in sustainable tourism: A case study of an Indonesian village. *J. Urban Dev. Manag, 2(2), 69-83*.

Robert Putnam. (2000). *Bowling Alone: The Collapse and Revival of American Community*.

Rosalina, P. D., Dupre, K., & Wang, Y. (2021). Rural tourism: A systematic literature review on definitions and challenges. *Journal of Hospitality and Tourism Management, 47, 134-149*.

Savioli, M., & Patuelli, R. (2016). Social capital, institutions and policymaking. *Kiel Institute for the World Economy (IfW)*.

Stam, W., & Elfring, T. (2008). Entrepreneurial orientation and new venture performance: The moderating role of intra- and extraindustry social capital. *Academy of Management Journal 51(1): 97–111*.

Thaler, T., Attems, M. S., & Fuchs, S. (2022). Bottom-up innovations in natural hazard risk management in Austria. *International Journal of Disaster Risk Reduction, 67, 102689*.

Todaro, M. (2000). Economic Development. *London (UK): Addison-Wisley Longman, Inc*.

Veronesi, M., Algoed, L., & Hernández Torrales, M. E. (2022). Community-led development and collective land tenure for environmental justice: the case of the Caño Martín Peña community land trust, Puerto Rico. *International Journal of Urban Sustainable Development, 14(1), 388-397*.

Wang, Y. (2020). Institutional interaction and decision making in China's rural development. *Journal of Rural Studies, 76, 111-119*.

Westhead, P., Ucbasaran, D., & Wright, M. (2009). Information search and opportunity identification: The importance of prior business experience. *International Small Business Journal 27(6): 659–680*

# CHAPTER 5: MANAGEMENT OF NATURAL RESOURCES IN VILLAGES FOR SUSTAINABILITY

***Authors: Wawargita Permata Wijayanti, Aris Subagiyo, and Gunawan Prayitno***

## Abstract

An important effort to protect the environment, meet current needs, and improve the quality of life of village communities without compromising the possibilities of future generations is a form of managing natural resources in villages for sustainability. Sustainable natural resource management is a shared responsibility and requires a long-term commitment to protecting the natural environment and the welfare of village communities. This chapter consists of the concept of sustainable natural resource management covering four parts. The first part explains the role of Rural Development, Utilisation of Natural Resources, and the Sustainable Needs of Rural Communities. The second part discusses case studies in the province of Bali, Indonesia. And the third and concluding parts discuss how the community faces sustainability issues in the village. Balancing economic needs, environmental conservation and social welfare is a major challenge in managing natural resources in rural areas. Therefore, community-based and participatory approaches are important in the context of village sustainability. Integrating community perspectives and enabling them to actively participate in the management of natural resources in rural areas is key to achieving the necessary balance between economic needs, environmental conservation and social welfare.

**Keywords:** rural development, natural resources, rural communities

## 5.1 Introduction

### 5.1.1 Rural Development and Natural Resource Utilisation

Rural development has experienced rapid increase throughout the past decades, specifically in an effort towards poverty alleviation. Basically, this development is characterised by livelihood development, farmer organisations and village institutions, social and rural infrastructure, food security and finance (Chen et al., 2020). In addition, scholars emphasise that rural development is developed based on its natural resources to produce certain economic values for rural people. Although the resource plays an important role in the development, the use of this resources is full of complexity (IFAD, 2021). Education, entrepreneurship, infrastructure, sustainability, and many other elements become substantial challenges in maintaining the benefits of rural development. Another is the flow of large-scale investment for resource exploitation as well as the implementation of government policies to expand economic growth in rural areas. This contributes to the changes of rural economic structure and people's activities from agricultural activities.

As previously mentioned, it can be understood that natural resources and their uses seem to play a critical role towards the continuity of rural development. Seasonal variation, unbalanced eco-systems, low incidence, un-sustainable use, and transformation of the resources potentially have an impact towards the economic aspect of rural development (Alexander Norsworthy, 2000; Deng et al., 2022). In several studies,

*Wawargita Permata Wijayanti*, Aris Subagiyo, and Gunawan Prayitno*
**email: wawargita.pw@ub.ac.id*
https://doi.org/10.11594/futscipress31

the natural resources are commonly evaluated based on their sustainability, which describes the quantity and quality of the resources. The importance of the resources, are: forest, air, land, and sunlight which provide many alternative economic activities in rural areas. Therefore, maintaining and increasing the sustainability values of natural resources used for the rural development is one of the core goals.

The sustainability refers to the effective and efficient utilisation of natural resources, such as land, water, air, minerals, forests, fisheries, and wild flora and fauna with accordance towards maintaining future availability of ecosystem services, and providing better quality to human life. IFAD (2021) explained that the sustainability can be achieved by (1) transforming crop, livestock and irrigation sectors into efficiently managed, highly productive systems; (2) combining livelihood development with natural resources management and biodiversity conservation; (3) integrating watershed management and desertification control by means of participatory forest, land and water management planning based on sustainable land use principles; and (4) adapting agriculture, forestry and land management systems.

Natural resources utilisation has evidently generated economic value and provides greater security of natural factors, environmental conditions, and future well-being (Guo & Zhong, 2023). It is available to humans and constitutes the material base for human survival and development. Satterthwaite et al. (2010) and Fridrihsone et al. (2020) mentioned that the specific debate on the use of resources comes down to efficiency and fairness. Efficiency is a crucial factor as uncontrolled use of natural resources causes problems such as decreasing the quality of the resources themselves. In fact, natural resources are limited, therefore, the use of these natural resources should be done wisely. In addition, fairness is also essential where the utilisation of natural resources in rural areas is carried out by all rural people. It does not have to be same form of the use, at least, natural resources can be access to everyone.

### 5.1.2 Natural Resources and Rural Community Needs

In the context of rural development, there are two essential elements: natural resources and rural community needs. **Natural resources** when referring to land becomes a priority. Land is a main capital for obtaining higher economic values and achieving better welfare outcomes for rural people, as shown in Figure 5.1. This resource can be used for the development of agricultural activities, plantations, fisheries, tourism, as well as small and household industries. The use of rural land is often referred to as a natural resources-based economic activity. In this instance, land becomes a main resource to develop economic activities for increasing human well-being. A natural resource-based activity impacts significantly the condition of natural and financial assets as well as physical assets for rural people.




**Figure 5.1** Essential elements of rural development

The essence of rural development is not only restricted to structuring land utilisation, but it also repeatedly contributes to economic development of an area. On one hand, not only does this development escalate the intensity of land utilisation in the area and its surrounding, it can also increase land values (Hasanawi & Winarso, 2018; Lin & Yi, 2011). However, the use of land also often experiences obstacles related to ownership. The ownership is defined as varied rights and obligations derived from the laws which are conferred to the owner of a property to relate with other parties (Demsetz & Alchian, 1973; Rodgers, 2009).

Barzel (1997) explains that lands, including the properties established on them, are the source of livelihood of the people for their prosperity. Contrarily, they yield up their lands for the sake of development, leading to ownership by another party. In the Global-South countries, most of agricultural people rent their cultivated lands, which means that they only hold rights of appropriation on the lands under the ownership of that land by other parties. The transaction among owner and user is usually based on an informal agreement.

In addition **rural community needs** refers to providing more open, wider opportunities for village communities to carry out village development. More specifically, the needs in question are the development of rural economic activities in accordance with local resources and potential in order to improve the quality of life of village communities. Human resources (human capital) occupy a very important position and role in development as managers and actors of development who can provide benefits and improve human life and welfare. Therefore, it is necessary to identify the needs or gaps in service of the rural people and area, as well as the resources and strengths available to meet those needs. Moreover, the rural development also focuses on the capabilities of the community. It provides a framework for developing and identifying services and solutions and building communities that support the economic activities in rural areas.

## 5.2 Case Studies of Combining Community Needs and Natural Resources in the Case of the Development of Desa Purwakerti, Kabupaten Karangasem, Provinsi Bali

### 5.2.1 Land and Coastal as Primary Resources for Tourism in Desa Purwakerti

Desa Purwakerti is located in Kecamatan Abang, Kabupaten Karangasem, Provinsi Bali. This village has an area of 524.25 Ha and it is consist of 5 *dusun,* namely Bias Lantang Kaler (57.55 Ha), Bias Lantang Kelod (88.67 Ha), Babakan (174.91 Ha), Amed (56 .20 Ha), and Lebah (146.81 Ha). The location of this village is in the east coast of Bali Island which have many potential economic sectors.

Currently, Desa Purwakerti has three main sectors including agriculture/plantation, fisheries, and tourism (Profile of Desa Purwakerti, 2020). Agriculture and plantations in Desa Purwakerti have several commodities, including coconut, cashew, corn, and peanuts. However, currently the interest of the younger generation in the agricultural/plantation sector is declining and land use is moving towards development, especially in the tourism sector. This causes agricultural land in Desa Purwakerti to continue to decrease (Interview to the Head of Desa Purwakerti, 2021).

As Desa Purwakerti is located in a coastal area, this village also developed fisheries and tourism activities to obtain more economic value. Pantai Amed or Amed Beach has

the potential to attract marine tourism in the form of coral reefs and ornamental fish and has been named one of the best tours in Bali (Cahyana et al., 2018).

At the end of 1990, the marine tourism potential of Amed Beach became more widely known to foreign tourists. This led to the development of tourism facilities in early 2000. Since then, tourism can be said to be the dominant sector in Desa Purwakerti until today. This can be confirmed by 80% of community families being tourism industry players in 2021 (Interview to the Head of Desa Purwakerti, 2021).

**(1) Pantai Amed** is a very strategic place for viewing the sunrise. The most interesting attraction is the view of rows of traditional fishing boats (*jukung*). Besides being able to enjoy it directly from the beach, tourists can also see the sunrise closer from the sea. Tourist can also rent the *jukung* which can accommodate two people and one driver (Figure 5.2).



**Figure 5.2** Sunrise and rows of *jukung* on Amed Beach

**(2) Gunung Agung** or Mount Agung is one of the active volcanoes on the island of Bali which is located to the west of Amed Beach. With the strategic location of Mount Agung, views of the mountain can be easily seen from Amed Beach, adding to its tourist attraction (Figure 5.3). One of the favourite locations or spots for tourists to enjoy the view of Mount Agung is one of the stalls located on the cliff of a small hill called Sunset Point. From this location, people can also enjoy the views of the sunrise and sunset every day.



**Figure 5.3** View of Gunung Agung

**(3) Bahari Tourism.** As previously noted, Pantai Amed has the potential to attract marine tourism in the form of coral reefs and ornamental fish and has been named one of the best tourist attractions in Bali (Cahyana et al., 2018). This attracts visits from

domestic and foreign tourists to specifically enjoy the underwater views, even though the location of Amed Beach is far from the city centre.

The underwater view of Amed Beach with clear water and various kinds of coral reefs as well as the activities of various ornamental fish are added value as a tourist attraction. Types of ornamental fish that can be found are *ikan banner, kakap hitam, damselfish, tiger fish, kupu - kupu piramida,* and others. Around 20 meters from the shore of Amed there is the skeleton of a Japanese patrol ship that sank during World War II, becoming a point of interest.

Marine tourism activities that can be engaged to enjoy this underwater beauty are diving, snorkelling and freediving (skills). Moreover, the large number of fishermen on Pantai Amed shows that this place is very heavily engaged in fishing. Another tourist activity that can be done at Amed Beach is fishing in the middle of the sea. To carry out this activity, rental of traditional boats (*jukung*) and fishing equipment is provided so that tourists can ask the driver to take them to the fishing location. This activity is usually carried out in the morning as it is generally considered to be the best time for fishing (Figure 5.4).



**Figure 5.4** Bahari Tourism

**(4) Cultural attraction and yearly event** are additional attractions that can increase the interest of tourists visiting. In general, there are two annual events, namely *Pengrupukan* and *Amed Culture Festival*. The Pengerukan event is held every day before Nyepi Day in Bali. At night, Balinese people carry out the *ogoh-ogoh* procession throughout the village with the aim of a central place. This is something unique, especially for foreign tourists so that during Nyepi Day there is usually an increase in the number of tourists.

The next event is the Amed Culture Festival, which is an annual festival held in Purwakerti Village. This festival was held for the first time in 2019 and was timed to coincide with the birthday of Purwakerti Village, which is October 28. In 2020, this festival failed to take place due to the Covid-19 pandemic. This festival aims to empower people in the field of local culture. The competitions that were held included decorating the *penjor, genjek,* photo competition, *gebogan,* Balinese traditional clothing, planting coconut trees around Desa Purwakerti, procession of agricultural/plantation products, and others. The competition involved 5 traditional *dusun* in this village. The centre of the festival is held in Banjar Amed and Banjar Lebah due to the tourist attractions located in these locations. This opens opportunities for tourists to join the festival and adds to the annual event in Purwakerti (Interview to the Head of Desa Purwakerti, 2021).

The development of tourism potential in Desa Purwakerti was carried out at the initiative of the rural community by considering their locality. This village is included in the Tulamben-Amed Area which is designated as one of the 88 KSPN (National Tourism

Strategic Areas) in Indonesia (Indonesian Government Regulation Nu. 50/ year 2011). This KSPN continues to have an important influence on various aspects including economic, social, and cultural growth, empowerment of natural resources, environmental carrying capacity, and defence and security. With the establishment of the KSPN, tourism promotion programs will be further enhanced, for example the construction of amenities or infrastructure, training programs for the community as tourism industry players, and increasing organisational performance.

Related to the tourism organisation, the Government of Desa Purwakerti is still attempting to initiate POKDARWIS to help manage Pantai Amed and other attractions. However, currently there is a *Tunas Mekar Tourism Group*, namely Pantai Amed and Pantai Jemenuk. These two tourist objects have similar characteristics, starting from their attractiveness and maritime potential. The difference between these two tourist objects is the development time and Amed Beach which is richer in the beauty of maritime potential. Therefore, *Tunas Mekar Tourism Group* was formed to help manage tourism on the two beaches (Interview to the Head of Desa Purwakerti, 2021). In addition, there are also other groups such as the Diving Instructor Association throughout Kabupaten Karangasem and the Tour Guide Association throughout Kabupaten Karangasem.

### 5.2.2 What is the Impact of Rural Development on People's Livelihoods?

Rural development in Desa Purwakerti, by increasing the value of the tourism sector, provides changes to the livelihoods of rural people. Livelihoods means the capabilities, assets and activities required for a means of living: a livelihood which is sustainable can cope with and recover from stress and shocks, maintain, or enhance its capabilities and assets, and provide sustainability at the local and global levels and in the short and long term (Chambers & Conway, 1992). More specifically, livelihoods not only focus on work or occupation, but generally about how people can live. There are five components of assets, consisting of human, social, natural, physical, and financial (DFID, 2001).

In order to analyse the extent of livelihood change in rural people of Desa Purwakerti, a pentagonal asset analysis was utilised. Scoring was performed to provide an assessment of the condition of five assets. The scoring was carried out based on the results of a primary survey in the form of a questionnaire for assessing the livelihood condition of the Purwakerti rural people in 2011 and 2022. To determine the value of each asset, the survey was carried out according to sub-variable parameters on a scale of 1-5. The scores from each respondent will be displayed in the form of an average (mean) for each indicator (Figure 5.5). The total score of each asset is formulated as follows:

$$\boldsymbol{A = \frac{B1 + B2 + B3 + \cdots + Bn}{n}}$$

A : Livelihoods asset : human, social, natural, physical, and financial
B : Mean score of each sub-variables (based on indicators)
N : Number of sub-variables

To find out changes in each asset, it is done in the following way:

$$\boldsymbol{P = A_1 - A_0}$$

P : Change of livelihoods asset
A0 : Livelihood score in 2011
A1 : Livelihood score in 2012
P score can be positive or negative depends on the change of livelihoods within 10 years.

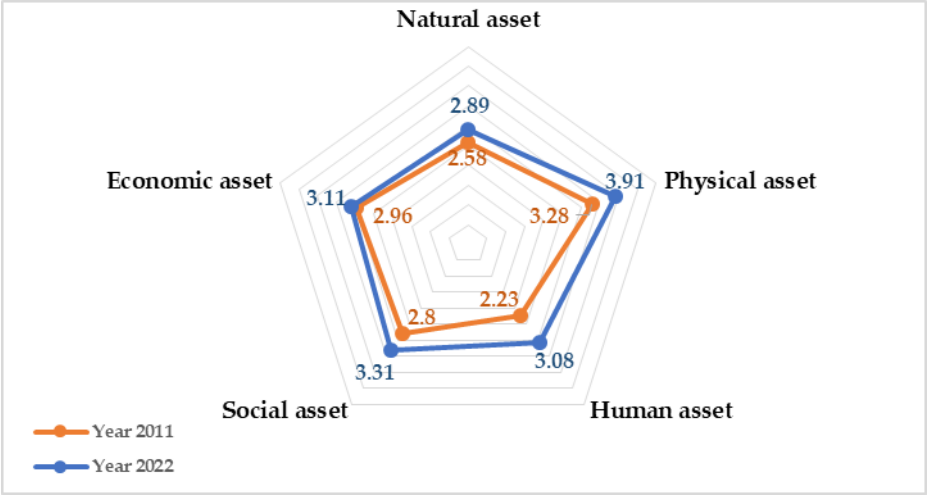



**Figure 5.5** Impact of the rural development to livelihoods of rural people in Desa Purwakerti

Based on Figure 5.5, it can be shown that there has been an increase in the livelihood conditions of the people of Desa Purwakerti from 2011 to 2022. Of the five livelihood assets, a significant increase in asset value is seen in **human assets (+0.85).** Human assets, in 2011 conditions the value of human assets is low compared to other assets. But in 2022, human assets will experience the most significant increase compared to other assets. This increase occurred because more and more people are providing higher education to their children. With the development of tourism activities, rural communities have a higher desire and ability to send their children to school. The development of tourism also encourages people to switch their livelihoods to become tourism industry players and increase their knowledge in the tourism sector. Knowledge in managing tourism is important for the whole community as it is the basis for increasing the economic value of tourism.

A significant increase in the livelihood score can be seen in **physical assets (+0.63).** The development of tourism potential in Desa Purwakerti has impacted to the Government of Kabupaten Karangasem, Bali Province, as well as the Central Government to improve accessibility services around tourist sites. In 2011 there was high damage in I Ketut Natih Street which is the main road in Purwakerti Village, as well as being a main road to tourist attractions. In 2020, road improvement to asphalt was carried out. Along with roadwork, a significant change to infrastructure has occurred in the telecommunications network. Even though the village community did not experience communication barriers in 2011, the condition of the telephone network has reached all areas evenly with the addition of 13 BTS tower units in Desa Purwakerti and surroundings. In addition, the providers that can be accessed are more diverse, enabling the public to have a variety of choices to communicate easily.

Differing from human and physical assets, **social assets** have shown no significant change. Based on the results of the questionnaire, it was found that most rural people had the perception that they had mutual trust, but mutual relations were not always formed between the village community. The people of Desa Purwakerti still have a close sense of family, helping each other and exchanging information. In 2022, more than 70% of the village community stated that they were increasingly solid in developing tourism and other economic sectors in the village. This is based upon the increasing of trust among

people. Besides that, the high enthusiasm and motivation for a better quality of life of those people increase their engagement to achieve the higher goal of rural development. Unfortunately, **economic assets** have the least significant score increase **(+0.15).** Even though there seems to be a change from 2011 to 2022, the economic conditions of the people of Desa Purwakerti still face obstacles. In 2011, there were 37.47% of the people who had an income below the Regional Minimum Income (UMK) of Kabupaten Karangasem. From all people whose income is below the UMK in 2011, 50% of them still have lower income in 2022. This shows that there has been no increase in the income class of this community group. However, there are 30% of village communities who will have an income of more than two times the minimum wage in 2022. This increase in income apparently has implications for other economic assets, namely ownership of savings and assets. Ownership of savings increased by 40% from 2011 where the majority were people with incomes above the UMK. The same condition also occurs in asset ownership, including land, deposit, or jewelry.

**Natural assets** is the natural wealth utilised by the people of Desa Purwakerti, based on marine tourism and fisheries. Previously, it was known that marine tourism in Amed Beach had been utilised from 2000 until now. This condition causes an increasing number of people to be involved in providing tourism activities to date. With 65.84% of the community stating that good use of the village's natural wealth was able to improve welfare. This further reinforces that the potential for natural wealth in Desa Purwakerti plays an important role in the welfare of the surrounding environment.

Community welfare, due to the use of natural resources, can be accessed by the entire community of Purwakerti Village, whether in the tourism industry, fishing, or other areas. Tourism industry players and fishermen can receive direct benefits in all aspects of livelihood, while other communities receive indirect benefits but still improve welfare.

In terms of land, which is the main capital in village development, there have been very significant changes. In 2011, only 21.05% of the community owned land with ownership rights that allowed for business development. However, this percentage significantly increased by 56.52% to 78.57% in 2022. People who work as tourism actors are able to buy land and develop it for tourism or invest elsewhere. However, currently agricultural land has decreased dramatically compared to 2011. This condition is caused by many young people who do not want to continue farming as their main livelihood, causing a shift in land use towards development.

## 5.3. How Rural Communities Face Sustainability Issues.

The forms of un-sustainability issues in the use of natural resources are very diverse. Community is able to adapt to the development of activities around them and fulfil basic needs by taking advantage of existing opportunities (Shen et al., 2008). Despite getting positive results from surrounding activities, there are still negative impacts that threaten sustainability (Haregeweyn et al., 2012; Luo et al., 2017). High exploitation of natural resources has negative effects on the environment and social life. Several forms of environmental quality decline include water scarcity, climate change, decreased biodiversity, and change of land cover. This of course has an impact on the sustainability of development. Sustainable development does not just discuss growth but also discusses how humans interact and utilise the environment for their welfare, both for current and future generations.

In the context of natural resources and livelihoods, threats to sustainability can take the form of trends, shocks, or seasonality (Chambers, 1992). First, **trends** in livelihoods

can have an important influence on the returns (economic or otherwise) when choosing a livelihood strategy. Trends can be predicted so that the resulting vulnerability is not as severe a shock. It refers to vulnerability related to population, resource conflicts, economic growth and inflation, politics and policy, and technological developments. Second, **shock**, is an aspect of vulnerability that can damage assets which can cause people to leave their homes and abandon existing assets (such as land). The shocks referred to in vulnerability include health problems, natural disasters, economic crises, and conflicts. Lastly, **seasonality.** Seasonal changes have an impact on livelihood assets and can influence them in positive or negative directions. There are several indicators for seasonality, such as price variations indicating food availability and production. In addition, seasonal changes affect water availability, both in canals and wells, and rainfall. It also causes disease occurrences and lack of health.

Along with the explanation mentioned, natural resource management can be planned and carried out through people's perceptions of the environment (Raymond et al., 2009). The understanding of community is an important factor in protecting the high value and utilisation of natural resources. Shereni and Saarinen (2021) stated that society experiences social and economic changes. It is related to changes of values and points of view. It is necessary to understand society's perceptions to design a strategy. Apart from that, the low social awareness of the community is a challenge in sustainable agricultural development (Tseng et al., 2019).

In the case of village development through tourism potential in Desa Purwakerti, the un-sustainability issue arises because there is still limited public awareness regarding nature protection. Environmental welfare is a lever factor because it describes the results of the use of nature on the welfare of society. Most people believe that utilising natural potential can greatly improve their welfare. However, activities related to preserving the coastal and marine environment are still limited, not carried out regularly, and there is low community involvement. An assessment of the condition of nature protection and conservation in Desa Purwakerti was carried out based on community participation in environmental conservation activities. Based on the results of interviews, environmental conservation activities in Desa Purwakerti are currently not carried out routinely, and are only carried out on major holidays depending on events from the Village Government.

In 2019, the Government of Desa Purwakerti launched routine environmental conservation activities which are one of a series of events at *"Amed Cultural Festival".* The festival is an annual routine activity in Desa Purwakerti which started in 2019. However, until now it has not been able to be held again. The form of environmental conservation activities usually carried out in Desa Purwakerti is *planting trees* or reforestation. The last tree planting activity was carried out on June 21 2021 by the Government of Desa Purwakerti to commemorate *"Bung Karno Month".*

Tourism development also poses a threat to sustainability due to an absence of optimal infrastructure management. Even though village communities already have better knowledge about waste management, activities in reducing volume from source level are still limited. In fact, it can be said to be rare, and along with the development of tourism activities, waste management has become crucial.

From the wastewater aspect, river or sea water pollution is caused by all activities in Purwakerti Village. As a result of growing economic activity, there are indications of increasing sanitation pollution. In 2011, most people had the perception that river and sea water conditions were relatively good. At that time, community activities, especially at sea, were not yet too busy so pollution could be controlled. Meanwhile, in 2022, most people stated that river/sea water conditions were classified as fair to poor with an

average percentage above 50%. Additionally, there is an increase in pollution and water quality is decreasing. This condition is impacted from the tourism and fisheries sector. Those activities can increase sea water turbidity. In the long term, it can reduce the attractiveness of marine tourism and affect the sustainability of activities in the village.

## 5.4 Conclusion

Rural poverty alleviation has grown in recent decades. This development comprises livelihoods, farmer organisations, village institutions, social and rural infrastructure, food security, and finance. Scholars state that natural resources boost rural economies. The resource is crucial to development yet difficult to utilise. Shortfalls in education, entrepreneurship, infrastructure, and sustainability slow rural growth. Governments are required to provide rural economic stimulus and enormous resource extraction investment. This affects rural agriculture and economies.

Use of natural resources drives rural development. Changing resources, imbalances, low stock, and unsustainability may hinder rural development. Sustainability research evaluates natural resource quantity and quality. Forest, air, land, and sun offer rural economic opportunities to enhance rural development.

Natural resources and social demands drive rural development. Important natural resource: land. The land fuels rural wellbeing and economic growth. Plantations, fisheries, tourism, and small companies benefit. Natural resources are extracted from rural land. Human-beneficial economic activities require land. Resource operations impact rural finances, property, and nature. Unsustainable resource consumption is complex. Community opportunities meet fundamental necessities.

Despite success, adjacent activity compromises sustainability. Overusing natural resources harms society and the environment. Water scarcity, climate change, biodiversity loss, and land cover changes impact the environment. This hurts development sustainability. Future generations' growth and environment are considered in sustainable development. Tourism in Desa Purwakerti supports unsustainable village growth due to natural conservation misunderstanding. The impact of nature on society makes environmental welfare a lever. Most believe natural resources may improve living conditions. Limited, sporadic, and lack of community-driven development reduces coastal and marine environment preservation. Of the community involvement analysis of the Desa Purwakerti's environment, interviews showed that Desa Purwakerti only conserves the environment on vacations and Village Government events.

## References


Alexander Norsworthy. (2000). *Rural development, natural resources and the environment : lessons of experience in Eastern Europe and Central Asia*. Environmentally and Socially Sustainable Development, Europe and Central Asia Region; the World Bank.

Barzel, Y. (1997). *Economic analysis of property rights*. Cambridge University Press.

Cahyana, H., Suwena, I. K., & Sudana, I. P. (2018). Karakteristik dan Motivasi Wisatawan Mancanegara Berkunjung ke Pantai Jemeluk-Amed, Desa Purwakerti, Kecamatan Abang, Karangasem. *Jurnal IPTA p-ISSN*, *6*(1), 2018.

Chambers, R. and G. C. (1992). Sustainable rural livelihoods: practical concepts for the 21st century. *IDS Discussion Paper*, *296*.

Chen, K., Long, H., Liao, L., Tu, S., & Li, T. (2020). Land use transitions and urban-rural integrated development: Theoretical framework and China's evidence. *Land Use Policy*, *92*(January), 104465. https://doi.org/10.1016/j.landusepol.2020.104465

Demsetz, H., & Alchian, A. (1973). The Property Right Paradigm. *The Journal of Economic History*, *33*(1), 16–27.

Deng, X., Wang, G., Song, W., Chen, M., Liu, Y., Sun, Z., Dong, J., Yue, T., & Shi, W. (2022). An Analytical Framework on Utilizing Natural Resources and Promoting Urban–Rural Development for Increasing Farmers' Income Through Industrial Development in Rural China. *Frontiers in Environmental Science*, *10*(April), 1–10. https://doi.org/10.3389/fenvs.2022.865883

Fridrihsone, A., Romagnoli, F., & Cabulis, U. (2020). Environmental life cycle assessment of rapeseed and rapeseed oil produced in Northern Europe: A Latvian case study. *Sustainability (Switzerland)*, *12*(14). https://doi.org/10.3390/su12145699

Guo, Y., & Zhong, W. (2023). Rural Transformation Development and Its Influencing Factors in China's Poverty-Stricken Areas: A Case Study of Yanshan-Taihang Mountains. *Land*, *12*(5). https://doi.org/10.3390/land12051080

Haregeweyn, N., Fikadu, G., Tsunekawa, A., Tsubo, M., & Meshesha, D. T. (2012). The dynamics of urban expansion and its impacts on land use/land cover change and small-scale farmers living near the urban fringe: A case study of Bahir Dar, Ethiopia. *Landscape and Urban Planning*, *106*(2), 149–157. https://doi.org/10.1016/j.landurbplan.2012.02.016

Hasanawi, A., & Winarso, H. (2018). Land-price dynamics surrounding large-scale land development of Technopolis Gedebage, Bandung, Indonesia. *IOP Conference Series: Earth and Environmental Science*, *158*(1), 1–13. https://doi.org/10.1088/1755-1315/158/1/012011

(IFAD), I. F. for A. D. (2021). Transforming food systems for rural prosperity. In *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.3930076

Lin, G. C. S., & Yi, F. (2011). Urbanization of capital or capitalization on urban land? land development and local public finance in urbanizing China. *Urban Geography*, *32*(1), 50–79. https://doi.org/10.2747/0272-3638.32.1.50

Luo, X. S., Muleta, D., Hu, Z., Tang, H., Zhao, Z., Shen, S., & Lee, B. L. (2017). Inclusive development and agricultural adaptation to climate change. *Current Opinion in Environmental Sustainability*, *24*, 78–83. https://doi.org/10.1016/j.cosust.2017.02.004

Raymond, C. M., Bryan, B. A., MacDonald, D. H., Cast, A., Strathearn, S., Grandgirard, A., & Kalivas, T. (2009). Mapping community values for natural capital and ecosystem services. *Ecological Economics*, *68*(5), 1301–1315. https://doi.org/10.1016/j.ecolecon.2008.12.006

Rodgers, C. (2009). Property rights, land use and the rural environment: A case for Reform. *Land Use Policy*, *26*, 134–141.

Satterthwaite, D., McGranahan, G., & Tacoli, C. (2010). Urbanization and its implications for food and farming. *Philosophical Transactions of the Royal Society B: Biological Sciences*, *365*(1554), 2809–2820. https://doi.org/10.1098/rstb.2010.0136

Shen, F., Hughey, K. F. D., & Simmons, D. G. (2008). Connecting the sustainable livelihoods approach and tourism: A review of the literature. *Journal of Hospitality and Tourism Management*, *15*(1), 19–31. https://doi.org/10.1375/jhtm.15.19

Shereni, N. C., & Saarinen, J. (2021). Community perceptions on the benefits and challenges of community-based natural resources management in Zimbabwe.

*Development Southern Africa*, *38*(6), 879–895. https://doi.org/10.1080/0376835X.2020.1796599

Tseng, M. L., Lin, C., Remen Lin, C. W., Wu, K. J., & Sriphon, T. (2019). Ecotourism development in Thailand: Community participation leads to the value of attractions using linguistic preferences. *Journal of Cleaner Production*, *231*, 1319–1329. https://doi.org/10.1016/j.jclepro.2019.05.305

# CHAPTER 6: VILLAGE COMMUNITY EMPOWERMENT THROUGH STRENGTHENING SOCIAL CAPITAL

***Authors: Gunawan Prayitno, Aris Subagiyo, and Agus Dwi Wicaksono***

## Abstract

Empowering village communities through strengthening social capital is an approach that focuses on strengthening social relationships and networks within village communities to improve their abilities in decision making, problem solving and resource management. Social capital refers to the social networks, norms, and values that enable individuals and groups to work together to achieve common goals. Strengthening social capital not only improves the quality of life of village communities, but also helps create a more sustainable environment and supports inclusive economic development in villages. This approach encourages people to become more independent and active in overcoming the challenges and opportunities they face. This chapter discusses empowering village communities through strengthening social capital, covering seven parts. The first and second parts discuss the introduction and understanding of social capital in village communities, which refers to the values that exist in a community that influence relationships and interactions between community members. The third part discusses the Challenges of Village Community Social Capital, and the fourth discusses the Strategy for Strengthening Village Social Capital. In discussing social capital challenges and strategies, it is important to understand the context of village communities in depth, involving the community in making policies and programs that influence village community social capital. The fifth part discusses Social Capital Empowerment Tools and Approaches. And the sixth and seventh parts are conclusions and examples of successful case studies in strengthening social capital carried out by village communities in Indonesia.

**Keywords:** social capital, villagers, community empowerment

## 6.1 Introduction

Social capital is a communal asset that exhibits a perpetual nature, persisting despite its ongoing utilisation, and exhibiting a propensity for expansion. On the contrary, failure to utilise social capital will result in its deterioration. The fundamental principle behind the concept of social capital is the cultivation of trust, establishment of norms, and formation of social networks. The Asean Economic Community (AEC) is a regional initiative aimed at establishing a free market in Southeast Asia. This endeavour has been implemented gradually since the ASEAN Summit in Singapore in 1992. The primary objective of the development of the ASEAN Economic Community (AEC) is to enhance economic stability within the ASEAN area. It is anticipated that the AEC will effectively address economic challenges encountered by member countries within ASEAN. The Middle East and Africa (MEA) region has demonstrated a consistent trend of fostering economic integration within the Association of Southeast Asian Nations (ASEAN) by establishing a framework for free trade or facilitating the establishment of free trade agreements among ASEAN member states. The ASEAN member states, including Indonesia, have reached a consensus on an agreement pertaining to the establishment of

*Gunawan Prayitno*, Aris Subagiyo, and Agus Dwi Wicaksono*
**email: gunawan_p@ub.ac.id*
https://doi.org/10.11594/futscipress32

the ASEAN Economic Community. The phrase MEA, which is prevalent in Indonesia, essentially refers to the relationship between the AEC and the MEA.

The AEC agreement entails several consequences for ASEAN countries, including the facilitation of a seamless movement of products, the influence of unrestricted service flow, the ramifications of unhindered investment flow, the effects of skilled labour mobility, and the implications of unrestricted capital flow. Undoubtedly, these factors can provide both advantageous and detrimental outcomes for the Indonesian economy. In this scenario, it is imperative for Indonesia to strategise its approach towards harnessing the potential of the 2015 ASEAN Economic Community (AEC) and enhancing its own competencies. By doing so, Indonesia aims to ensure its self-sufficiency and capitalise on the opportunities presented within the ASEAN community.

The importance of social capital is heightened in the context of globalisation and the ASEAN Economic Community (AEC), since it enables intimate relationships and cooperation across several domains to effectively address the consequences of these phenomena. Social connections play a crucial role in the functioning of social systems, with kinship serving as a significant determinant of the strength and prevalence of these connections within a given community. Social ties are present within the many economic, social, and political interconnections, and it is widely acknowledged that these social links exert a significant influence on the functioning of both markets and the state. The advancements in the period of globalisation and the establishment of the ASEAN Economic Community (AEC) have undoubtedly had an impact on various dimensions, including the economy, society, and politics. Consequently, it is imperative to enhance interpersonal connections and foster stronger social bonds.

The presence of robust social capital, characterised by trust, norms, and social networks, plays a significant role in shaping the effects of globalisation and the ASEAN Economic Community (AEC) on various aspects such as the unrestricted movement of goods, services, investment, skilled labour, and capital within ASEAN countries. These effects can be effectively addressed through collaborative relationships and social ties between the community and the government.

## 6.2. Understanding Social Capital in Village Communities

Social capital, as examined in sociological research, refers to the inherent potential possessed by individuals in the form of their ideas, values, norms, and social networks. Each individual possesses this potential, which can be effectively harnessed to address and overcome the social challenges they encounter. The concept of social capital pertains to the capacity of individuals within a collective or community to collaborate effectively in order to establish a network that facilitates the attainment of shared objectives. Social capital encompasses the shared values and standards that are widely embraced and practiced by individuals within a given society, exerting a direct or indirect influence on the well-being of individuals and the long-term viability of the community.

The current conceptualisation of social capital mostly draws upon the perspectives of three prominent social scientists, namely Pierre Bourdieu, James Coleman, and Robert Putnam. According to Bourdieu (1986), social capital can be defined as the combined collection of tangible and potential resources that are connected to the possession of a stable network of relationships, which may be more or less formalised within a group. This network provides its members with the support of collectively owned assets, serving as a form of credential that grants them access to various forms of recognition and

advantages. In this context, social capital refers to the phenomenon wherein individuals leverage their affiliation with a particular society to attain economic benefits.

This conceptualisation situates social capital within the context of the economic sphere. According to Coleman (1999), social capital refers to the capacity of individuals to collaborate effectively within diverse groups and organisations with the aim of attaining shared objectives. According to Putnam (1993), social capital refers to the collective attributes of social organisations, including trust, norms (such as reciprocity), and networks (consisting of community links). These attributes have the potential to enhance societal efficiency by enabling coordination and collaboration for the mutual advantage of everyone involved. The potency of social capital has the potential to serve as a foundation for cultivating social assets, placing greater focus on the significance of initiative, creativity, and community engagement across the entirety of the developmental process. The concept of social capital encompasses the various elements that contribute to the cohesion and collective pursuit of societal objectives. It encompasses the shared values and standards that develop and are upheld within a given society.

According to Putnam (1993), the dimensions that exert the greatest influence in determining social capital are as follows:

Social capital is an important aspect closely related to community empowerment. In social capital there are elements such as mutual trust (trust), norms, and networks that have a role in solving common problems (Subagyo & Legowo, 2021). Elements of social capital have a role in overcoming common problems in order to achieve successful community empowerment in a village. The existence of an element of trust in village development is an implementation of social capital in society. Trust, norms and networks that exist in a society are the basis for the development of social relations that are more productive and provide more benefits to its citizens. Mutual trust is basically a root for the development of a social relationship. Through this sense of trust, a person has certain expectations of the people he trusts (Bahrianoor, 2020). In social life, trust grows and develops in a pattern of relations between citizens that are kinship, kinship relations and relationships that emphasise trust in institutions which are carried out intensively on a daily basis. Mutual trust among members of the community has created a sense of security and peace in the lives of its citizens. Social relations and mutual trust that grow in the community can become the foundation for village development to be carried out. Village development that is based on mutual trust between the community and the government, the results of this development will also have a positive impact on all elements of society. The government as the highest authority in the development of a village must be able to foster the trust of the whole community in the government. With the trust of the community and development that involves the role of the community in a participatory manner, development based on mutual trust can be achieved. The development of mutual trust in a community will also have a positive impact on the government system and community life in a village.

The development of tourism is currently very promising and provides many benefits for the government, the community and the private sector. Tourism is a sector that is considered very profitable to develop and tourism also "aims to reduce poverty, preserve nature, the environment and resources, develop culture, improve the nation's image and strengthen relations with other countries by visiting tourists between countries (Latifah, 2020). The social impact arising from tourist visits causes social interaction between tourists and the local community which can result in changes in patterns or values of people's lives concerning various social, behavioural, religious, moral and language

changes. Changes in attitudes and lifestyles in society can be seen from their behaviour which tends to be consumptive. In addition to developing tourism, globalisation in this increasingly modern era also has an impact on the social community in the village.

## 6.3. Challenges to Social Capital in Village Communities

### 6.3.1 Factors Affecting Social Capital Erosion and Identifying Changing Patterns of Social Relations in Villages

Social capital is considered more as an obligation for society. Social capital can be said to be degenerate when working on an aspect does not pay attention to human dignity. The existence of globalisation is also said to be one of the factors in the decline of social capital. Ritzer (2003), stated that a society that is experiencing globalisation often face dilemmas. The meaning of the statement is that globalisation can spread not only important aspects throughout the world, but also elements of consumerism that may be considered trivial. There are four principles that support economic development that is considered rational, namely efficiency, predictability, emphasis on quantity and quality, and replacement of non-human technology with human technology. According to Ritzer, this form of rationality tends to produce paradoxes, where something that should be rational can become irrational (Santoso, 2020).

Social capital has a function as an adhesive for each individual in the form of norms, beliefs and networks. This causes mutually beneficial cooperation to achieve common goals. There are several elements of social capital, namely trust as a form of willingness to take risks in social relations that are believed to be confident. In addition, there is participation in social networks which is an ability possessed by community members to unite themselves in a pattern of synergistic relationships, this is based on the principles of volunteerism, equality, freedom and civility. Then there is an exchange of kindness which is not a form of instantaneous exchange. Furthermore, there are social norms that are quite important in controlling the forms of behaviour that grow in society, and finally, social values which are ideas that have been passed down from generation to generation in society and are considered correct and used as a reference in acting. Changes in social capital are not far from the elements of social capital described above. Changes in social capital are based on changes in beliefs, values or norms, and changes in community participation or roles (Harahap et al., 2016).

### 6.3.2 The Role of Information Flow and Technology in Social Capital Changes

The era of digitalisation has entered civilisation. The existence of information and communication technology for development is a use that aims to build/improve an area. Social capital as the main topic in the discussion in this chapter is also useful to see the effects of the implementation of information and communication technology on society. There are several dimensions of social capital and their respective implementations that are related to one another. First, there is a sense of belonging which is an important component for the dissemination of information. The second is a network that can be used as an attraction for the implementation of information and communication technology. Through the internet, communication becomes faster and easier, the internet can unite several people to participate in exchanging ideas and innovations (Alfandya & Wahid, 2020).

There are 3 impacts of implementing information and communication technology with social capital, namely bonding, bridging, and linking. Bonding can be in the form of community relations within a village, the use of technology can be in the form of using social media to market the village and its existing potential. Furthermore, there is bridging which is an opportunity that can be utilised by the community to reach out to people from outside the village. Finally, there is linking which makes it easier to do a letter management (Alfandya & Wahid, 2020).

# 6.4 Strategies for Strengthening Social Capital in Villages

## 6.4.1 Fostering Trust and Cooperation in Community Relations and Preserving Village Values and Social Norms

Trust according to Prusak and Cohen (2001) is built because of cooperation in a team or group, as well as in building trust in the development of a society. The existence of a relationship of mutual trust towards others will foster a sense of responsibility and mutual respect between people so that a reciprocal relationship will emerge between fellow individuals who trust each other. Viewed from the regional aspect, a relationship of mutual trust will also lead to interactions between the community and stakeholders in a development (Aprilia et al., 2023).

Social capital is a concept that is widely used in a development policy to determine resources in the form of assets that will be used strategically for certain groups (Wong, 2003). According to Putnam et al. (1994), social capital is an important element in economic development that can create prosperity. Based on research by Tanza (1977), households living in rural areas with high social capital will also have high income. Individuals in a society who have more access to information will coordinate more with other individuals so that there will be cooperation between individuals and communities that trust each other, providing for ongoing collaboration (Dasgupta, 1988). With this cooperative relationship, a relationship of mutual trust and interaction between individuals and society will be created that will be ongoing. Social capital is very closely related to the context of people's livelihoods which is the social glue in achieving sustainable development.

In a village community, a relationship of mutual trust is very much needed in a village development program which requires the participation of the village community to create development success. With a relationship of mutual trust, there will be efforts from the community to create cooperative relationships so that village development will be successful. According to Cleaver (2005), social capital owned by the community will create community collective action to participate in decision making and monitor the government or institutions so that they are better able to create a sense of tolerance among others.

Community collective action will also foster local wisdom that forms social capital owned by the community. Various things can grow social capital owned by the community (trust, norms, and cooperative networks to community collective action). To increase community social capital, community empowerment is needed, especially at the rural level (Singgalen, 2020). The village community is very closely related to local wisdom and culture, the traditional values of the existing community are very important to preserve. With the relationship and also the customary norms that are owned, it will increase the collective action of the community in the form of mutual cooperation which is usually carried out by the village community.

### 6.4.2 Promoting Inclusivity and Community Participation

Achieving success in sustainable development requires community involvement as an important element. Community participation and collective action can build social capital (Carter et al., 2022). The more active the involvement of the community and the degree of social capital engaged will affect the active role of the village community in village development, so that the improved economic welfare of the village community will be realised. In relation to economic welfare, social capital will encourage the community to foster a sense of locally-based entrepreneurship (Singgalen, 2020).

In some areas the strengthening and formation of social capital is carried out in a variety of different ways. One example is the formation of social capital by the people of Limau, East Halmahera, Indonesia, which is formed and strengthened based on their traditions. Based on the conflict issues that have occurred in East Halmahera Regency, the community was able to prevent conflicts from occurring in Limau village using the Seri Kodoba tradition which has the concept of a continuous life between the body and the spirit. From the traditions and local wisdom that is present, a cooperative relationship exists so that trust, norms and social networks may be formed.

The success of a development or conflict resolution in resolving problems is determined by the socio-cultural aspects of the community and each is determined by the socio-cultural aspects of the community and also each community empowerment program (Singgalen, 2020). Community involvement in development is a form of synergistic activity carried out by stakeholders in achieving common goals.

## 6.5. Tools and Approaches for Empowering Social Capital

### 6.5.1 Leveraging Traditional and Modern Communication Channels

Effective communication has a vital role in fostering cooperative relationships within a society, since it facilitates the transmission of information, both through direct and indirect means. The community extensively utilises many communication methods to facilitate effective communication and foster collaboration between those involved. Presently, information technology plays a significant role in facilitating access to information (Wang et al., 2021). The digitisation of technology is necessary in order to facilitate its accessibility to rural areas. This accessibility enables rural people to obtain information pertaining to public opinion, news, global situations, and various other subjects.

The field of information technology exhibits a strong connection to social capital, giving rise to two distinct perspectives in examining the interplay between information technology and social capital. The first views utilisation of information technology as likely to impede the establishment and advancement of social capital due to its reliance on face-to-face communication and interaction, which are key components in fostering traditional social capital. In the present era, the advancement of remote information technology is anticipated to have a mitigating effect on the intensity of face-to-face interactions among individuals (Leyden, 2003). This viewpoint posits that prolonged utilisation of information technology will diminish individuals' inclination to engage actively in social interactions and communication.

An alternative perspective posits that the proliferation of information technology will augment the social capital possessed by people or groups, hence exerting a constructive influence on the development of social capital. The utilisation of information technology

and internet network platforms facilitates the establishment of networks, leading to the proliferation of new contacts inside virtual spaces (Sánchez-Arrieta et al., 2021).

According to a study conducted by (Katz, 2003), the utilisation of the internet network is expected to enhance the level of engagement and confidence among internet users. The utilisation of a virtual platform for interpersonal communication has the potential to enhance the level of connectedness among persons, while simultaneously minimising the expenses associated with the establishment of social capital.

### 6.5.2 Community-Based Initiatives for Social Capital Strengthening

Social capital can be conceptualised as the cohesive force that binds a community together, resulting from the interactions and connections between individuals and the community. The promotion of community empowerment, particularly in rural regions, will contribute to the development of their social capital. Based on Coleman's findings (1990). According to the author, social capital is not a singular object, but rather comprises several entities that share common traits and encompass multiple aspects of social structure. These entities play a role in enabling individuals to engage in actions within that framework.

The assessment of social capital at the village level has both qualitative and quantitative dimensions, which are determined by the extent of community participation in various groups and the level of social trust. These factors contribute positively to the process of empowering development (Narayan & Cassidy, 2001). According to Brehm and Rahn (1997), personal ties have the potential to enhance community engagement within groups or politics. Social trust is a fundamental aspect of social capital that encompasses intricate sub-dimensions, necessitating the inclusion of multiple components in order to assess the extent of public trust (Yokoyama, 2006). Social trust has a crucial role in enhancing the well-being of individuals within the context of socio-economic growth at the community level.

Collective action can be understood as an outcome of social capital, which encompasses elements such as social trust, norms, and cooperative networks that are collectively possessed by a certain community. The possession of social capital by a community serves as the primary resource for the community to undertake proactive measures and engage in collective endeavours pertaining to development policies (Woolcock & Narayan, 2000). Numerous studies have demonstrated that the establishment of norms and organisations through collective action and community efforts contributes to the development of social capital. Consequently, collective action emerges as a significant indication in the formation of social capital.

### 6.5.3 Collaborating with Stakeholders for Effective Empowerment

In development both in urban and rural areas, collaboration between stakeholders from the government, non-governmental organisations, the private sector, and the community greatly influences the success of empowerment in a development program (Woolcock & Narayan, 2000). The success of empowerment activities has become a model in other developments carried out especially in rural areas. The existence of a community empowerment approach in empowerment activities will develop institutional capacity and also develop assets owned.

Empowerment and political action are dimensions of social capital that can increase access to networks and groups and thereby influence the outcomes of broader development. Collaboration with stakeholders will build trust from the community with

other parties, so that it will create active community participation. Collaboration with stakeholders is determined by various factors. These factors can later improve and advance the results of good collaboration (Bramwell & Sharman, 1999). Several determinants of collaboration with stakeholders such as interdependence, transparency, shared goals and responsibilities, trust, strength, participation of all parties, organisational support, shared commitment, shared benefits, reciprocal relationships, and clear information (Wondirad et al., 2020). Effective stakeholder collaboration will also build community-based development practices, especially in rural areas (Diamantis, 2018).

## 6.6 Case Studies of Successful Social Capital Strengthening

### 6.6.1 Showcasing Villages with Resilient Social Capital

Various studies on the resilience of social capital are essential for developing rural areas that can encourage collective action of rural communities (Nugraha et al., 2021). Elements of social capital in rural communities consisting of social norms, beliefs and social networks can build community collective action when responding to crises (Kusumastuti, 2016). Research on social capital that facilitates collective action to create a crisis-resilient society in the Pujon Kidul Tourism Village shows that social capital is the main capital in mobilising the community to take collective action initiatives in dealing with pandemics as crises arise. This collective action is a form of individual concern for other individuals in dealing with a pandemic. The results of this study concluded that the pattern of adaptation carried out by the people of Pujon Kidul Village in dealing with a pandemic became collective action or action supported by their social capital (Prayitno et al., 2022). Apart from Pujon Kidul Village, there is also Bangelan Village which is a tourist village located in Malang Regency with agricultural potential that is utilised as a tourist attraction. However, the existence of a pandemic reduced the number of tourist visits in the two villages, so that it had an impact on the socio-economic community due to activity policies (Auliah et al., 2022).

During the pandemic, Bangelan Village and Pujon Kidul Village carried out a cooperative relationship between the communities. In Pujon Kidul Village, villagers cooperate without prioritising personal matters. To encourage sustainable tourism activities, the people of Pujon Kidul Village have the same commitment and goals, even though there has been a decrease in the number of tourists during the pandemic, the community continues to carry out economic recovery through agricultural activities related to the tourism sector, such as processing agricultural products which can be channeled to the tourism sector. This was done to increase added value and income during the pandemic so that the people of Pujon Kidul did not depend solely on the cattle breeding sector which was the main commodity in the village.

When compared to Pujon Kidul Village, the social capital of the community in Bangelan Village is illustrated by the network of cooperation carried out to process the village's leading commodity, namely coffee. The Bangelan Village community processes superior commodities into finished products that can be marketed to various tourist attractions. So that during a pandemic, the people in the two villages did not depend solely on the tourism sector to survive during the pandemic. Social capital in the two villages is influenced by the dimensions of trust, networks and social norms adopted, the relationship of trust between communities will increase the willingness of the community to cooperate based on their social norms (Auliah et al., 2022). Therefore,

social capital is an important asset that can influence people's actions in dealing with shocks (Nugraha et al., 2021).

### 6.6.2 Learning from Community Empowerment Initiatives

The existence of community initiatives or collective actions can increase the sustainability of development programs (Coy et al., 2021). The existence of community involvement in empowerment will provide opportunities for awareness of community openness toward building innovation, cooperation networks, and positive relationships. Innovation is one of the more important things needed in empowerment activities because it can increase transformation to create a better economic life, thereby building the capacity of the community (Beyene et al., 2018).

Various social factors that can influence community empowerment consist of two primary factors. The first factor is influenced by the holders of power and the attitudes of the community (Beyene et al., 2018). The influence of the power holders becomes a barrier when the power holders prevent people from accessing assets and resources or when people go against norms (Partington & Totten, 2012). Poor efforts to empower people can strengthen the influence of power holders to undermine empowerment itself (Siankwilimba et al., 2023). Based on case studies of existing empowerment activities, the role of stakeholders needs to be increased in order to increase public trust so that cooperative relationships will be established. The aim is to increase action initiatives and collective actions of the community so that they are able to improve their standard of living.

## 6.7 Conclusion

The implementation of social capital in rural communities is related to village empowerment programs. To increase community social capital, village community empowerment is needed, where social capital is very closely related to local wisdom and community culture. The relationship and also the customary norms that are developed will increase the collective action of the community in the form of mutual cooperation which is usually carried out by the village community. Social capital possessed by the community will create a collective action of the community to participate in every stage of development such as decision making in the evaluation stage of development programs to create better and more sustainable program implementation.

Even so, there are still many challenges experienced by rural areas due to globalisation. These challenges include population decline, unemployment, limited access to services, and poverty. Various policies were formed to encourage the welfare of rural communities such as village community empowerment policies. This policy is realised by community-led development programs that aim to develop local community abilities to respond well to change. To build community participation in empowerment programs, it is necessary to intervene in the community through stimulation of governance relationships that include desires, interests and also a willingness to participate equally. The success of empowerment activities has become a model in other developments carried out especially in rural areas. The community empowerment approach in development programs will develop institutional capacity and also develop assets owned by village communities. Empowerment and political action are dimensions of social capital that can increase access to networks and groups thereby influencing development outcomes.

# References


Alfandya, & Fathul Wahid. (2020). Peran Modal Sosial Dalam Keberhasilan Inisiatif Teknologi Informasi Dan Komunikasi Untuk Pembangunan. *JIPI*, *05*(1), 56–66.

Aprilia, E., Prayitno, G., Usman, F., Biloshkurska, N. V., Siankwilimba, E., & Simamba, H. (2023). Social Capital and Community Participation in the Development of the Aquaculture Center in Soko Village-Indonesia. *Regional and Rural Studies*, *1*(1), 6–14. https://doi.org/10.21776/rrs.v1i1.3

Auliah, A., Prayitno, G., Ari, I. R. D., Rahmawati, Wardani, L. E., & Meidiana, C. (2022). The Role of Social Capital Facing Pandemic COVID-19 in Tourism Village to Support Sustainable Agriculture (Empirical Evidence from Two Tourism Villages in Indonesia). *Economies*, *10*(12). https://doi.org/10.3390/economies10120320

Beyene, S., Regassa, T. H., Legesse, B., Mamo, M., & Tadesse, T. (2018). Empowerment and tech adoption: Introducing the treadle pump triggers farmers' innovation in eastern Ethiopia. *Sustainability (Switzerland)*, *10*(9). https://doi.org/10.3390/su10093268

Bramwell, B., & Sharman, A. (1999). Collaboration In Local Tourism Policymaking. In *Annals of Tourism Research* (Vol. 26, Issue 2).

Brehm, J., & Rahn, W. (1997). Individual-Level Evidence for the Causes and Consequences of Social Capital. In *Source: American Journal of Political Science* (Vol. 41, Issue 3).

Carter, L., Cosijn, M., Williams, L. J., Chakraborty, A., & Kar, S. (2022). Including marginalised voices in agricultural development processes using an ethical community engagement framework in West Bengal, India. *Sustainability Science*, *17*(2), 485–496. https://doi.org/10.1007/s11625-021-01055-1

Cleaver, F. (2005). The inequality of social capital and the reproduction of chronic poverty. *World Development*, *33*(6), 893–906. https://doi.org/10.1016/j.worlddev.2004.09.015

Coy, D., Malekpour, S., Saeri, A. K., & Dargaville, R. (2021). Rethinking community empowerment in the energy transformation: A critical review of the definitions, drivers and outcomes. *Energy Research and Social Science*, *72*. https://doi.org/10.1016/j.erss.2020.101871

Dasgupta, P. (1988). *Trust as a Commodity*. https://www.researchgate.net/publication/2485739

Diamantis, D. (2018). Stakeholder ecotourism management: exchanges, coordination's and adaptations. In *Journal of Ecotourism* (Vol. 17, Issue 3, pp. 203–205). Routledge. https://doi.org/10.1080/14724049.2018.1502122

Harahap, Y., Dwiyani, N., Volyana, D., FDambudi, R., Rahmatullah, & P., W. (2016). *Pengertian_Bentuk_Unsur_Fungsi_Perubahan*.

Katz, J. E. (2003). Social Consequences of Internet Use: Access, Involvement and Interaction. *Info*, *5*(4), 46–46. https://doi.org/10.1108/14636690310495274

Kusumastuti, A. (2016). Modal Sosial dan Mekanisme Adaptasi Masyarakat Pedesaan dalam Pengelolaan dan Pembangunan Infrastruktur. *Jurnal Sosiologi*, *20*(1), 1–17. https://scholarhub.ui.ac.id/mjs/vol20/iss1/6

Leyden, K. M. (2003). Social Capital and the Built Environment: The Importance of Walkable Neighborhoods. *American Journal of Public Health*, *93*(9), 1546–1551. https://doi.org/10.2105/AJPH.93.9.1546

Narayan, D., & Cassidy, M. F. (2001). A Dimensional Approach To Measuring Social Capital: Development And Validation Of A Social Capital Inventory. *Current Sociology*, *49*(2), 59–102. https://doi.org/10.1177/0011392101049002006

Nugraha, A. T., Prayitno, G., Hasyim, A. W., & Roziqin, F. (2021). Social capital, collective action, and the development of agritourism for sustainable agriculture in rural Indonesia. *Evergreen*, *8*(1), 1–12. https://doi.org/10.5109/4372255

Partington, J., & Totten, M. (2012). Community sports projects and effective community empowerment: A case study in Rochdale. *Managing Leisure*, *17*(1), 29–46. https://doi.org/10.1080/13606719.2011.638205

Prayitno, G., Hayat, A., Efendi, A., Auliah, A., & Dinanti, D. (2022). Structural Model of Community Social Capital for Enhancing Rural Communities Adaptation against the COVID-19 Pandemic: Empirical Evidence from Pujon Kidul Tourism Village, Malang Regency, Indonesia. *Sustainability (Switzerland)*, *14*(19). https://doi.org/10.3390/su141912949

Prusak, L., & Cohen, D. (2001). *How to Invest in Social Capital*.

Putnam, B. R. D. (1993). Social Capital and Public Life. *The American Prospect*, *4*, 35–42.

Putnam, R. D., Leonardi, R., & Nonetti, R. Y. (1994). *Making Democracy Work*. Princeton University Press. https://doi.org/10.2307/J.CTT7S8R7

Sánchez-Arrieta, N., González, R. A., Cañabate, A., & Sabate, F. (2021). Social capital on social networking sites: A social network perspective. In *Sustainability (Switzerland)* (Vol. 13, Issue 9). MDPI AG. https://doi.org/10.3390/su13095147

Santoso, T. (2020). *Memahami Modal Sosial CORE View* (I). Pustaka Saga.

Siankwilimba, E., Sharma, B., & Hoque, M. E. (2023). Polysaccharides for Agricultural Applications: A Growing Presence on the Farms. In Polysaccharides (pp. 263-286). In Sharma, B., & Hoque, M. E. (Eds.). Polysaccharides: Advanced Polymeric Materials. CRC Press.

Singgalen, Y. A. (2020). INTENSIFICATION OF SOCIAL CAPITAL THROUGH RITUAL CAPITAL IN INDONESIA Intensifikasi Modal Sosial melalui Modal Ritual di Indonesia. *Jurnal Sosiologi Pedesaan*, *08*(01), 82–104. https://doi.org/10.22500/8202029421

Wang, C., Zhang, T., Xu, W., Ruan, H., & Tang, J. (2021). Social capital, technological empowerment, and resilience in rural china. *International Journal of Environmental Research and Public Health*, *18*(22). https://doi.org/10.3390/ijerph182211883

Wondirad, A., Tolkach, D., & King, B. (2020). Stakeholder collaboration as a major factor for sustainable ecotourism development in developing countries. *Tourism Management*, *78*. https://doi.org/10.1016/j.tourman.2019.104024

Wong, K. fu. (2003). Empowerment as a panacea for poverty - old wine in new bottles? Reflections on the World Bank's conception of power. *Progress in Development Studies*, *3*(4), 307–322. https://doi.org/10.1191/1464993403ps067oa

Woolcock, M., & Narayan, D. (2000). Social Capital: Implications for Development Theory, Research, and Policy. *The World Bank*, *15*(2), 225–249. http://wbro.oxfordjournals.org/

Yokoyama, S. (2006). *Social Capital and Community Development Series of Study on Rural Development Issues View project SATREPS Madagascar View project*. https://www.researchgate.net/publication/270279699

# CHAPTER 7: VILLAGE-BASED DISASTER MITIGATION

***Authors: Fadly Usman, Aris Subagiyo, and Turniningtyas Ayu Rachmawati***

## Abstract

Village-based disaster mitigation is an approach that aims to reduce the risk and impact of disasters at the village level through the active involvement of village communities. This approach recognises that villages are often the first level affected by disasters and that village communities have local knowledge and resources to reduce risks and prepare for disasters. Village-based disaster mitigation is not only about reducing risks, but also about building community empowerment and improving quality of life. By actively involving village communities in mitigation efforts, we can minimise the impact of disasters and support communities in dealing with threats that may come. This chapter discusses village-based disaster mitigation which consists of four parts. The first and second parts discuss the introduction of the Mount Bromo area as the Bromo Tengger Semeru National Park (TNBTS) with the concept of a nature reserve managed with a zoning system used for research, science, education, culture and entertainment purposes. Then the third part discusses the local wisdom possessed by communities around disaster mitigation areas. The next part discusses the case of disaster mitigation on Mount Bromo which consists of the sub-parts Mount Bromo and the Tengger Tribe, the Tengger Tribe and the Environment, and the Preferences of the Tengger Tribe When Evacuating. This chapter closes with a conclusion that discusses perch communities in disaster mitigation. This study looks at several parameters that influence disaster mitigation such as government support, shelter criteria, local wisdom, and accessibility.

**Keywords:** disaster mitigation, local wisdom, community involvement

## 7.1. Introduction

Local wisdom is a form of cultural wealth in Indonesia. There are various forms of local wisdom, not only regarding food and traditional clothing but also behaviour, regional values and others. Regarding disasters, several local wisdoms have a significant impact in terms of preparedness and safety. On the island of Java, there is a "*siskamling*" (environmental security system) culture with security posts still using "*kentongan*" (bamboo or wood which is struck to sound an alarm). The tone of the beat on *kentongan* has a different meaning from one tone to another. *Kentongan* as a marker of social status is distinguished based on several categories such as the type of wood, the size of the wood, the placement of *kentongan* and a number of other categories. The tsunami disaster in 2004 has proven that "*smong*" (also known in the local language "devayan" which means a big wave) is an important instrument in reducing the loss of life in the Simelue Islands, Aceh Province. *Smong* is a community action to immediately move to higher ground or hills if they see and experience signs of an imminent tsunami such as an earthquake, a receding coastline, and so on.

*Smong* has been transmitted through fairy tales and other oral traditions down through generations and by other spoken culture delivered by community leaders. The story of *smong* is sung in the form of a poem which contains natural phenomena that can cause a tsunami and an invitation to run to a high place immediately if there is a very

*Fadly Usman*, Aris Subagiyo, and Turniningtyas Ayu Rachmawati*
**email: fadlypwk@ub.ac.id*
https://doi.org/10.11594/futscipress33

strong ground shaking. Unlike the coastal communities, Tengger people have their own local wisdom in responding to the risk of loss owing to Mount Bromo's eruption. Apart from waiting for directions from traditional shamans, the behaviour of plants and animals is also used as a parameter in determining actions to evacuate or stay at home and closing doors and windows. The social hierarchy that is formed in the Tengger tribe does have its own uniqueness where the rules of deliberation and consensus are a very strong foundation in building emotional closeness between residents like the family.

## 7.2 Mount Bromo area

The 50,276-hectare Bromo Tengger Semeru National Park (TNBTS) is located in a hilly region and is home to three well-known picturesque areas: Mount Bromo, Tengger Caldera, and Mount Semeru. According to the Decree of the Director General of PHKA (Forest Protection and Nature Conservation), No. 68/Kpts/Dj-VI/1998, the TNBTS's zoning is divided into the following areas: Core Zone (22,006 Ha); Jungle Zone (23,485.20 Ha); Intensive Use Zone (425 Ha); Traditional Use Zone (2,360 Ha); and the (2,000 Ha) Rehabilitation Zone. As show in Figure 7.6, the concept of a National Park is a terrestrial and aquatic nature reserve with indigenous ecosystems and managed by a zoning system used for research, scientific, educational, cultural, and cultural purposes, travel and entertainment. The Bromo Tengger Semeru plateau has the uniqueness of being enclaved in a conservation area. TNBTS is one of many national parks that play a significant part in preserving the healthy operation of local ecosystems in the region surrounding East Java. Some of these areas are in TNBTS such as the village of Ranu Pani whose village name comes from Ranu (or lake in Tengger language) in Senduro district, Lumajang Regency (Reva et al., 2018).

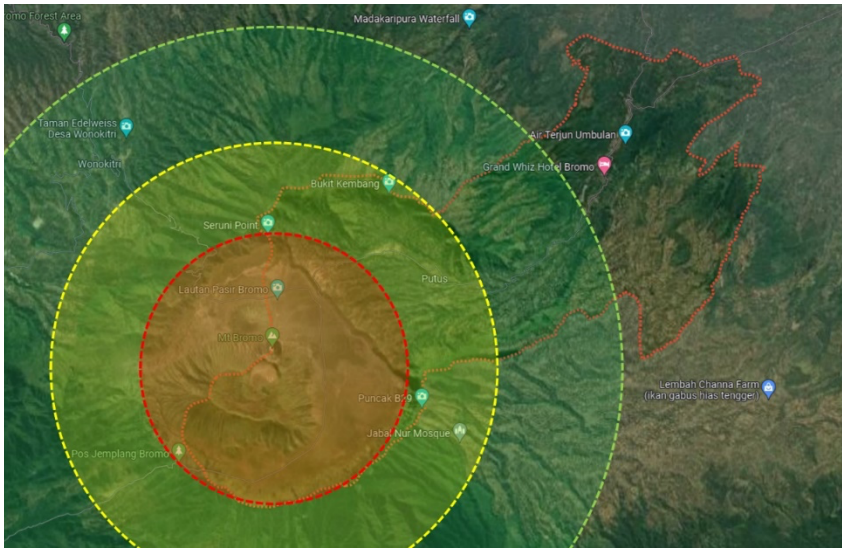



**Figure 7.6** Disaster Prone Areas I, II and III

In this chapter, there are two important parts which will be discussed separately but still hierarchically, Tengger tribe and its environment and the preferences of Tengger people in choosing an evacuation site from the Mount Bromo eruption. SEM (Structural Equation Modeling) is a statistical study that can examine a number of relationships that are typically difficult to measure at the same time. SEM is a multivariate analysis technique that combines factor analysis with regression (correlation) analysis to

investigate the relationship between variables in a model, both between indicators and their components and between constructs themselves. PLS (Partial Least Square) is a structural equation model based on components or variants. PLS is an alternate approach that moves from a covariance-based to a variance-based SEM approach.

SEM, which is based on covariance, is used to assess causality or theory, whereas PLS is more focused on prediction models. There is, however, a distinction between covariance-based SEM and component-based PLS. This is demonstrated by the use of structural equation models to test ideas or build theories with the goal of making predictions (Hair et al., 2021). SEM-PLS usage recommendations are provided:

a. When the analysis is related to putting the theoretical framework to the test in terms of prediction.
b. When the structural model is complex and has a large number of components, indicators, and/or model links.
c. When the purpose of research is to improve understanding of rising complexity by investigating theoretical expansions of existing theories.
d. When the path model comprises one or more constructs that are formatively measured.
e. When the investigation includes financial ratios or other related forms of data.

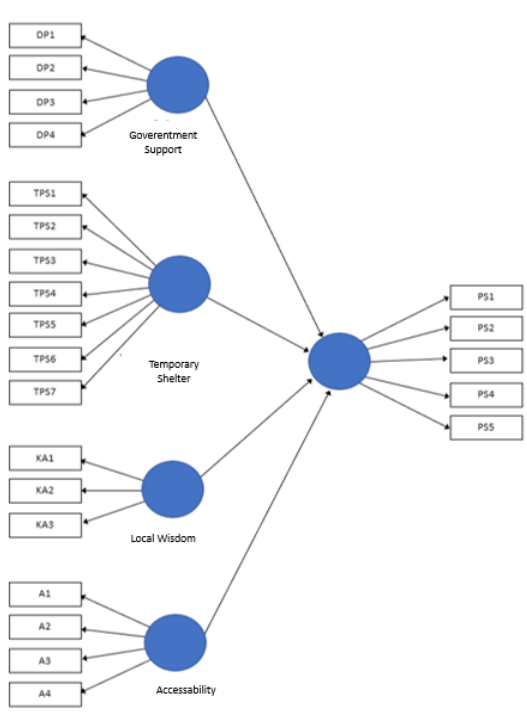
When the model has several constructs and numerous elements, PLS-SEM provides a solution with a small sample size. In actuality, the PLS-SEM algorithm accomplishes this by calculating the measurements and structural model associations independently, rather than simultaneously. Regardless of whether the data comes from the general or composite model population, PLS-SEM provides a solution when traditional statistical methods with SPSS develop results that are unacceptable or inconsistent with complex models and sample sizes. PLS-SEM can be utilised with smaller samples; however, the structure of the data population limits which cases allow for small sample sizes. Assuming that the features of other scenarios are the same, the more heterogeneous the population, the more samples are required, and this will affect the sampling errors obtained. Because PLS-SEM has stronger statistical analysis power, it is more likely to discover significant correlations in the research population (Ringle et al., 2010). PLS-SEM features offer stronger statistical power for exploratory research that explores immature or still emerging theories and is statistically proved (Figure 7.7).

A reflecting measuring model is evaluated by looking at loading indications; for instance, a number above 0.708 indicates that the model is advised. This demonstrates that the construct accounts for more than 50% of the variance of the indicator, and as a study outcome, it offers a reliable item.

The following step is to evaluate the internal consistency's reliability. A higher value often denotes a greater dependability level; for instance, in exploration, a reliability rating between 0.60 and 0.70 is regarded appropriate. Scores between 0.70 and 0.90 were considered "satisfactory to good" in the study. A value of 0.95 or above is considered troublesome since it shows that the item is redundant, lowering construct validity. A dependability value of 0.95 or above also suggests the probability of an undesirable response pattern. Hair et al. (2019) claim that the percent confidence interval construct dependability is more than 0.70. Similarly, they can see if construct reliability is much lower than the highest recommended limit (for example, if the upper limit of the 95% confidence interval for construct, reliability is less than 0.95). Researchers must generally employ the percentile approach to produce bootstrap confidence intervals.

According to Hair et al. (2019), the third step of assessing the reflective measurement model discusses the convergence of the validity of each construct measure. Convergent

validity is measuring the extent to which a convergent construct explains item variance. The metric used to evaluate construct convergent validity is the average of variance extracted (AVE) for all items in each construct. The convergence of the validity of each construct measure is covered in the third step of evaluating the reflective measurement model (Hair et al., 2019). The degree to which an item variation is explained by a convergent construct is measured by convergent validity. The AVE for all items in each construct is the statistic used to assess construct convergent validity. AVE must be calculated by squaring the loading of each indicator in a construct and determining its average value (Hair et al., 2019). The construct must account for at least 50% of the item variation to have an acceptable mean AVE of 0.50 or higher.




| No | Preference of Shelter |
|---|---|
| 1 | **Goverenment Support** |
| | A. Disaster-prone areas (KRB) |
| | B. Temporary shelter |
| | C. Temporary transportation |
| | D. logistics available |
| 2 | **Temporary Shelter** |
| | A. Wide capacity |
| | B. Ease of access and reach |
| | C. Comfortable place |
| | D. Toilets available |
| | E. Public kitchen |
| | F. Supporting infrastructure |
| | G. Place of loading logistics |
| 3 | **Local Wisdom** |
| | A. Directions from traditional shamans |
| | B. Customary deliberations |
| | C. Preparedness or "nagab" |
| 4 | **Accessability** |
| | A. Close to settlements |
| | B. Main road for vehicles |
| | C. Width of the road |
| | D. Good road quality |

**Figure 7.7** Schematic and parameters in the analysis with PLS-SEM method

The Tengger tribe's natives will experience brief discomfort in times of emergency because of Mount Bromo's eruption. Figure 7.7 is the schematic and parameters used with the PLS-SEM method in this study. There are three villages directly adjacent to the crater of Mount Bromo and all respondents were taken from these three villages including Ngadisari Village, Wonotoro Village and Ngadas Village.

## 7.3 Local Wisdom

Many parties agree that local traditions and wisdom are rich in humanistic values that have the potential to build effective communication as local knowledge systems can even differentiate one local community from another. There are several local wisdoms according to Naritoom (2009) which can be distinguished based on:

a. Food is primarily influenced by geography, climate, and staple crops. For instance, Sasi Laut is a piece of traditional knowledge used in Maluku and other regions to guarantee the continuance of the food supply.

b. Health: this pertains particularly to medicine, such as the prevention and treatment of diseases. For instance, each region has indigenous medicinal herbs that are special due to their distinct characteristics.
c. Production methods: According to local custom, these facilities are used to employ labour and support livelihood requirements. For instance, Masohi in Maluku, and Subak in Bali both serve to create new agricultural land.
d. Housing: This is dependent on the local temperature and the availability of building supplies. For example, Eskimo igloos, houses made of *"gaba-gaba"* (sago tree fronds) in Ambon or stilt houses in the Bukit Barisan area in the Malay tribe, Sumatra.
e. Clothing: this is suitable for different climates and depends on the availability of materials.
f. Relations between residents: this can be learned from ongoing relationships with fellow human beings to meet the needs in life. As an example, Pela's relationships in Maluku focused on meeting demands for food, housing, production systems, and other necessities, as well as other local knowledge like smong, which has been well-known in Simeulue ever since the 1970 tsunami that devastated the islands.

Local wisdom traditionally rooted in a community is expressed and cultivated as a form of defence against obstacles and environmental change. Related to this local wisdom, a basic information system that supports communication and decision-making in the community has been discovered. The system is very dynamic and influenced mainly by the creative spirit of the inner community while external knowledge is taught and absorbed by one generation and passed on to the next generation.

## 7.4 Mount Bromo and Tengger Tribe

Mount Bromo (Bromo) for the Tengger people has a sacred and holy meaning and not only has a spiritual dimension (a center of worship) but also has a social dimension at the same time. Bromo, derived from the word "Brahma", refers to the name of a god in the teachings of Hinduism. Brahma also means throne, foundation, or chakra (center of life or center of power). It is not surprising that the Tengger Hindu community respects Mount Bromo very much. In the spiritual dimension, Bromo for the Tengger people is *punjêré kauripan* (center of life) and is considered a sacred mountain, although they refuse to be called Mount Bromo worshippers. For them, the god is Sang Hyang Widhi Wasa. Mount Bromo is the center of power and throne.

On the social dimension, Bromo is an arena for socialising among fellow Tengger residents (known as *nglumpuke wong Tengger*) during the Yadnya Kasada ceremony (described in the article "Yadnya Kasada"). It is also an arena for socialising or communicating with nature because the majority of people live by farming and the fertility of their agricultural land depends on the eruption of volcanic ash from Mount Bromo (the people of Tengger know and understand this), therefore, they consider Mount Bromo to bring blessings to their life.

The Tengger people's traditions and practises are inextricably linked to the notion of Bromo (Mount Bromo) (Figure 7.8). The Tengger people's spiritual bond with Mount Bromo (Brahma) seems to have become the spiritual identity of the Tengger people. There are teachings about life in it such as the relationship with transcendental supernatural powers, with fellow creatures and with nature. The Tengger plateau has been renowned as a quiet, peaceful location since the Majapahit era, and its people are even exempt from paying taxes, known as titileman. The Tenggerese were admired by General Thomas Stamford Raffles. He wrote in The History of Java that during his journey

to that chilly place, he witnessed the Tenggerese living in a calm, orderly, honest, industrious labour, and always joyful atmosphere. They have no knowledge of gambling, opium, adulterous affairs, stealing, or other forms of crime. Villages included in the Tengger community are those in the district area where the bulk of the population is Hindu and still follows Tengger customs.



**Figure 7.8** The condition of Mount Bromo when the eruption occurred

Among the duties of the head shaman are resolving conflicts that exist between shamans and facilitating solving Tengger people's problems in their respective regions. Apart from using the media to gather during the Yadnya Kasada ceremony, a head shaman usually pays visits to the four Tengger communities (Probolinggo, Pasuruan, Lumajang and Malang). So traditionally, a shaman head usually comes from a circle of people who have quite good finances. In the social structure of the Tengger community, the position of the shaman, especially the head of the shaman, occupies the top position. For this reason, the position of head of the shaman is a very strategic position in the social structure of the Tenggerese community. Besides having very strong spiritual and social legitimacy, shamans also have political power in the Tengger community. Uniquely, a head shaman does not act as the head shaman but as a village shaman (representing the village where he comes from). In reading a prayer (mantra), a head shaman does not recite a prayer on behalf of all Tengger people but on behalf of their respective villages. This means that although the dukun head has social (as well as political) authority, in terms of reciting prayers (during the Yadnya Kasada ceremony), it is as if he does not have religious authority (praying matters become the territory of the village shaman or on behalf of each village). Tengger people's adherence to customs has contributed to social relations that are quite conducive and strong in maintaining their cultural identity as indigenous peoples. The source of the Tengger people's life activities is how they maintain, inherit and live the traditional values that have existed and been institutionalised for many years.

## 7.5 Tengger Tribe and the Environment

Tenggerese are one of the ethnic groups that color the diversity of people who live in Indonesia, especially in Java. Tengger tribe is an indigenous people who come from the highlands around the Tengger, Bromo and Semeru mountains, which are located in East Java. Tengger tribe is also known by various names such as Wong Brama, Bromo People, or *Wong Tengger*. Tengger people do not only live on the slopes of the mountains but are also scattered in several surrounding areas such as Lumajang, Probolinggo, Pasuruan and Malang Regencies. The origin of the Tengger tribe is etymologically derived from the term “tengger” in Javanese which means upright or still without moving. When associated with

public trust, tengger can also come from the abbreviation "tengering virtue". Reporting from Kompas.com news, there are several theories about the origin of the Tengger Tribe. However, the local people believe that the people's ancestors, the Tengger people, came from Majapahit. This is related to the period of the Hindu kingdom on Java Island where the Tengger mountains were recognised as a holy place inhabited by the spiritual servant of Sang Hyang Widi Wasa who was also known as "*Hulun*". This theory is proven by the Walandhit Inscription numbered 851 Saka or 929 AD which tells of the existence of a village called Walandhit in the Tengger Mountains and is a holy place inhabited by *Hyang Hulun* or servants of God. The next inscription was found in the Penanjakan area (Wonokitri Village), Tosari District, Pasuruan Regency, which dates to 1327 Saka or 1405 AD. The emergence of the Islamic Mataram Kingdom which expanded its power to East Java in the early 17th century did not affect the people's beliefs in the Tengger area which still maintained its identity. The following are various forms of tradition that are still carried out by the Tengger Tribe (Figure 7.9):

1. **Kasada Ceremony or Yadnya Kasada.** The Kasada ceremony is a holiday for the Tengger people who adhere to Hindu Dharma teachings. Yadnya Kasada is performed on the 14th day of the Kasada month in the form of offerings to Sang Hyang Widhi as a manifestation of Batara Brahma. The performance of the Kasada ritual takes place through several stages such as Puja Purkawa, Manggala, Nglat Umat, Tri Sandiya, Muspa, distribution of Bija, Diksa Widhi and offering of offerings at Bromo crater. The ritual process begins at Sadya Kala Puja and ends at Surya Puja. Tengger residents flock to Mount Bromo to offer livestock and farm produce to the Luhur Poten Agung Temple. During the implementation, Rama Dukun Pandita will recite the Japa Mantra, which contains prayers for the safety of the entire universe.
2. **Raya Karo or Yadnya Karo.** Hari Raya Karo or Yadnya Karo is the second celebration after Yadnya Kasada which is held on the 2nd day according to the Tenggerese calendar. The Yadnya Karo celebration was attended by three villages including Jetak, Wonotoro and Ngadisari villages. The meaning of the Yadnya Karo celebration is to symbolise the origin of human birth created by Sang Hyang Widiwasa through the marriage of two types of humans, male and female.
3. **Unan-Unan Tradition.** Residents of the Tengger tribe on the slopes of Mount Bromo are also familiar with *Unan–Unan* rituals or traditions. The term *Unan-Unan* comes from the word "*tuno*" which means shortened and is related to the number of days in the Tengger calendar. Normally, each month has 30 days, some months have only 29 days. If you add them up, there's a difference between five and six days a year. To compensate for this omission, the date difference is introduced into the month of Dhesta or the 11th month which appears in the calendar only once every five years. So, in the month of Dhesta, once every five years, members of the Tengger tribe hold the *Unan-Unan* ritual to clean up the village to be safe from disaster.



**Figure 7.9** Traditional ceremonies, Mount Bromo and Luhur Poten Temple in the Mount Bromo Crater Area

The Tengger people have their own unique efforts in performing environmental preservation. Some efforts are in the agricultural sector with the system of terraces and keeping the environment of the village clean from tourist waste. This can be seen in the presence of trash cans in the corners. In addition, the people of the Tengger tribe, faced with the plight of Ranu Pani, try to clear the weeds by hand every day. The manual cleaning process uses traditional tools such as bamboo harrows, iron rakes, used sacks, ropes, and long bamboo. The weed-covered part of the lake is divided into zones first and then the sections are bordered by long bamboo to become squares. After that, weeds are herded manually using bamboo to the edge of the lake. When the weeds were on the shores of the lake, the residents took the weeds together using bamboo rakes and piled them on the edge of the lake. Other residents, also using used sacks, netted the weeds and threw them to the shore. Weeds that are piled up on the banks will be allowed to dry and then used as organic fertilizer by residents. The Ranu Pane environment is included in the Bromo Tengger Semeru National Park area. This is also one of the important factors for conservation efforts by the community. Apart from being located in a national park area, the Ranu Pane environment is also a tourist attraction that has great potential for damage. Therefore, the community is making efforts to conserve this environment (Reva et al, 2018).

## 7.6 Preferences of Tengger Tribe When Evacuating

In the culture of the Tengger Tribe, the position of the Traditional Shaman is not only as a community figure or regional leader, but also everything he says becomes a law that passes for the whole community. In the study of preferences for places of refuge for the Tengger tribe, there are several variables used such as government support (delineation of disaster-prone areas, provision of temporary shelters, transportation to refugee camps, and availability of logistics), temporary shelters (wide capacity, ease of access, comfortable places, available toilets, public kitchens, supporting infrastructure, and logistic loading places), local wisdom (directions from traditional shamans, customary meetings, preparedness or "*ngajab*"), accessibility (close to settlements, main roads for motorised vehicles, adequate road width, and good quality roads).

In this study, there are five evacuation places offered to the community including places of worship, village halls, markets, evacuation sites, and Whizz hotels located in disaster-prone areas (KRB III). Partial Least Square (PLS) is becoming an effective method for research because it minimises reliance on the scale of measurement (e.g., measurements needing interval or ratio scales), sample size, and residual distribution (Chin, 1998). In Partial Least Square (PLS), indicators might be of the reflexive or formative sorts. The following equation from the structural model illustrates the relationship between the independent (exogenous) latent variables and the dependent (endogenous) latent variables (Wold, 2013).

$$\eta = B\eta + \Gamma\xi + \zeta \qquad (1)$$

η *(eta)* is a random vector of endogenous latent variables with size mx1. ξ *(xi)* is a random vector of exogenous latent variables with size nx1, and B is the coefficient matrix of the endogenous latent variable of size mxm and Γ matrix of exogenous latent variable coefficients, which shows the relationship of ξ to η of size mxn. While, ζ (zeta) is a random error vector of size mx1. The assumptions of the latent variable structural model equation

include: E(η) = 0, E(ξ) = 0, E(ζ) = 0, and ζ is not correlated with ξ and (I - B) is non singular matrix. In PLS, model evaluation is divided into two stages: measurement model evaluation and structural model evaluation. The measuring model was evaluated using several criteria and stages of analysis as follows (Hair et al., 2013; Vinzi et al., 2010):

1. The dependability of the indicator. This demonstrates how many indicator variants may be explained by latent variables when the loading value is considered. The indicator must be removed from the model if the loading value is less than 0.4.
2. Construct reliability or internal consistency. A composite dependability (ρ) number greater than 0.6 can be used to compute this.
3. Validity that is convergent. In general, it is analysed using the extracted average variance (AVE), with a minimal AVE value of 0.5 indicating a good measure of convergent validity.
4. Discrimination validity. This is established by comparing the AVE root value, which must be larger than or equal to the correlation between constructs squared, to the correlation between constructs squared.

Meanwhile, the following criteria can be used to evaluate the structural model:

1. Enumerate the percentage of variance explained by endogenous latent variables.
2. Path coefficient - this metric describes the strength of the association between two constructs.
3. Effective value of f2 - indicates if endogenous latent factors have a significant influence on exogenous latent variables. R2-include is R2 calculated with exogenous latent variables, whereas R2-exclude is calculated without exogenous latent variables. The values are 0.02 (weak exogenous latent variable), 0.15 (moderate exogenous latent variable), and 0.35 (strong exogenous latent variable), respectively.
4. Stone Geisser Q2 grades 0 shows the model's ability to predict when it is at or above 0.
5. The Goodness of Fit (GoF) Index - which is used to assess the entire compositional and measurement model. The values for communities are calculated by squaring the loading values using the criterion 0.1 (GoF small), 0.25 (GoF moderate), and 0.36 (GoF large).

The bootstrap method was developed by Efron as a tool to help reduce the unreliability associated with errors using the normal distribution and its use (Efron & Tibshirani, 1998). In bootstrap, faux data (shadow data) are created utilising the details and attributes of the original data, giving the shadow data properties comparable to those of the actual data (Fauzian et al., 2018). In the bootstrap method, sampling is also carried out by returning the sample data (resampling with replacement). Data were collected in three villages next to Mount Bromo's crater, including Ngadisari Village, Wonotoro Village, and Ngadas Village, to explore the Tengger people's preferences in choosing a place of refuge when the eruption occurred. Respondents consisted of adults aged between 20 – 55 years. Each village selected 65 people as respondents. Figure 7.10 is the value of the loading factor after eliminating indicators. Some composite values show a value that is smaller than 0.6 and this shows that the variable has no effect. This demonstrates that the Tengger tribe dislikes this variable while selecting a site of refuge. The variable values that are less than 0.6 include the availability of transportation from the government (0.523), infrastructure facilities at evacuation sites (0.545), logistics loading places in evacuation areas (0.345), preparedness "ngajab" (0.324), road width (0.342), and road quality (0.342). Meanwhile, the evacuation sites chosen by the Tengger

people are the village hall (0.683), the evacuation site (0.895), and the Whizz hotel (0.820). Meanwhile, two other places were not the main choices, places of worship (0.545) and markets (0.533).

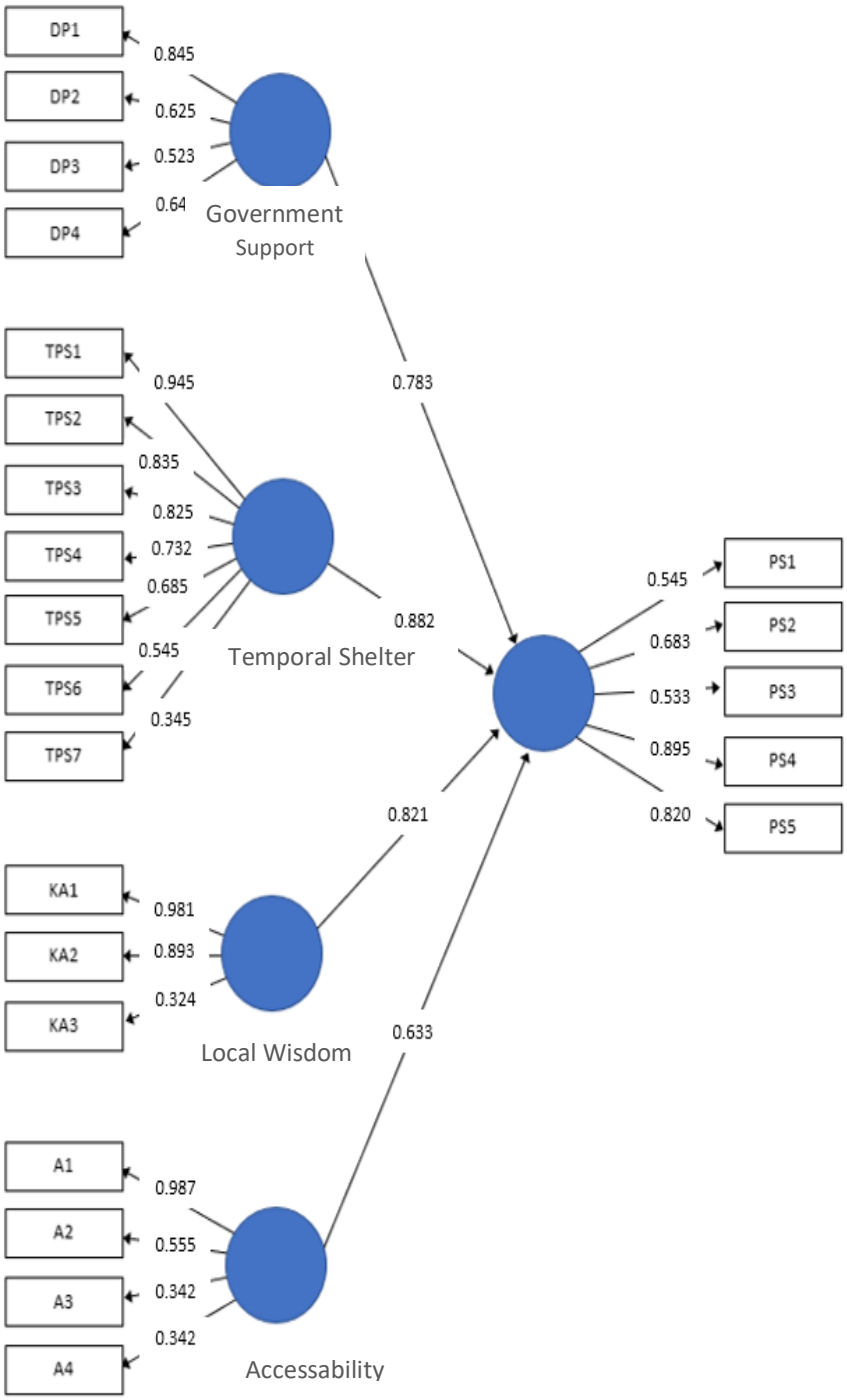



**Figure 7.10** Loading Factor Value After Indicator Elimination

The five latent variables have a composite reliability value over 0.6, according to the composite reliability values shown in Table 1. It can be argued that the five measurement models are reliable if the indicators used can accurately measure each latent variable (construct).

**Table 7.1** Composite Reliability and AVE Measurement Model Values

| | **Composite reliability** | **AVE** |
|---|---|---|
| Government Support | 0.855 | 0.662 |
| Shelter Criteria | 0.692 | 0.756 |
| Local Wisdom | 0.893 | 0.835 |
| Accessibility | 0.557 | 0.634 |
| Temporal Shelter | 0.875 | 0.753 |

Higher correlation amongst the markers that comprise a construct demonstrates better convergent validity. Table 7.1's AVE values demonstrate that the five latent variables have AVE values above the minimal requirement, or 0.5, indicating that the convergent validity measure is satisfactory or that the convergent validity conditions have been met. Comparing the correlation between constructs and AVE roots, as shown in Table 7.2, is the next criterion to determine discriminant validity.

**Table 7.2** Correlation between variables

| | **Government Support** | **Shelter Criteria** | **Local Wisdom** | **Accessibility** | **Temporal Shelter** |
|---|---|---|---|---|---|
| Government Support | 1 | 0.892 | 0.705 | 0.667 | 0.574 |
| Shelter Criteria | 0.892 | 1 | 0.652 | 0.637 | 0.726 |
| Local Wisdom | 0.705 | 0.652 | 1 | 0.334 | 0.878 |
| Accessibility | 0.667 | 0.637 | 0.334 | 1 | 0.839 |
| Temporal Shelter | 0.574 | 0.726 | 0.878 | 0.839 | 1 |

The association between latent variables as determined by the path coefficients R2, f2, Q2, and GoF is modelled by the structural model (internal model). Results of path coefficients and t-statistics obtained during warm-up with full sample for 195 and 700 repetitions resampling are shown in Table 7.3 as follows:

**Table 7.3** Structural Model Path Coefficient Values

| | ***Standard Error*** | ***T- Statistic*** | ***P-value*** |
|---|---|---|---|
| Government Support → Temporal Shelter | 0.185 | 1.662 | 0.069* |
| Shelter Criteria → Temporal Shelter | 0.169 | 3.056 | 0.076* |
| Local Wisdom → Temporal Shelter | 0.189 | 2.839 | 0.088* |
| Accessibility → Temporal Shelter | 0.157 | 1.657 | 0.005* |

The model's viability is then tested using the R2 value. For choosing an evacuation site, the R2 value is 0.835. This demonstrates that 83.5% of the variability of the endogenous variables can be accounted for by the variability of the exogenous variables. In addition to the R-Square test, a test was also performed regarding the effect of

endogenous variables on known exogenous variables, based on the value of effect size f2 presented in the table below. The obtained GoF value is 0.710 (large), which means that the model has a very good ability to explain the experimental data. Therefore, we can say that the pattern formed is valid. The obtained Q2 value is 0.835 (greater than 0) so that the obtained structural model has a suitable prediction. Thus, the resulting equation is as follows:

Preference of Tengger tribe = 0.583 Government support + 0.321 shelter criteria + 0.792 local wisdom + 0.203 accessibility + ζ

# 7.7 Conclusion

It can be said that the preference of the Tengger people in choosing an evacuation site when an eruption occurs is a parameter that is very significantly influenced by government support, shelter criteria, local wisdom, and accessibility. In this study, local wisdom is known to have the greatest impact on the Tenggers in all preparatory measures, especially in terms of evacuation to temporary shelters.

# References


Chin, W. (1998). The Partial Least Squares Approach to Structural Equation Model. *In G. A. Marcoulides, Modern Methods for Business Research (Pp. 295-336). London: Lawrence Erlbaum Associates*.

Efron, B., & Tibshirani, R. J. (1998). An Introduction to the Bootstrap (2nd ed). *New York: Chapman & Hall*.

Fauzian, P. A. P., Goejantoro, R., & Hayati, M. N. (2018). Determining the Number of Bootstrap Replications Using the Pretest Method on Independent Sample T Test. *Exponential Journal, Volume 9, Number 1, Pp. 35-40*.

Hair, J. F., Hult, G. T. M., Ringle, C. M., Sarstedt, M., Danks, N. P., & Ray, S. (2021). *An Introduction to Structural Equation Modeling*. 1–29. https://doi.org/10.1007/978-3-030-80519-7_1

Hair, J. F., Ringle, C. M., & Sarstedt, M. (2013). Editorial Partial Least Square Structural Equation Modeling: Rigorous Applications, Better Results and Higher Acceptance. *ELSEVIER, 1-12*.

Hair, J. F., Risher, J. J., Sarstedt, M., & Ringle, C. M. (2019). When to use and how to report the results of PLS-SEM. In *European Business Review* (Vol. 31, Issue 1, pp. 2–24). Emerald Group Publishing Ltd. https://doi.org/10.1108/EBR-11-2018-0203

Naritoom, C. (2009). Local wisdom / indigenous knowledge system, Nakhon Pathom. *Thailand: Kasetsart University*.

Reva, F. A., Dian, P., Fitra, A. S., & Najatul Ubadati, S. (2018). Local Wisdom of the Tenggerese Trihitakarana in Continuing Ranu Pani Conservation. *JTP2IPS Volume 3 Number 2, Pp. 76 – 80., Http://Dx.Doi.Org/10.17977/Um022v3i22018p076*.

Ringle, C. M., Sarstedt, M., & Mooi, E. A. (2010). Response-based segmentation using finite mixture partial least squares: theoretical foundations and an application to American customer satisfaction index data. *Annals of Information Systems, Vol. 8, Pp. 19-49*.

Vinzi, V. E., Chin, W. W., Henseler, J., & Wang, H. (2010). Handbook of Partial Least Squares. *Berlin: Springer*.
Wold, H. (2013). Partial Least Square. *In G. A. Marcoulides, Modern Methods for Business Research (p. 295). New York: Psychology Press*.

# CHAPTER 8: INCREASING VILLAGE CAPACITY IN FACING NATURAL DISASTERS

***Authors: Turniningtyas Ayu Rachmawati, Fadly Usman, and Dian Dinanti***

## Abstract

Village capacity is the ability and readiness of a village community to face, respond to, and recover from natural disasters or crisis situations. Village capacity covers various aspects, such as knowledge and understanding of disaster risks, skills in emergency response actions, planning, disaster-resistant infrastructure, and cooperation between community members. In the context of village capacity building, the aim is to ensure that village communities have adequate knowledge, skills, resources and plans to deal with natural disasters, so that they can reduce risks, protect lives, property and the environment, and recover quickly after disaster occurs. Increasing village capacity in dealing with natural disasters is an important process to protect the community and village assets from the impacts that may occur due to natural disasters. Increasing village capacity in dealing with natural disasters requires long-term commitment, cooperation and resource support from various parties, including the government, non-profit institutions and the community itself. With thorough preparation, villages can become more prepared and resilient in facing natural disasters. This chapter will discuss four parts of the chapter which include an introduction, creating disaster resilient villages, disaster education as a tool for increasing community capacity, case studies of local knowledge and disaster management.

**Keywords:** village capacity, disaster management, disaster resilient village

## 8.1 Introduction

The occurrence of natural catastrophes in Indonesia is closely intertwined with the country's geological, topographical, hydrological, and demographic characteristics. Indonesia, situated along the Pacific Ring of Fire, is subject to a multitude of natural hazards, encompassing earthquakes, tsunamis, volcanic eruptions, flooding, and droughts. The country experiences an annual occurrence of over 3,000 natural disasters, with hydro-meteorological events, such as storms, tornadoes, and floods, accounting for over 90% of these incidents. Notably, the aftermath of earthquakes and tsunamis tends to be more severe and devastating in terms of loss of life and destruction. Various forms of disasters can occur. The escalating frequency of disaster events, particularly those of a natural origin, has underscored the imperative for effective disaster management. This entails the strategic coordination of efforts aimed at mitigating the adverse consequences of such events, necessitating a systematic approach to address the responsibilities associated with disaster prevention, preparedness, response, and recovery. Villagers, generally an indigenous community living in a village for generations, naturally recognise their environmental characteristics, as such they should be the spearhead for the government in DRR. A trend toward individualistic community due to urbanisation disables awareness on changes in the surrounding environment, resulting in fatal consequences from unpreparedness when a disaster occurs. The involvement of villagers in DRR is profound in dealing with any possible disasters, which demand community

*Turniningtyas Ayu Rachmawati*, Fadly Usman, and Dian Dinanti*
**email: t_tyas@ub.ac.id*
https://doi.org/10.11594/futscipress35

resilience and adaptation capability to deal with the hazard and recover immediately from the disaster impact.

Disaster Risk Analysis is the first step in a Disaster Risk Assessment. Disaster risks that must be distinguished from disaster hazards yet are often considered the same by stakeholders. Hazard causes disruption or damage to community, property, infrastructure, and the environment and is defined as natural conditions or human activities that cause damage and cost lives. Disaster risk analysis assesses hazards, vulnerability, and capacity variables. DRR, defined as a systematic approach to identifying, assessing, and minimising a disaster risk, focuses on diminishing socio-economic vulnerabilities to disasters and dealing with the environmental and other hazard causes.

The development and relief agencies as the responsible parties should be an integrated part of the organisation instead of an add-on or one-off action. In DRR, building capacity upgrade is essential and easier when compared to reducing vulnerability which takes a long process as the community develops. Capacity is the ability of regions and communities to take action to reduce hazards and damage from disasters. Especially in village communities, capacity poses crucial importance due to low capacity in dealing with disasters as a result of limited human resources with disaster knowledge, limited information, financial limitations, small population, limited access to health facilities, and so forth. DRR aims to minimise possible negative impacts, generally conducted when a disaster does not occur.

## 8.2 Creating Catastrophe-Resilient Villages

### 8.2.1 Understanding the Need for Disaster-Resilient Communities

Community Based Disaster Risk Management approach encourages communities to manage disaster risk at the local level. Indonesia's National Board for Disaster Management (BNPB) oversees all disaster-related activities. BNPB stands atop the national (Center For Excellence in Disaster Management & Humanitarian Assistance, 2021). Without the active participation of the populace, the government cannot manage all types of disasters using institutional machinery. Consequently, it seeks community participation, which is the most important and effective factor in achieving sustainability while addressing development and disaster risks.

Due to the importance of building resilient communities capable of adapting and thriving with disaster risks, the central government through BNPB has developed a system and strategy through a community-based DRR policy, The Villager Disaster Resilient Program (Disaster Resilient Village-DESTANA) as stated in BNPB Head Regulation Number 1 of 2012 concerning DESTANA (Peraturan Kepala Badan Nasional Penanggulangan Bencana Nomor 1 Tahun 2012 tentang Pedoman Umum Desa/Kelurahan Tangguh Bencana, 2012). DESTANA represent a village with the independent ability to adapt and face the disaster hazards, and to immediately recover from the disaster detrimental impacts (Peraturan Kepala Badan Nasional Penanggulangan Bencana Nomor 1 Tahun 2012 tentang Pedoman Umum Desa/Kelurahan Tangguh Bencana, 2012). Destana is a manifestation of the government's responsibility to provide community protection from the disaster hazard.

### 8.2.2 Strategies for Increasing Village Communities' Disaster Management Capacity

Community-based DRR refers to a range of initiatives aimed at mitigating the risks and vulnerabilities associated with disasters, while simultaneously enhancing the community's capacity to respond effectively. These efforts are strategically devised and executed by the community itself, which assumes the central role in driving the DRR process. The purpose behind the establishment of DESTANA, as outlined in Perka BNPB 1/2012, is to serve a specific objective. The objectives outlined are as follows: 1) Enhancing the safeguarding of communities residing in areas prone to hazards against the detrimental consequences of disasters; 2) Facilitating greater involvement of communities, particularly those belonging to vulnerable groups, in the management of resources for disaster risk reduction (DRR); 3) Strengthening the institutional capacity of communities to manage resources and preserve local knowledge pertaining to DRR; 4) Enhancing the government's ability to provide resources and technical assistance for DRR; and 5) Promoting increased collaboration among stakeholders in the field of DRR.

DESTANA initiative promotes community engagement in the comprehensive examination, analysis, management, surveillance, assessment, and mitigation of catastrophe risks within rural areas, through the utilisation of locally available resources. The components comprising DESTANA encompass six key elements: (1) Legislation, (2) Planning, (3) Institutions, (4) Funding, (5) Capacity building, and (6) Organising Disaster Management. The expectation is that rural communities, due to their ability to identify future disasters, can mitigate the adverse effects of such events and mobilise all sectors of society to actively engage in disaster response and recovery efforts.

### 8.2.3 Integrating Disaster Management Planning with Village Development Plans

Communities residing in disaster-resilient villages actively engage in the examination, analysis, management, surveillance, assessment, and mitigation of catastrophe risks within their locality through the utilisation of locally available resources. The planning process of Village Disaster Risk Reduction (DRR) is inherently intertwined with the annual development planning process, as it is conducted on a regular basis and yields a Village Development Work Plan Document, often known as the Village RKP Document. Disaster Risk Reduction (DRR) in rural communities encompasses a comprehensive program that addresses several aspects of disaster risk reduction. This program encompasses preventive, readiness, and emergency response, rehabilitation, and reconstruction efforts, targeting all priority disaster threats within a village setting.

In order to facilitate the implementation of disaster management, the village government has included Disaster Risk Reduction (DRR) as a prioritised program in the Village Medium Term Development Plan (RPJM Desa). This serves as a means of formalising its legalisation. Ensuring Disaster Risk Reduction (DRR) as a priority program within the Village RPJM is crucial in order to facilitate its integration with development planning at higher levels, such as sub-district, municipality, provincial, and national levels. This pertains to the financial allocation derived from the village DRR program. An illustrative instance is the formation program designated DESTANA, which is funded through village finances and frequently supported by the community.

## 8.3 Disaster Education as a Tool for Building Community Capacity

### 8.3.1 The Significance of Knowledge in Disaster Risk Reduction

Diverse perspectives exist among individuals and societies when it comes to their responses to a calamity. The answer is contingent upon the societal interpretation of several factors that influence individuals' adoption of attitudes or behaviours. The key elements encompassed in the process of community action during a crisis are knowledge, trust, economic considerations, and the presence of a supportive infrastructure. The extent of one's knowledge can serve as a guiding factor in formulating a response to a crisis. This knowledge is acquired by experiential engagement with disasters or through the assimilation of learning derived from official and non-formal educational institutions.

The community possesses knowledge not just regarding potential hazards but also possesses the necessary understanding of appropriate actions to undertake in the event of a crisis. There is a prevailing belief that it enhances the capacity to withstand and recover from subsequent calamities. In contemporary times, individuals throughout different regions of the globe possess awareness of calamities, although their understanding of appropriate actions during such events remains incomplete (Shiwaku & Shaw, 2008). Consequently, the acquisition of information plays a critical role in endeavours aimed at disaster risk reduction or DRR. Knowledge is crucial for swift and accurate decision-making, particularly in times of emergency and uncertainty, such as during a natural disaster. The process of decision making in the context of a disaster is subject to various influences, including the individual's level of knowledge, socio-cultural considerations, and the degree of trust placed in the community's established standards. The decision-making process during a disaster is significantly influenced by the knowledge acquired by each individual involved (Aksa, 2021). Insufficient understanding can result in critical errors that exacerbate the circumstances. Local wisdom or indigenous knowledge is cultivated through the transmission of knowledge via oral tradition or informal educational practices (Rozi & Taufik, 2020).

### 8.3.2 Differentiating Explicit and Tacit Knowledge

Efforts to respond to disasters that are undertaken due to public trust may be because the knowledge that constitutes it is difficult to comprehend and structure, making it difficult to provide awareness in its execution. Two categories of knowledge include: (1) explicit knowledge, and (2) tacit knowledge (Dalkir, 2013) (Table 8.4).

1. Explicit knowledge refers to a sort of knowledge that can be readily processed by a computer, transmitted to individuals using formal and electronic languages, or maintained within a database. Tacit knowledge of a personal kind is ingrained inside an individual's experiential framework, encompassing intangible elements such as personal convictions, discernments, viewpoints, and ethical frameworks (Murumba, 2020). The utilisation of explicit knowledge extends to diverse domains, encompassing its application in disaster response endeavours. The majority of strategies or approaches for addressing disasters through explicit knowledge are quantifiable and technical in character. These can be documented and organised by the scientific community, enabling the logic and rationale of this knowledge to be easily accessible for learning purposes.
2. Implicit knowledge, acknowledged as tacit knowledge, refers to knowledge that is inherent within a specific experience, practice, or talent. This particular form of

information is acquired in a straightforward and innate manner, devoid of any intentional or conscious effort, hence rendering it challenging to articulate to other individuals. Frequently, individuals are unaware of their possession of this knowledge (Chugh, 2015). Tacit knowledge refers to an individual's experiential and intuitive capacity to effectively address challenges, foster innovation, and arrive at appropriate judgments. The encoding, formalisation, and articulation of tacit knowledge in formal languages is a challenging task, as highlighted by several researchers (Ajith Kumar & Chakrabarti, 2012; Boiral, 2002; Fazey, Proust, Newell, Johnson, & Fazey, 2006; Raymond et al., 2010). For tacit knowledge to be effectively conveyed, it needs to be converted into verbal expressions, conceptual models, or numerical representations that facilitate comprehension. The acquisition of knowledge is predominantly limited to explicit information. The most of knowledge is contained within individual entities (North & Kumta, 2014).

**Table 8.4** Comparison of Properties of Tacit vs Explicit Knowledge

| **Tacit Knowledge** | **Explicit Knowledge** |
|---|---|
| Ability to adapt, to deal with new and exceptional situations | Ability to disseminate, to reproduce, to access, and to reapply throughout the organisation |
| Ability to apply expertise, know-how, know-why, and care-why | Ability to teach, to train |
| Ability to collaborate, to share a vision, to transmit a culture | Ability to organise, to systematise; to translate a vision into a mission statement, into operational guidelines |
| Ability to coach and mentor to transfer experiential knowledge on a one-to-one, face-to-face basis. | Ability to transfer of knowledge via products, services, and documented processes |

(source: Dalkir, 2013).

### 8.3.3 The Role of Tacit Knowledge in Disaster Preparedness and Decision Making

Within the realm of DRR, the incorporation of indigenous knowledge, which is a sort of tacit knowledge inherent within a community, assumes a significant role in enhancing the community's capacity to effectively respond to and mitigate the impact of catastrophes. However, in order to ensure comprehensibility and widespread distribution within the broader community, it is necessary to formalise tacit knowledge (Aksa, 2021) in order to enhance comprehension among the present generation, it is important to facilitate the process. Externalisation refers to the cognitive process of transforming tacit knowledge into explicit knowledge. In addition to accumulated experience and temporal advancements, it is indisputable that the general awareness of disaster preparedness among the public will persistently evolve.

Indigenous communities exhibit a relatively receptive attitude towards ongoing developments. The necessity of making improvements to tacit knowledge while preserving local wisdom is highly imperative. The integration of disaster risk reduction (DRR) expertise with locally derived knowledge has been facilitated through active community engagement and the inclusion of significant traditional leaders. Providing scientific assistance to individuals who maintain steadfast beliefs, particularly in the context of calamities, poses a considerable challenge. Effective communication and

conversation with key stakeholders, including pivotal personalities and traditional healers, holds significant importance for governmental bodies and agencies involved in crisis management.

## 8.4 Case Studies of Local Knowledge and Disaster Management

### 8.4.1 Learning from Local Knowledge

The term local knowledge encompasses a wide-ranging idea that pertains to the knowledge held by individuals who have resided in a certain geographic region for an extended duration. Local wisdom refers to the amalgamation of knowledge, passion, and communal endeavours inside a specific community, aimed at addressing a multitude of issues encountered by that group, including the management of natural calamities. Local wisdom emerges from traditional knowledge systems and evolves through the accumulation of knowledge and cognitive patterns that embody ideals of wisdom deeply embedded within the cultural fabric of a traditional society, acquired over an extended duration (Mitchell et al., 2004).

The efficacy of local wisdom in effectively mitigating disasters, both through direct and indirect means, has been well-documented. Various manifestations of indigenous knowledge in addressing catastrophes and natural calamities may take the shape of technological advancements, institutional regulations, and adherence to established protocols, organisational frameworks, proactive measures, or ingrained practices.

a) Tengger community is predominantly located in the vicinity of Mount Bromo, spanning across Lumajang, Probolinggo, Pasuruan, and Malang Regencies. The Tengger Tribe and Mount Bromo share a profound connection, encompassing both cultural customs and spiritual beliefs rooted in Hinduism. The prevailing perception among the majority of individuals is that volcanic eruptions are seen as catastrophic events, although the Tengger Tribe holds a contrasting viewpoint. The eruption of Mount Bromo holds significant cultural and spiritual significance for the Tengger Tribe, as it is perceived as both a divine favour and a cautionary message from a higher power, emphasising the importance of gratitude and virtuous actions. According to Muchlisin (2020), a mere 10% of the Tengger tribe saw the eruption of Mount Bromo as a calamity due to its detrimental effects on gardens, house roofs, and other related aspects. Conversely, the overwhelming majority, comprising 90% of the tribe, view the eruption as a fortuitous event. The Tengger tribe perceives the eruption of Mount Bromo as a fortuitous occurrence.
b) Despite the temporary paralysis of both the agricultural and tourism sectors during the eruption, it is believed that subsequent to this event, there will be a notable surge in crop production and tourist visitations. The rationale behind this phenomenon can be attributed to the Tengger community cultural belief system, wherein the eruption of Mount Bromo is seen as a symbolic indication of their ancestors engaging in celebratory activities or undertaking the construction of a palace. According to the Tengger community, this event is perceived as a precursor to the eventual attainment of affluence once the eruption subsides.
c) Ammatoa Kajang community, located in South Sulawesi, represents an indigenous people that has demonstrated remarkable resilience in preserving its cultural heritage across several generations. "*Tallasa kamase-masea*" serves as the fundamental framework upon which individuals establish and develop settlements,

engage in various settlement-related endeavours, and lead their lives in a more comprehensive manner. The Ammatoa Kajang tribe regularly adheres to the unwritten societal standards and principles known as "*tallasa kamase-masea*." These guidelines encompass a range of counsel, instructions, and concrete laws that dictate how individuals position themselves within both the macro and microcosms.

d) While without directly mentioning DRR, "*tallasa kamase-masea*" implies that this is the case. A zoning system creates "Heritage Forest", "Community Forest", and "People's Forest" zones, as well as sites for homes and what can and cannot be done in each zone. The results from "Heritage Forest" are to be used in accordance with established rules. With the blessing of the AmmaToa (traditional leader), communities may harvest forest resources. The "Community Forest" area, where tree felling is permitted so long as the previous cutter plants a new tree from the same seed near the felled one. The term "People's Forest" is used to describe forested regions that have been set aside for certain purposes, such as residential and agricultural use. Ammatoa Kajang's local wisdom takes the shape of norms that allude to a way of life, and they are the outcome of the city's cultural capital. Due to their eco-friendly ethos, these regulations help reduce the likelihood of devastating landslides.

In the realm of disaster management, it may be inferred that the Tengger Tribe and the inhabitants of the Ammatoa Kajang Community possess a notable aptitude for coping with calamities, as they have demonstrated an ability to coexist harmoniously with such adversities.

### 8.4.2 Collaborative Approaches for Effective Disaster Risk Reduction

Indonesia encompasses a diverse array of tribes, each characterised by distinct systems and approaches to the management of disasters. Nearly every indigenous community possesses its own traditional knowledge system, which has led to the development of innovative approaches to environmental management and the utilisation of natural resources in accordance with local customs and cultural practices. Local wisdom refers to the collective understanding, expertise, and diverse approaches adopted by local communities to address a wide range of challenges encountered in fulfilling their requirements. These demands encompass various aspects of human existence, including religion, science, economics, technology, social structure, language and communication, and art.

Local wisdom refers to a body of knowledge and insights that are derived from the collective experiences and diverse perspectives of a community in relation to their environment (Schwann, 2018). Indigenous communities possessing traditional knowledge exhibit distinct comprehension, initiatives, undertakings, and strategies aimed at preserving, enhancing, and advancing their livelihoods. The significance of local wisdom, as exemplified by adaptive behaviours towards the environment, plays a crucial role in disaster risk reduction (Suparmini et al., 2015).

### 8.4.3 Inheriting Tacit Knowledge Through Folklore and Oral Traditions

Traditional societies exhibit specific attitudes towards life, the environment, and the belief in sacred or holy entities, resulting in an inseparable interconnection between their perspectives on life, social structures, cultural practices, and ceremonial rituals. Implementing traditional rites, which are fundamental to a culture, is intrinsically linked to a people's beliefs or practices. Tengger community has a reputation for being loyal to

the traditions of their forefathers, upstanding members of society, and having close knit friends and family members (Putri et al., 2022).

The cultural, religious, and ceremonial practices employed by communities in response to volcanic eruptions serve as a significant illustration of their efforts to convey and commemorate disaster hazards and disaster risk reduction (Hariyono & Liliasari, 2018). The enduring presence of several traditional ceremonies within the Tengger Tribe serves as evidence for this assertion:

1. The Kasada Ceremony (*Yadnya Kasada*), the sacrificial festival of the Tengger tribe is observed on either the 14th, 15th, or 16th day of the Kasada month, which corresponds to the 12th month of the lunar calendar. Kasada represents an expression of appreciation exhibited by the Tengger Tribe towards Sang Hyang Widi, as a result of the latter's provision of sustenance and means of survival for the Tengger Tribe, mostly through the bountiful offerings of nature.
2. The Karo Ceremony commences around two months subsequent to the conclusion of the Kasada Ceremony. The objective of the Tengger Tribe is to attain a state of purity or liberation from sin. The Karo ceremony holds significance within the Tengger Tribe community as a prominent event, ranking second in importance only to the Kasada ceremony. One of the customary practices observed at the Karo Ceremony involves the installation of Sodor, which is a type of bamboo that is packed with seeds and cultivated in the Tosari District. The term "Sodor" denotes a state of concordance encompassing the harmonious relationship between individuals and the divine, as well as the harmonious interactions among individuals themselves and between individuals and the wider cosmos (Istiqomah et al., 2020)
3. The Unan-Unan ceremony constitutes a customary practice observed by the Tengger Tribe with the purpose of warding off malevolent forces and purifying the local community (Gifari et al., 2019). Unan-unan highlighted the inseparability of the Tenggerese community from their natural surroundings, thus explaining the presence of ecological elements in their offerings.
4. The Pujan Mubeng ceremony, which takes place in the ninth month of the Tengger Tribe calendar, has the purpose of purifying the village from disturbances and disasters (Sutarto & Ayu, 2006).
5. The Barikan ceremony, a ritual to ward off calamity, is typically conducted following a disaster, eclipse, or other events that impact the lives of the Tengger Tribe. The barikan ceremony is led by the village chief and the traditional shaman (Sutarto & Ayu, 2006).
6. The Liliwet ceremony, which is performed in each household, is carried out with the intention of promoting the overall welfare of the family. In the context of customary belief systems, it is customary for traditional shamans to engage in the practice of casting spells throughout various sections of a dwelling, encompassing the yard as well, with the primary objective of averting potential calamities or catastrophic events.
7. Etc.

When considering the underlying objectives of these rites, they consistently serve as a reminder for individuals to: 1) express gratitude towards Sang Hyang Widi; 2) engage in environmental preservation to mitigate the occurrence of calamities; and 3) demonstrate allegiance towards traditional authorities. The enduring presence of local wisdom, characterised by a steadfast reliance on traditional and religious institutions, has proven crucial in enhancing community resilience throughout the Mount Bromo eruption. By actively engaging these institutions in disaster risk reduction efforts, the

community's capacity to effectively respond and recover from the eruption has been significantly bolstered.

### 8.4.4 The Impact of Local Knowledge on Disaster Response and Resilience

Traditionally, society has inherited knowledge regarding the protection of nature and the environment. Communities have engaged in environmentally adaptive behaviour for generations to protect themselves from natural disasters. This is evident in disaster-prone areas of Indonesia that are still uninhabited; they coexist peacefully with natural disasters. Tribes with local knowledge share similar understandings, programs, activities, and methods for sustaining, enhancing, and advancing their way of life. Local knowledge that takes the form of environmentally adaptive behaviour plays an essential role in DRR (Suparmini et al., 2015).

Communities have engaged in environmentally adaptive behaviour for generations to protect themselves from natural disasters. Each individual and society responds to natural disasters differently. This response is contingent on the significance that society places on a few factors that influence an individual's attitude or behaviour. These include knowledge, trust, commerce, and infrastructure that support community action in the event of a disaster.

## 8.5. Conclusion

Rural communities typically reside for extended periods of time, spanning multiple generations. In the realm of disaster risk, individuals possess the ability to reside within the framework of DRR due to several factors. Firstly, their prolonged residency in a particular area facilitates proximity to their neighbours, thereby fostering a sense of community and collective support. Secondly, they acquire an innate understanding of natural indicators that manifest in the vicinity of their settlements, which can be classified as tacit knowledge. Thirdly, their adherence to religious, ethnic, and traditional leaders engenders a culture of obedience, thereby promoting adherence to DRR measures. These are just a few examples of the various factors that contribute to their capacity to live within the DRR framework.

The process of urbanisation and modernisation has had a transformative impact on local knowledge within village communities, leading to a gradual erosion of social capital in the context of DRR. The government, specifically the BNPB, is endeavouring to enhance the capability of rural communities by implementing the DESTANA program. DESATA invites village communities to reduce disaster threats and vulnerabilities and enhance preparedness capacity, which is planned and implemented by the community as the main actor. Regarding DRR knowledge, DESTANA has the potential to be utilised as a motor to externalise tacit knowledge into explicit knowledge that is readily understood by the current generation. Due to the fact that tacit knowledge is frequently rejected by village residents today, the community has practiced adaptive behaviour towards the environment for generations in order to fend off natural disasters.

## References

Aksa, F. I. (2019). Wisdom of indigenous and tacit knowledge for disaster risk reduction. *Indonesian Journal of Geography*, *52*(3). https://doi.org/10.22146/IJG.47321

Arif, M. (2020). *The Secret of Bromo*. Gadjah Mada University Press.

Center For Excellence in Disaster Management & Humanitarian Assistance. (2021). Indonesia Disaster Management Reference Handbook. *Joint Base Pearl Harbor - Hickam, Hawai. Https://Www.Cfe-Dmha.Org/LinkClick.Aspx?Fileticket=BcQ7lZPdVD4%3d&portalid=0*.

Dalkir, K. (2013). Knowledge Management in Theory and Practice. In *Knowledge Management in Theory and Practice*. https://doi.org/10.4324/9780080547367

Gifari, F., Muttaqin, T., & Ramadhan, R. (2019). Kajian Kearifan Lokal Masyarakat Desa Ngadas Terhadap Pengembangan Ekowisata di Taman Nasional Bromo Tengger Semeru Jawa Timur. *Journal of Forest Science Avicennia*, *2*(2). https://doi.org/10.22219/avicennia.v2i2.9406

Hariyono, E., & Liliasari, S. (2018). Disaster Mitigation Model of Eruption Based on Local Wisdom in Indonesia. In *Natural Hazards - Risk Assessment and Vulnerability Reduction*. https://doi.org/10.5772/intechopen.79217

Istiqomah, C., Ahmad, H., & Nugrahani, A. (2021, October). Denotative, Connotative And Mythic Meanings Of The Karo Ceremonial Rituals Of The Tengger Tribe Community (Semiotic Study). In *Proceedings of the National Seminar on Literature, Lingua and Learning* (Salinga), 1(1), pp. 650-657.

Mitchell, B., Setiawan, B., & Rahmi. (2004). Pengelolaan Sumberdaya dan Lingkungan. *Gajah Mada University Press, Yogya*.

Peraturan Kepala Badan Nasional Penanggulangan Bencana Nomor 1 Tahun 2012 tentang Pedoman Umum Desa/Kelurahan Tangguh Bencana. (2012). *Peraturan Kepala Badan Nasional Penanggulangan Bencana Nomor 1 Tahun 2012 tentang Pedoman Umum Desa/Kelurahan Tangguh Bencana*.

Putri, F. K., Noven, H. J., Nurcahyati, M., N., I. A., Septiasari, A., Batoro, J., & Setyawan, A. D. (2022). Review: Local wisdom of the Tengger Tribe, East Java, Indonesia in environmental conservation. *Asian Journal of Ethnobiology*, *5*(1). https://doi.org/10.13057/asianjethnobiol/y050103

Rozi, S., & Taufik, Z. (2020). Adaptation of Religion and Local Wisdom in Global Environmental Issues in Indonesia. *Religious: Jurnal Studi Agama-Agama Dan Lintas Budaya*, *4*(3). https://doi.org/10.15575/rjsalb.v4i3.9593

Schwann, A. (2018). Ecological wisdom: Reclaiming the cultural landscape of the Okanagan Valley. *Journal of Urban Management*, *7*(3). https://doi.org/10.1016/j.jum.2018.05.004

Suparmini, S., Setyawati, S., & Sumunar, D. R. S. (2015). Mitigasi Bencana Berbasis Kearifan Lokal Masyarakat Baduy. *Jurnal Penelitian Humaniora*, *19*(1). https://doi.org/10.21831/hum.v19i1.3511

Sutarto, & Ayu. (2006). Sekilas tentang Masyarakat Tengger. *Jelajah Budaya. Kajian Sejarah Dan Nilai Tradisional Yogyakarta. Https://Repositori.Kemdikbud.Go.Id/1106/1/Masyarakat_Tengger.Pdf*.

Twigg, J. (2007). Characteristics of a disaster-resilient community: a guidance note. *Natural Hazards Review*.

Walia, A., & Guleria. (2012). Sushma. Village Disaster Management Plan. *National Institute of Disaster Management. New Delhi. Https://Nidm.Gov.in/PDF/Modules/Village.Pdf*.

# CHAPTER 9: ECONOMIC AND SOCIAL SUSTAINABILITY IN VILLAGE AREA PLANNING

***Authors: Dian Dinanti, Gunawan Prayitno, and Fadly Usman***

## Abstract

Village area planning is a systematic process that involves designing and regulating land use, infrastructure and resources in a rural area. The aim of village area planning is to create a sustainable environment, promote a good quality of life for village residents, and optimise the use of natural and human resources. Village area planning is an important tool for achieving sustainable development, improving the quality of life of village communities, and protecting the natural environment. Economic and social sustainability is an important aspect in village area planning. This involves efforts to ensure that development and economic growth as well as social welfare in the village take place in a sustainable manner, so that it not only meets the needs of the current generation, but also does not harm future generations. Economic and social sustainability in village area planning requires an integrated approach that considers economic, social and environmental aspects. This aims to create a village that is strong, prosperous and able to adapt to changes that occur over time. This chapter will discuss in seven sections which include an introduction, understanding sustainable development in rural areas, economic development in village area planning, environmental sustainability in village area planning, partnerships with the private sector for economic growth, monitoring, and evaluation of sustainable development.

**Keywords:** village planning, economic and social, sustainability

## 9.1 Introduction

A significant problem in the development of a village is the requirement for sustainable village planning. Two main concepts—village planning and sustainable development—as well as their connections, will be covered in the introduction section. During this section, some preliminary findings will be discussed regarding the importance of sustainable village planning, specifically in the economic and social pillars, to improve the welfare of rural communities.

A place is constantly subject to different pressures and shocks from natural and human forces. In all areas, including job creation, the delivery of basic services, and the planning and management of green spaces, the region is experiencing new and persistent pressures. A strategy called regional planning is required to address the dynamics of development. To avoid or lessen negative effects, this entails updating responses to environmental changes. Planning is also described as safeguarding human, financial, living, and non-living resources to satisfy human needs and enhance the standard of living. Sustainable development is frequently used in the execution of regional planning to achieve this.

In order to meet the needs of the present without compromising the capacity of future generations to meet their own needs, development must be sustainable. Two key ideas, namely needs and limitations, are related to this definition. Priority must be given to the needs of the world's poor, especially their basic needs. While restrictions are the

*Dian Dinanti*, Gunawan Prayitno, and Fadly Usman*
**email: dinanti@ub.ac.id*
https://doi.org/10.11594/futscipress35

environment's capacity to force technological development to meet present and future needs.

## 9.2 Understanding Sustainable Development in Rural Areas

Along with economic factors, sustainable development must consider social and ecological factors. Sustainable development can be viewed as a three-way framework involving the interaction of three complex economic, social, and environmental systems. Sustainable development is supported by three pillars: the economic, the environmental, and the social pillars (Peng, 2023; Zepharovich et al., 2021) (Figure 9.11).




**Figure 9.11** Three Pillars of Sustainable Development

1. Economic Pillar: Three factors comprise the economic pillar: employment, foreign investment, and exports.
2. Environmental Pillar: The environmental pillar has three requirements, including ecosystem function, soil fertility, and biodiversity.
3. Social Pillar: The social pillar comprises three criteria: health, poverty, and the standard of work.

The SDGs add four goal dimensions—inclusive social development, economic development, environmental sustainability, and peace and security—to the MDGs' primary objective of reducing poverty. The SDGs take a significantly more extensive approach to sustainable development than the MDGs. The SDGs provide a more people-centred development agenda than the MDGs, which only contain a few concepts related to human rights, equality, empowerment, and equality (Fahrurroji et al., 2023) (Figure 9.12).




**Figure 9.12** Sustainable Development Goals (source: un.org).

Planning for rural development must consider socioeconomic development because it is closely related to the economic base. Therefore, it is necessary to comprehend the key elements of the social and economic development cycle, particularly how they relate to sustainable development, which is being worked on vigorously worldwide. The development of various elements, such as village potential, marketing, accelerating access, and public services, can be used to develop rural areas' social and economic aspects. Rural community growth will result in institutional growth, community involvement, and welfare improvement. Later in this book, the development initiatives for economic and social aspects of rural development planning will be discussed.

A nation's economic, social, and environmental sustainability depends heavily on rural sustainable development. Given that rural areas of the world experience the majority of poverty, this is crucial for reducing it. Therefore, coordination is crucial, and there are many advantages to be had from doing so when it comes to rural development projects that support sustainable livelihoods at the global, regional, national, and local levels as necessary. Rural development strategies must provide various approaches and consider the isolation and potential of rural areas. The main objective of any area that aims to raise people's welfare or standard of living, including rural development, is sustainable development. The degree of poverty, social inequality, and level of community welfare can all be influenced by economic and social factors, whereas environmental factors can influence the degree of environmental quality. Because economic growth will affect societal expansion, which may affect the quality of its surrounding resources, such as infrastructure, poverty, and other factors, the development of the social sector is influenced by the development of the economic sector (Fahrurroji et al., 2023).

Sustainable development limits how quickly natural ecosystems and resources are used. To raise the standard of living and welfare of the community, careful village area planning is required in sustainable development. Planning in a village usually involves multiple parties because its political viability depends on the community's full support through its Government, social institutions, and commercial activities, and its successful implementation requires integrated policies, planning, and social learning processes. Therefore, achieving sustainable village development requires the participation of numerous parties. Sustainable village development can be achieved using top-down and bottom-up planning (Legi & Pombengi, 2015).

# 9.3 Economic Development in Village Area Planning

## 9.3.1 The Significance of Economic Planning for Rural Communities

One strategy for achieving village economic independence is rural economic development. Village economic development aims to enable rural communities to live creative, healthy lives and offer various opportunities for personal growth. The connections between the economic and social systems in villages will be discussed in this section, along with the value of economic planning for rural communities and strategies for rural economic development to increase employment opportunities and village economic growth.

Economic planning is a strategy used to realise the objectives with a well-organised economic ecosystem and pre-planned objectives and processes. Making the most of allocating scarce development funding sources requires economic planning. Additionally, economic planning is crucial for achieving economic stability. Wibowo (2018) lists the following stages that can be completed during the economic planning process:

1. Establishing objectives for economic planning, such as boosting employment, achieving income equality, reducing poverty, and other objectives.
2. The planning process includes measuring available resources, such as export revenues, the availability of skilled labour, Government and foreign revenue assistance, and other resources required.
3. Choice of applications and equipment to be used in order to meet the objectives.
4. To achieve the initial goals, work on choosing significant and reliable programs and tools free from resource and organisational constraints.

## 9.3.2 Analysing The Impact of Economic Development on Community Well-being

Well-being is a good physical, social, and mental state derived from various shared possessions and connections to others and places. It necessitates that basic needs be satisfied and improved through empowering interpersonal connections, stable finances, employment, good health, and a beautiful and healthy environment (Dahlia & Azmizam, 2014; Rachel et al., 2012). Long considered a key economic policy objective, raising material living standards has come under fire in recent years from those who claim that doing so will not significantly improve well-being. According to welfare economics, income and welfare have a positive relationship (Kawanaka, 2014). Understanding the real link between income and well-being is essential for evaluating these policies.

The proceeds from economic development can be used to raise the standard of living for society as a whole if they are used with consideration for the values and aspirations of the community. Additionally, it can foster empowerment, increase capability, and improve individual and collective resilience. According to Senevirthna and Dharmadasa (2021), the effects of global economic development are thought to be a highly effective means of significantly lowering income risk and promoting greater household welfare in developing nations. In the last several decades, there has been an increase in non-agricultural activities in rural areas, allowing them to earn additional income to help improve living conditions (IFAD, 2011). In rural areas, it is evident that higher income satisfies the need for community welfare (Chan & Acharya, 2002). Succinctly put, scholars and decision-makers concur that economic development determines the subjective welfare of society in both developed and developing countries (Mohammed, 2018). As a

result, most rural residents can increase their income through side jobs to maintain a high standard of living and secure financial futures.

Life expectancy is one of the best tools for measuring a country's development, which is used to show trends in health status across all nations (Alam et al., 2016). The Government's priorities include improving its citizens' living conditions and fostering economic growth (Kwakwa, 2019). Even though economic growth is regarded as a key indicator to raise a country's standard of living, it is not the best option for a country without quality of life. It also mentioned that life expectancy is important to the insurance sector, healthcare organisations, the pharmaceutical industry, and aged care providers. Life expectancy has increased because of ongoing income growth and intensifying economic expansion. The community's high life expectancy directly results from a strong tendency to raise per capita income (Shahbaz et al., 2016). The amount of money invested in raising social indicators like health, education, pension plans, sanitary systems, quality food facilities, and environmental status determines how quickly life expectancy increases. Numerous factors affect the relationship between economic growth and life expectancy.

1. Education is the first consideration, demonstrated by economic growth being a significant catalyst for raising educational standards and improving people's health and life expectancy (Shahbaz et al., 2016).
2. The second factor is gender equality, wherein women's increased participation in economic growth increases their capacity to create a wholesome society, raising life expectancy.
3. The simplicity of using fundamental facilities makes up the third factor, which implies that better living conditions for those whose life expectancies are rising will result from developing the most effective health and educational facilities (Alam et al., 2016).

### 9.3.3 Addressing Social Inequality and Ensuring Social Justice in Rural Development

Village-based, top-down industrialisation and urbanisation in highly populated areas result in the expansion of rural areas through significant land use fragmentation, necessitating planning interventions. Planning biases include plan-driven spatial changes without corrective mediation between villages. There has been a shift in the institutional governance of jurisdiction ranging from villages to cities due to the expansion of rural areas. For villages to be included as rural units in integrated cities, planning-related inequalities between villages must be eliminated to establish initial equality based on socio-spatial justice.

The governance practices of rural villages are deeply rooted in principles of justice and equality. Village-based collectivities encounter numerous difficulties as the economy shifts away from agriculture. According to "uncoordinated growth" based on suboptimal land use, small-scale, self-sufficient land development driven by bottom-up market forces is described (Batty & Chin, 2003). The economy will suffer if limited land resources are not used productively. Social tension is frequently a result of poor economic performance in less developed nations(Zhu, 2017).

### 9.3.4 The Role of Social Planning in Improving Community Welfare

Social planning is the process by which decision-makers, including legislators, government organisations, planners, and frequently funders, attempt to address societal issues or improve societal conditions by creating and putting policies meant to produce specific results into place. There are countless ways that these policies can be implemented, including through laws, rules, incentives, media campaigns, services, or information. Social planning can be used to further objectives unrelated to the welfare or advancement of those impacted. One of these objectives could be to provide for the community. Additionally, community involvement can shield social planning from going wrong (Rabinowitz, 2017).

When policymakers take the initiative, they may be unaware of community participation. Therefore, raising these issues and ensuring that communities are involved in the process is, in part, the responsibility of community leaders and activists. If social planning is done in a spirit of community partnership, it can be a powerful tool for organising and enhancing community welfare and changing policies. It is more likely that this process will have favourable and long-lasting effects on society if policymakers can make it inclusive and participatory.

### 9.3.6 Promoting Inclusivity and Community Participation in Development Initiatives

The term "participation" is frequently used in other concepts in community development, including "engagement," "involvement," "co-creation," "co-design," and "co-production" (Vanleene et al., 2015). Participatory planning is a development strategy and method of involving the public in decision-making; however, it heavily depends on public awareness and desire to be involved. Through a participatory planning process, efforts at rural development need to be approached in a variety of ways, including:

1. Limiting the potential that the local community can build.
2. Using the right technology includes creating, developing, and disseminating it for rural communities.
3. Step three is to foster supervisory/supporting organisations that connect the development work done by individual community members with other institutions or at a higher level (sub-district, district, provincial, national).
4. To foster supporting policies, specifically those dealing with inputs, costs, credit, markets, and other issues.
5. To foster business organisations or implement units that apply appropriate technologies to achieve development goals.

The Government must also become more active in society, fostering and establishing communication with the community to increase community participation or participation in the development process. The community should understand the importance of participating in development and feel responsible for its success to ensure its welfare. The Government should provide this understanding.

## 9.4 Environmental Sustainability in Village Area Planning

Rural areas and ecosystems suffer greatly from unchecked urban expansion. In response to the issues that rural areas face, the Government defines sustainable development as "strong agriculture, beautiful villages, and rich farmers" when it refers to those areas. The Government has also developed a strategic plan to make sure that

programs and practices can aid villages in achieving sustainable development. Rural areas will experience greater environmental sustainability due to sustainable development that emphasises environmental sustainability in villages.

It is challenging to solve some issues through environmental protection, effective use of local resources, targeted promotion of each industry reliant on unique resources, etc. To direct human activities in producing economic value equating to lower environmental costs, identification and protection of the environment are important tasks (Liu et al., 2015). The creation of eco-villages is one of the ways the Government works to address environmental and climatic issues that affect the built environment and villages. It serves as a test for the creation of tools and procedures to assist in problem-solving at the village level, with the ultimate goal of reducing the environmental impact of activities in rural areas and improving village planning as well as regular village development (Yin, 2014). Additionally, to create environmentally friendly villages, it may be necessary for other authorities and institutions in the fields of energy, water, and traffic to address several environmental issues that are outside the scope of the planning sector. To address several environmental issues it may be necessary to reorganise some institutions. According to village planners, the development of eco-village communities and the fundamental concept of localism have a spatial component, which is the primary focus of the village planning profession.

As a new development strategy and concept, sustainable rural development is understood as a paradigm of social structure that achieves population, resource, environmental, and economic coordination. Developers, administrators, and policymakers are concerned about efficiently using natural resources due to a lack of energy, hazardous environmental conditions, and mounting pressure from an escalating population in various rural areas (Mondal & Palit, 2022). The management of environmental damage and resource efficiency requires a comprehensive policy framework. Understanding the roles of different stakeholders is crucial for managing ecological preservation (Mansourian et al., 2020) to clearly understand the system under study. The following are a few techniques that can be used to manage sustainable resources and ecological preservation:

1. Cooperative management (Charnley et al., 2017)
2. Ecological diversity, a crucial strategy for preserving ecological integrity, can benefit the environment more quickly (Dymond et al., 2014).
3. Promote knowledge transfer so people can understand the value of conventional ecological knowledge (Hosen et al., 2020).
4. Obtain institutional and policy backing (Charnley et al., 2017).
5. Another method for enhancing ecological sustainability is through sustainable farming methods, which foster better relationships between people and the environment (Bhalerao et al., 2022).

## 9.5. Partnership with the Private Sector for Economic Growth

Public-private partnerships (PPPs) are more advantageous to the Government because they involve the private sector not only as an executive branch but also as a source of sponsorship, even though achieving these goals requires many resources (Beauregard, 1998). However, the advantages of this strategy beyond just the financial aspect has also demonstrated positive benefits in bettering public-private partnerships, improving risk management, and making government policies more transparent, among other things (Tang et al., 2010) (Figure9.13).

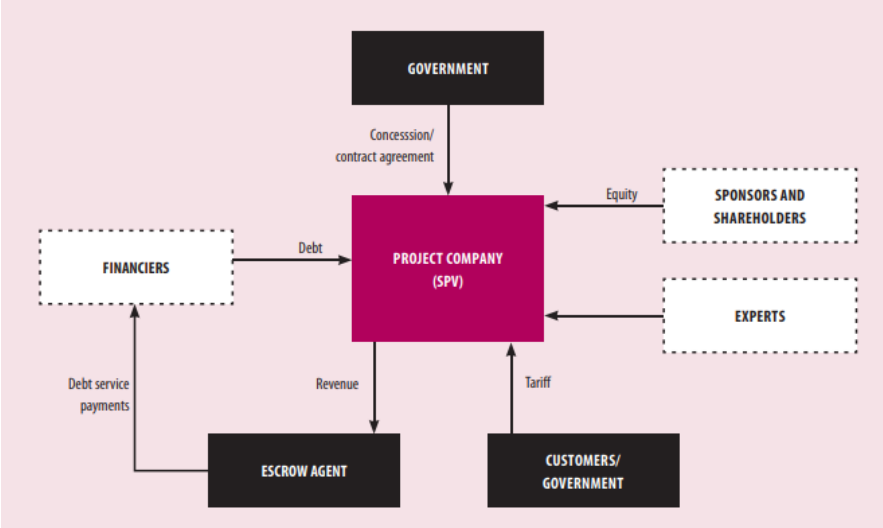



**Figure 9.13** Typical structure of a PPP project (source: UN ESCAP (United Nations Economic and Social Commission for Asia and the Pacific), 2011)

Balancing the economy through rural development has received much attention on a global scale, especially considering remote villages that have been abandoned (Ashley & Maxwell, 2001). The village, which serves as an economic, social, and cultural unit, is the fundamental building block of rural development and contributes significantly to the widening rural-urban divide (Li et al., 2019). Strategies like PPPs, which rely on a wider range of resources and capabilities, can also be effective. When used strategically and tactically, public-private partnerships can boost rural economies and global food security (Smyth et al., 2021).

PPP implementation has the potential to be very beneficial for the nation. The PPP concept can be used or abused in various industries. Besides infrastructure projects, the PPP concept can also be applied to non-infrastructure projects. PPP has several benefits that have led many nations to adopt it as one of the guiding principles for managing state assets, including (Priadi, 2016):

1. PPP produces income for the state.
2. PPP reduces the amount of money the Government must invest in a project.
3. PPP can maximise the use of underutilised resources.
   PPP can provide public services that the Government was previously unable to provide.

Several private sectors now recognise how critical it is to address environmental change. The financial industry has acknowledged that managing business risks and ensuring long-term returns on investment depend on addressing global environmental challenges like climate change. Climate change is predicted to harm Indonesia's economy, people's quality of life, and environmental carrying capacity. The Government must take climate-based action, also known as climate change adaptation, to lessen the effects of climate change on the environment and vulnerable communities. It has also grown to be of particular concern to the Indonesian Government, making enhancing human resilience to climate change a priority following the 2020–2024 National Medium-Term Development Plan (RPJMN) (Center for Climate Change and Multilateral Policy, 2020).

**Fighting climate change and other environmental issues** can be accomplished in various ways by mobilising eco-friendly investment development cooperation providers.

They use lending and mixed financing to entice private capital and use collateral to reduce the risk of private financing of renewable energy technologies when political and commercial risks lower the return on investment. Additionally, to enhance the policy environment that supports private climate investment and **promote green private sector development** as a provider of development cooperation with partner nations. This assistance takes the form of, for instance, assisting in eliminating fossil fuel subsidies, which raises the profitability of investments in green energy, and establishing feed-in tariffs for specific renewable energy technologies. In a broader sense, this support encourages partner governments to develop new markets and critical institutional and technical capacities, empowering those governments to attract and maintain long-term green investment.

## 9.6 Monitoring and Evaluation for Sustainable Development

### 9.6.1 The Importance of Monitoring Progress in Economic and Social Development

Ecology, village planning, land management, economy, preservation of cultural heritage, transportation, agriculture, tourism, and other areas all involve sustainable development. Due to the various environmental, social, and economic factors that affect sustainable development, the goals of monitoring and evaluating it may change. The indicators must be generalised for further mathematical development and thorough evaluation, even though particular methods and organisations study each group of factors. Thus, monitoring and evaluation are reflexive functions of a sustainable development system that control behaviour by considering both experience and the potential for operating other systems that interact with it, such as the building, education, health, and service industries (Yaakup et al., 2005).

Monitoring certain facets of economic and social development is frequently confused with evaluating broad patterns in fundamental requirements, such as the proportion of the population experiencing extreme poverty or the detrimental effects of the recession on the availability of fundamental social services. It is essential to have monitoring that must be carried out to ensure that the goals outlined in the economic and social development policies are realised. Designing the next policy cycle can also be assisted by tracking results during the implementation phase. As a result, there are no policy gaps between policy cycles. In the interim, monitoring during the implementation phase is typically carried out annually and aids in tracking policy outcomes in the short term. However, this kind of evaluation is not always helpful for impact assessments that are not evident in the short term.

### 9.6.2 The Role of Evaluation in Adapting and Improving Village Area Planning

Village planning is crucial for creating a sustainable rural development model and serving as a crucial road map for implementing rural revitalisation strategies. For the implementation of "higher and hierarchical points" of village planning to be realised, scientific measurement of the potential for rural development is of utmost importance to effectively identify the direction and means of future development in rural areas. Han et al. chose seven categories of elements to evaluate for rural development based on three main functions: life, production, and ecology.

These various evaluation methods demonstrate that not every village can benefit from using them all. Villages of various types ought to have different planning elements.

In order to achieve effective collection, the village planning of significant planning areas, general planning areas, and fundamental control areas is gradually reduced in detail. Planning content and optimising elements in the core planning area with the highest development potential should encourage orderly village development.

### 9.6.3 Showcasing Villages with Effective Economic and Social Development Strategies

The comprehensive development of villages and rural areas is crucial for regional development, eradicating poverty, and minimising regional disparities (Budiarto et al., 2017). Poverty, livelihoods, and the environment are the main problems with rural development in developing nations (Scoones, 2009). Consequently, rural development is crucial, especially in developing nations. The case studies related to sustainable village area planning are covered in the following sections.

The Government prioritises accelerating village community empowerment in developing villages, which is the program's foundation. In order to further boost village capacity, the central Government provides transfers to the regions through the Village Fund. Numerous Indonesian regions have conducted studies on the effectiveness of village funds. Senga Selatan Village, in the Indonesian province of South Sulawesi's Luwu Regency, is one of them. Cocoa and coconuts are top commodities. The neighbourhood also participates in the fishing industry by growing seaweed and maintaining sea ponds. Additionally, broiler chickens, goats, and cattle are raised in the community. Given its advantageous location and wealth of natural agricultural resources, there is potential for Senga Selatan Village to develop in the future.

The increased community involvement in development is one of the most noticeable effects of using village funds in Senga Selatan Village. Senga Selatan Village residents participate in the development process because they understand that the Village Fund is necessary for them. Depending on the needs of the community, the Senga Selatan village's Creating organisations of seaweed farmers, freshwater fish farmers, cocoa farmers, coconut farmers, fishery product management groups, pond farmers, cattle breeders, goat breeders, broiler breeders, and others are a few examples. These groups will generate many original ideas to help the Senga Selatan village grow and prosper.

### 9.6.4 Addressing Barriers to Sustainable Development in Villages

One of the crucial issues currently considered in the village's overall development is sustainability (Figure 9.14). It is intended to enhance some underprivileged villagers' social and economic well-being. According to Nori and Mini-Faskhodi, this strategy aims to spread development advantages to the poorest residents of rural areas who work to support their families (Nori & MiniFaskhodi, 2008). It may be necessary to address the structural issues with the Government, find employment for the unemployed in rural areas in the service industry to entice farmers to move to the industrial sector, and support innovative farmers in implementing new agricultural technologies in the industrial sector, and also encouraging innovative farmers to adopt new technologies in the agricultural sector to combat this issue. In order to eliminate the problem of price policy, the Government must guarantee prices for agricultural products such as wheat purchased through cooperatives to prevent the smuggling of domestic products. Adopting this policy will reduce agricultural risk. Policymakers can conduct needs analyses and hold farmer-specific courses to address the low skill levels of farmers.

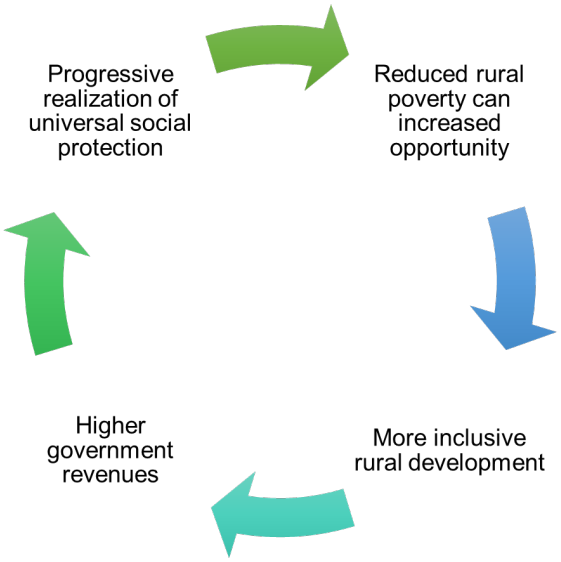



**Figure 9.14** Overcoming the structural challenges to develop sustainable villages.

Additionally, due to financial limitations, the Government may think about changing contribution programs to consider jobs common in rural areas and offering more flexible payment options to account for seasonality and fluctuating income. Offering subsidies to poor people can also increase participation in social insurance programs. The Government also uses digital technology to reach rural populations with social protection services. However, efforts to bridge the digital divide in rural areas must be stepped up to ensure everyone can access these services. Digital technology cannot create a new barrier to service access for those lacking digital tools or knowledge, which must be kept in mind to increase connectivity in rural areas. Steps to reduce the digital divide, such as teaching digital literacy, must be taken in addition to the application of technological innovation.

### 9.6.5 Strategies for Enhancing Community Capacity and Participation

The community's ability to drive these efforts and provide input to sustain benefits impacts participation in achieving community development goals (Atinga et al., 2019). Participation in the community boosts social capital, widens social networks, facilitates problem-solving, boosts self-assurance, and fosters a sense of community (Raba'ah Hamzah et al., 2015). The goal and means of community development are seen as being community participation. Increased community participation leads to increased welfare and community development progress (Merino & de los Ríos Carmenado, 2012).

Collaboration between various stakeholders must be encouraged, and different organisational cultures must be incorporated into joint initiatives. Sustainable development heavily emphasises collaboration. Performance in sustainable development can be impacted by interpersonal skills and emotional intelligence (Malik, 2022). In other words, sustainable development necessitates a cooperative strategy involving numerous actors and information flows. A structured methodology is required to support decision-making and direct collaboration with internal and external actors.

Partnerships support the process of sustainable development in addition to enhancing collaboration between stakeholders and sectors. Local governments are anticipated to take the lead in achieving sustainable development by evaluating the local environment, identifying resources and needs, forming partnerships with stakeholders,

and putting appropriate policies and projects into place (Satterthwaite, 2017). Cross-sectoral collaboration is essential to achieving the scale and long-lasting impact we require. These collaborations can lead to new methods of working, mobilise resources and expertise that are difficult to access, and establish shared accountability in a world that is becoming more complex.

## 9.7 Conclusion

Communities that practice sustainable development look for ways to develop their economies while improving their quality of life and local environment. A framework for sustainable development is provided so that people can make the most of their limited resources, build effective infrastructure, safeguard and improve their quality of life, and start new businesses to boost their economies. Because of this, cooperation between the national and regional governments is necessary to realise sustainable village development and build high-quality infrastructure that meets the needs of rural communities.

Sustainable development is a road map for all countries to advance and eradicate poverty. Indonesia's approach to finding a more accessible and affordable definition of sustainable development is to focus on sustainable development in rural areas. As a result, there are high participation rates, and the sustainable development goals are closer to and more applicable to the villagers. So, the villagers are expected to reap the benefits as soon as possible.

## References


Alam, Md. S., Shahbaz, M., & Paramati, S. R. (2016). The Role of Financial Development and Economic Misery on Life Expectancy: Evidence from Post Financial Reforms in India. *Social Indicators Research*, *128*(2), 481–497. https://doi.org/10.1007/s11205-015-1040-4

Ashley, C., & Maxwell, S. (2001). Rethinking Rural Development. *Development Policy Review*, *19*(4), 395–425. https://doi.org/https://doi.org/10.1111/1467-7679.00141

Atinga, R. A., Agyepong, I. A., & Esena, R. K. (2019). Willing but unable? Extending theory to investigate community capacity to participate in Ghana's community-based health planning and service implementation. *Evaluation and Program Planning*, *72*, 170–178. https://doi.org/https://doi.org/10.1016/j.evalprogplan.2018.10.001

Batty, E. M., & Chin, B. N. (2003). *Traffic, urban growth and suburban sprawl*.

Beauregard, R. A. (1998). *Public-private partnerships as historical chameleons: The case of the United States. In Partnerships in urban governance: European and American experiences*. Palgrave Macmillan UK.

Bhalerao, A. K., Rasche, L., Scheffran, J., & Schneider, U. A. (2022). Sustainable agriculture in Northeastern India: how do tribal farmers perceive and respond to climate change? *International Journal of Sustainable Development & World Ecology*, *29*(4), 291–302. https://doi.org/10.1080/13504509.2021.1986750

Budiarto, T., Rustiadi, E., & Dharmawan, A. H. (2017). Perkembangan dan kemandirian desa di Kabupaten Bogor, Provinsi Jawa Barat. *Tata Loka*, *19*(3), 230–241.

Center for Climate Change and Multilateral Policy. (2020). Enabling Environment for Private Sector Engagement in Climate Change Adaptation Projects. *Minister of Finance, Republic of Indonesia*.

Chan, S., & Acharya, S. (2002). *Facing the Challenges of Rural Livelihoods: A Perspective from Nine Villages in Cambodia*. CDRI.

Charnley, S., Spies, T. A., Barros, A. M. G., White, E. M., & Olsen, K. A. (2017). implications for resilience. *Ecology and Society*, *22*(1). http://www.jstor.org/stable/26270063

Chathurika Senevirathne, S., & Dharmadasa, S. (2021). Income diversification and household welfare in Sri Lanka. *Journal of Agriculture and Value Addition*, *4*(1), 1–22. https://www.researchgate.net/publication/356834140

Dahlia, R., & Azmizam, A. R. (2014). Happiness Index towards Sustainable and Livable Cities in Malaysia. *43rd Annual Conference of the Urban Affairs Association*.

Dymond, C. C., Tedder, S., Spittlehouse, D. L., Raymer, B., Hopkins, K., McCallion, K., & Sandland, J. (2014). Diversifying managed forests to increase resilience. *Canadian Journal of Forest Research*, *44*(10), 1196–1205. https://doi.org/10.1139/cjfr-2014-0146

Fahrurroji, M., Aziz, Y. M., Purba, Z. T., & Andita, R. N. (2023). *Mengintegrasikan Aspek Sosial, Politik, dan Lingkungan dalam Mendorong Pertumbuhan Ekonomi pada pembangunan Negara sedang Berkembang*.

Han, Z., Liu, Y., Zhong, M., Shi, G., Li, Q., Zeng, D., Zhang, Y., Fei, Y., & Xie, Y. (2018) Influencing factors of domestic waste characteristics in rural areas of developing countries, *Waste Management,* 72, 45-54. https://doi.org/10.1016/j.wasman.2017.11.039.

Hosen, N., Nakamura, H., & Hamzah, A. (2020). Adaptation to Climate Change: Does Traditional Ecological Knowledge Hold the Key? *Sustainability*, *12*(2). https://doi.org/10.3390/su12020676

IFAD. (2011). *Agriculture: Pathways to Prosperity in Asia and the Pacific*. IFAD.

Josaiman, S. K., Faisal, M. N., & Talib, F. (2021). Social sustainability adoption barriers in supply chains: A middle east perspective using interpretive structural modeling. *International Journal of Operations and Quantitative Management*, *27*(1), 61–80. https://doi.org/10.46970/2021.27.1.4

Kawanaka, T. (2014). Making Democratic Governance Work: How Regimes Shape Prosperity, Welfare, and Peace by Pippa Norris, New York: Cambridge University Press, 2012, xii + 281 pp. *The Developing Economies*, *52*(1), 88–90. https://doi.org/https://doi.org/10.1111/deve.12037

Kwakwa. (2019). *Ghana's economic growth and welfare issues* (96019).

Legi, R., & Pombengi, J. d. (2015). Implementasi Pendekatan Bottom-Up Dalam Perencanaan Pembangunan Desa Di Kecamatan Tumpaan Kabupaten Minahasa Selatan. *Jurnal Administrasi Publik*, *1*(10).

Li, Y., Fan, P., & Liu, Y. (2019). What makes better village development in traditional agricultural areas of China? Evidence from long-term observation of typical villages. *Habitat International*, *83*, 111–124. https://doi.org/https://doi.org/10.1016/j.habitatint.2018.11.006

Liu, X., Li, Z., Liao, C., Wang, Q., Zhu, A., Li, D., Li, Y., & Tang, Z. (2015). The development of ecological impact assessment in China. *Environment International*, *85*, 46–53. https://doi.org/https://doi.org/10.1016/j.envint.2015.08.004

Malik, M. S. (2022). Impact of Collaborative Innovation Capability and Emotional Intelligence on Sustainable Innovation Performance with Mediation of Employee Burnout. *Journal of Contemporary Issues in Business and Government*, *28*(2).

Mansourian, S., Parrotta, J., Balaji, P., Bellwood-Howard, I., Bhasme, S., Bixler, R. P., Boedhihartono, A. K., Carmenta, R., Jedd, T., de Jong, W., Lake, F. K., Latawiec, A., Lippe, M., Rai, N. D., Sayer, J., Van Dexter, K., Vira, B., Visseren-Hamakers, I., Wyborn, C., & Yang, A. (2020). Putting the pieces together: Integration for forest landscape restoration implementation. *Land Degradation & Development*, *31*(4), 419–429. https://doi.org/https://doi.org/10.1002/ldr.3448

Merino, S. S., & de los Ríos Carmenado, I. (2012). Capacity Building in Development Projects. *Procedia - Social and Behavioral Sciences*, *46*, 960–967. https://doi.org/https://doi.org/10.1016/j.sbspro.2012.05.231

Mohammed, U. U. (2018). Income Diversification and Wellbeing among Staff of Kaduna State University. *Ife Social Sciences Review*, *26*(1), 57–65. https://issr.oauife.edu.ng/index.php/issr/article/view/54

Mondal, S., & Palit, D. (2022). Chapter 2 - Challenges in natural resource management for ecological sustainability. In M. K. Jhariya, R. S. Meena, A. Banerjee, & S. N. Meena (Eds.), *Natural Resources Conservation and Advances for Sustainability* (pp. 29–59). Elsevier. https://doi.org/https://doi.org/10.1016/B978-0-12-822976-7.00004-1

Nawaz, M. A., Seshadri, U., Kumar, P., Aqdas, R., Patwary, A. K., & Riaz, M. (2021). Nexus between green finance and climate change mitigation in N-11 and BRICS countries: empirical estimation through difference in differences (DID) approach. *Environmental Science and Pollution Research*, *28*(6), 6504–6519. https://doi.org/10.1007/s11356-020-10920-y

Nori, H., & MiniFaskhodi, A. (2008). The share of agricultural development in rural development (a case study of rural areas). *Journal of Agricultural Science*, *2*(2), 264–275.

Peng, S. (2023). Sharing economy and sustainable supply chain perspective the role of environmental, economic and social pillar of supply chain in customer intention and sustainable development. *Journal of Innovation & Knowledge*, *8*(1), 100316. https://doi.org/https://doi.org/10.1016/j.jik.2023.100316

Priadi, G. (2016, August 23). *Penerapan Konsep Public Private Partnership (PPP) Dan Konsep New Public Management (NPM) Dalam Meningkatkan Pemanfaatan Aset Negara*. Kementerian Keuangan Republik Indonesia.

Raba'ah Hamzah, S., Suandi, T., Arif Shah, J., Arif Ismail, I., & Hamzah, A. (2015). Understanding the Reasons for Malaysian Youth Participation in Volunteering Activities. *ATHENS JOURNAL OF SOCIAL SCIENCES*, *3*(1), 39–52. https://doi.org/10.30958/ajss.3-1-4

Rabinowitz, P. (2017). *Social Planning and Policy Change*. Community Tool Box.

Rachel, D., Daly, A., Huyton, J., & Sanders, L. (2012). The challenge of defining wellbeing. *International Journal of Wellbeing*, *2*(3), 222–235.

Satterthwaite, D. (2017). Successful, safe and sustainable cities: towards a New Urban Agenda. *Commonwealth Journal of Local Governance*, 3–18. https://doi.org/10.5130/cjlg.v0i19.5446

Scoones, I. (2009). Livelihood's perspectives and rural development livelihoods perspectives and rural development. *The Journal of Pasant Studies*, *36*(1), 171–196.

Shahbaz, M., Loganathan, N., Mujahid, N., Ali, A., & Nawaz, A. (2016). Determinants of Life Expectancy and its Prospects Under the Role of Economic Misery: A Case of Pakistan. *Social Indicators Research*, *126*(3), 1299–1316. https://doi.org/10.1007/s11205-015-0927-4

Shen, F., Liu, B., Luo, F., Wu, C., Chen, H., & Wei, W. (2021). The effect of economic growth target constraints on green technology innovation. *Journal of Environmental*

*Management*, *292*, 112765. https://doi.org/https://doi.org/10.1016/j.jenvman.2021.112765

Smyth, S. J., Webb, S. R., & Phillips, P. W. B. (2021). The role of public-private partnerships in improving global food security. *Global Food Security*, *31*, 100588. https://doi.org/https://doi.org/10.1016/j.gfs.2021.100588

Tang, L., Shen, Q., & Cheng, E. W. L. (2010). A review of studies on Public–Private Partnership projects in the construction industry. *International Journal of Project Management*, *28*(7), 683–694. https://doi.org/https://doi.org/10.1016/j.ijproman.2009.11.009

Trigueros, R., Jose Maldonado, J., Vicente, F., Javier Gonzalez-Bernal, J., Ortiz, L., & Gonzalez-Santos, J. (2020). Adaptation and validation to the context of physical education of the scale from the frustration of the psychological needs of physical exercise, with the inclusion of novelty as a psychological need. *REVISTA DE PSICOLOGIA DEL DEPORTE*, *29*, 91–99.

UN ESCAP (United Nations Economic and Social Commission for Asia and the Pacific). (2011). *A Guidebook on Public-Private Partnership in Infrastructure, Economic and Social Commission for Asia and the Pacific*. UN.

Vanleene, D., Verschuere, B., & Voets, J. (2015). Co-producing a nicer neighbourhood: why do people participate in community development projects? *IIAS Conference on Co-Production of Public Services*.

Wibowo, E. (2018). Perencanaan Dan Strategi Pembangunan Di Indonesia Edi Wibowo Fakultas Ekonomi Universitas Slamet Riyadi Surakarta. *Jurnal Ekonomi Dan Kewirausahaan*, *8*(1), 16–24.

Yaakup, A., Abu Bakar, S. Z., & Sulaiman, S. (2005). Integrated Land Use Assessment (ILA) for Planning and Monitoring Urban Development. *Malaysian Journal of Environmental Management*, *6*, 23–29.

Yin, Y. (2014). *Environmental Integration in Sustainable Urban Planning from an Institutional Perspective*. Royal Institute of Technology.

Zepharovich, E., Ceddia, M. G., & Rist, S. (2021). Social multi-criteria evaluation of land-use scenarios in the Chaco Salteño: Complementing the three-pillar sustainability approach with environmental justice. *Land Use Policy*, *101*, 105175. https://doi.org/https://doi.org/10.1016/j.landusepol.2020.105175

Zhu, J. (2017). Making urbanisation compact and equal: Integrating rural villages into urban communities in Kunshan, China. *Urban Studies*, *54*(10), 2268–2284. https://doi.org/10.1177/0042098016643455

# CHAPTER 10: COMMUNITY PREPAREDNESS IN FACING NATURAL DISASTERS

***Authors: Agus Dwi Wicaksono, Gunawan Prayitno, and Dian Dinanti***

## Abstract

Community preparedness is the ability and readiness of a community or group of individuals to face and respond to emergency or disaster situations. This involves planning, training, equipment, and actions taken. Community preparedness is an important element in successful and sustainable disaster management. This allows communities to respond quickly to disasters, reduce risks, and support each other during emergency situations. Community preparedness in facing natural disasters is the key to protecting lives, property and infrastructure and to reducing the impacts caused by natural disasters. Improving community preparedness in facing natural disasters requires commitment and cooperation from all levels of society, including government, non-governmental organisations and village residents. With good preparation, communities can reduce risks, act quickly when disasters occur, and help protect each other. This chapter will discuss in seven sections which include an introduction, local wisdom in disaster mitigation, local community preparedness culture, use of modern technology in disaster management, post-disaster recovery and rehabilitation, case studies of successful community preparedness.

**Keywords:** community preparedness, natural disasters, disaster mitigation

## 10.1 Introduction

Community preparedness is essential to effective disaster management because it significantly influences how communities respond to a disaster. Preparedness indeed involves proactive activities and measures to anticipate disasters and take organised and practical steps to mitigate their impact. Preparedness refers to the actions governments, institutions, and organisations take to enable families and individuals to respond quickly and appropriately to disasters to minimise material loss and loss of life. Preparedness measures include developing disaster management plans, conserving resources, and training staff. Disaster preparedness emphasises the ability to act as quickly as possible to respond quickly and appropriately to disaster situations.

Community preparedness in disaster management is essential because it will influence community actions when a disaster occurs. Preparedness is akin to disaster awareness. Knowledge and attitudes are critical indicators for measuring community disaster preparedness. Being aware of natural disasters, one should implement existing precautions or preparedness efforts. The planning that will be implemented should look at information training and make people aware from a young age. So far, many people still depend on the government for preparedness and mitigation by ignoring their own personal preparedness. Disaster awareness can be increased by integrating ongoing information and education programs into the education system. Active collaboration between disaster mitigation agencies and the mass media is crucial for achieving a safer and more effective disaster preparedness and response.

*Agus Dwi Wicaksono*, Gunawan Prayitno, and Dian Dinanti*
**email: agusdwi@ub.ac.id*
https://doi.org/10.11594/futscipress36

One way to reduce disaster risk is to take advantage of local wisdom. In practice, this local wisdom can be included in three essential principles of PRBBK, both in the sense of community development, regional development, and disaster management. Local wisdom, manifested in adaptive behaviour towards the environment, is vital in disaster risk reduction. Local wisdom that applies in a community positively impacts the community when facing and responding to a coming disaster. Local wisdom, often called indigenous or traditional knowledge, is a collection of valuable experiences, practices, and insights passed down, generation to generation from previous communities that have experienced and overcome various challenges, including disasters.

# 10.2 Local Wisdom in Disaster Mitigation

## 10.2.1 Understanding the role of local wisdom in dealing with disasters

Local wisdom often includes knowledge and intelligence related to the sustainable use of biological resources. People's trust and understanding of local wisdom often depend on the ability of the existence of this wisdom to provide actual evidence regarding its accuracy and effectiveness in daily practice. If it is proven to be accurate, local wisdom will be born. Local knowledge that develops in traditional communities contains wisdom values, generally originating from traditional knowledge and management systems. Local knowledge refers to a body of knowledge and thought patterns deeply rooted in a traditional society's culture and traditions, accumulated over a long period and often spanning several generations (Mitchell et al., 2016). Five criteria are used to assess households' preparedness level in disaster preparedness: knowledge and attitudes about disaster risks, disaster warning systems, guidelines, policies, resource mobilisation plans, and emergency response (LIPIUNESCO/ISDR, 2006). According to (IDEP, 2007), the purpose of preparedness is:

1. Reduce threats.
2. Reduce family vulnerability.
3. Reduce consequences.
4. Establish cooperation.

Local wisdom itself is often conceptualised as local policy (local wisdom), local knowledge, or local intelligence (local genius). Local wisdom not only includes practical knowledge but also attitudes, views, and the ability of the community to manage their physical and spiritual environment; this can provide resilience and the ability for the community to develop within their locality. Local wisdom itself is part of a culture. *Local wisdom* is a traditional culture that always exists in human life and society related to cultural and human resources. In a pearl of local wisdom, every culture and particular area invariably has a different outlook on life. Local wisdom indeed includes several concepts that reflect its deep and sustainable nature, and one of the critical characteristics of local wisdom is its close connection to the owner's environment and its ability to adapt to current developments. Thus, local wisdom is a rather contextual concept and is always closely related to human life and the environment in which they live. Therefore, local wisdom is a contextual culture. Wisdom often grows and develops from human experience and life. When human life experiences changes, including changes in the social, economic, cultural, and physical environment, local wisdom also tends to change and adapt.

### 10.2.2 Case studies of local communities with effective disaster mitigation strategies

According to the BMKG, the main cause of these factors is weather anomalies such as those caused by the temperature difference between the Indian Ocean and the South China Sea. The impact will become more severe when tidal wave activity coincides with cyclone activity in the area. Apart from high sea water waves flowing towards land areas, high rainfall on land has caused several district areas to suffer Such as Pacitan, often submerged in severe floods. Areas with unstable soil conditions or settlements on hillsides have a very high risk of being hit by a landslide. As a phenomenon that often recurs, tides are known to some residents of Pacitan, especially those in coastal areas. For them, this is not a new climate phenomenon. Their ancestors have known about this phenomenon for generations and provided essential signs to deal with it.

Pancer refers to a structure or physical element that functions to regulate or channel water flow, such as a dike or wall that prevents water from entering a certain area. Pancer demolition may refer to attempts to remove or damage such structures. Nevertheless, if, on the contrary, the efforts to dismantle the pancer causes the pancer to remain in the western part, then flooding will occur. Efforts to continue traditions such as Bedah Pancer after the death of a community leader are an important example of how local wisdom and culture continue in society. The community and the village government continue to carry out this tradition by evolving together. According to them, this occurred because no one else could calculate and estimate the right time and position to perform Bedah Pancer using the old method. This cooperation effort continues, and the community can still avoid flooding caused by high tides and cyclones in the Pacitan area. However, in 2017, even though the community had undergone Bedah Pancer the combination of tidal waves plus high rainfall caused Sidomulyo Village to be affected by flooding.

The orientation of dissecting pancer is no longer to reduce the risk of flood disasters but to avoid the death of their elephant grass plants along the river that leads to the estuary. When the river water discharge started to get high, many people took the initiative to dismantle the pancer to reduce the water discharge, which was usually abundant in the right and left areas of the river. The revised version of the pancer operation, which was not carried out during peak rainfall periods or when high tide arrived, actually increased the risk of flood disasters because the position of the pancer shifted further to the west. When pancer moves westward, the risk of water overflowing into rice fields and residential areas increases.

From this explanation, we can see how the issue of local wisdom, Bedah Pancer, faces the challenges of changing times in the context of residents' farming patterns. It cannot be denied that raising livestock using a cage method is considered more modern than letting livestock out to find their food. Besides, livestock can be controlled more with cages, and livestock can be controlled in the amount of food and drink accessable. This is important within the framework of cattle fattening itself. Nevertheless, this shift in livestock farming patterns later gave birth to what sociologists know as unintended consequences. A consequence that was not previously intended or foreseen. One consequence is that it increases disaster risk among coastal communities. Consequences are the logical result of people’s choices that lead to progress.

## 10.3 Culture of Preparedness in Local Communities

Local cultural wisdom plays a vital role in shaping the ethics and morality that develop in specific communities over time, especially in environmental and natural

resource management (Santoso et al., 2018). Local/traditional wisdom is not only related to the society's knowledge and understanding of people and how good the relationship between people is but also how the knowledge and customs of people and nature and the relationship between residents of this ecological society should be established. The above understanding gives the viewpoint that human beings are an indivisible existence, a unit of the universe, and a responsible behaviour that respects and maintains the continuity of all life in the universe. It transforms the anthropocentric perspective into a biocentric and eco-centric perspective. Local wisdom values embodied in a social system profoundly influence patterns of everyday human behaviour, including in their interactions with nature, where these values are internalised, practiced, taught, and passed down from generation to generation, influential in shaping human culture and behaviour.

Community-Based Disaster Preparedness (CBDP) is a program that empowers communities to take initiatives to reduce the impact of disasters in their neighbourhoods. The CBDP program is a participatory and cross-sectoral approach through mitigation measures to reduce environmental, physical health and socio-economic vulnerabilities as well as other unintended causes. The purpose of the CBDP program is to reduce the vulnerability of individual households and communities to the effects of disasters by providing information on disaster management, particularly disaster preparedness efforts, risk reduction and disaster response. The CBDP program uses a relatively simple and easy-to-implement methodology. People at the grassroots can also take appropriate measures to reduce losses and damages caused by disasters. CBDP seeks to mobilise all the potential and resources in the community to work together and contribute to protecting their lives and livelihood. The CBDP program is run by and for the community so that they can help or protect their families and other community members in the event of a disaster. Preparedness is ultimately expected to help predict disaster threats and minimise loss of life and damage to infrastructure with the aim of helping families and communities prepare for disasters from the inside out, respond, and recover. Disaster preparedness involves community involvement, one of which is through resilient villages (Saiman, et al., 2022).

One example of implementing disaster mitigation through traditional local wisdom is disaster mitigation in Kampung Naga, Tasikmalaya Regency. Two disasters threaten Kampung Naga, namely landslides and floods. The ability of the people of Kampung Naga to mitigate disasters is influenced by customs that are firmly adhered to in carrying out their lives. Traditionally, institutionalised disaster mitigation prospects are influenced by community dynamics. In traditional societies, community dynamics are protected by customs; in this case, traditions are a robust binding rope in building community order (Miftah, 2023). Preserving traditional customs and wisdom, which includes an understanding of nature and disaster mitigation measures, is essential so that it can be done from an early age through the family environment through example, bias, and invitations from parents in shaping children's attitudes and behaviour towards nature and how to deal with disasters. In Kampung Naga, the community obeys customary rules so that community dynamics are controlled by custom (Miftah, 2023). Traditional leaders' role in controlling the community dynamics is enormous. In Kampung Naga, the traditional leader or is called Kuncen. Kuncen is a key figure as well as a traditional leader in the process of inheriting and preserving traditional wisdom values. The role of custom in regulating society's relationship with nature can significantly impact society's ability to mitigate disasters.

Local wisdom in disaster mitigation includes:

1. When selecting land for housing, choose a flat place.

2. The rectangular building plan is an ideal and stable building mass in an earthquake.
3. All the connections of the structural components of the gadang house building use a peg system.
4. The column/body slope of the rumah gadang is intended so that the forces acting on the structure of the rumah gadang are more stable and sturdier.
5. Materials with a light structure.
6. The triangular arrangement on the roof forms a stable and sturdy structure.
7. The foundation of the Rumah Gadang is not embedded in the ground.
8. The pointed shape of the roof helps free it from rainwater deposits on the layers of palm fiber so that rainwater, no matter how heavy it is, will slide quickly off the roof.

Local wisdom as disaster risk reduction, especially concerning disaster-adaptive housing, cannot be simplified by simply suggesting that people return to building houses like their traditional ones. It is like the movement of turning back the ages against the very dominant determination of modernity. Of course, this is not very easy. Nevertheless, what needs to be underlined here is not just the shape of the traditional house but the philosophy's basic principles, including the main formulas for building the traditional house, which can be brought back in the contemporary context (Putra et al., 2023).

## 10.4 Embracing Modern Technology in Disaster Management

Technology utilisation for appropriate mitigation can help reduce disaster risk effectively if relevant information or scientific data is available, including, among other things, earthquake source characteristics, seabed surface shape data, and soil density data. Science and technology are vital in disaster management, especially monitoring and supervising disaster-prone areas (Karopeboka, 2014). The development of information and communication technology, particularly in the internet sector, has significantly impacted the information sector and various aspects of human life. Nevertheless, many people are still changing the method by which they disseminate information from the traditional way to the modern way by using a site as a medium for sharing information that is more practical, economical, and widely accessible anywhere. By utilising the internet, apart from users being able to see technological developments by visiting existing sites, users can also obtain various information, both domestic and foreign. Indonesia is an area that is very prone to disasters, especially earthquakes and floods. We can no longer avoid this. Therefore, we must prepare well to deal with it. The role of technology in disaster management (Krishna & Mukherjee, 2022) includes:

1. Catalyst for disaster preparedness, response, recovery, and mitigation processes.
2. Providing access to vital preparedness information to the public.
3. Decision Support Systems (DSS) based on Geographic Information Systems (GIS) are handy tools in disaster planning and management, including in the stages of mitigation, emergency response operations, and post-disaster recovery.
4. Emergency communications for emergency response and timely distribution of aid.
5. Build a collection/database of knowledge (Knowledge Warehouses) to support the process of policy formulation and planning.

The use of appropriate technology is essential in efforts to reduce disaster risks more effectively. Utilisation of the internet in the geographic field is used as a means of sharing information to find out the location of a country, city, or region. The dissemination of geographic information can be in the form of spatial (regional) data or non-spatial data in the form of information related to the region's existence. GIS is one information technology that can reduce disaster risk (Rezvani et al., 2023). In addition to using GIS to

reduce disaster risk, there is also a decision support system, namely the Decision Support System (DSS), which has a vital role in disaster risk reduction efforts and is used to assist decision-makers, such as authorities and related organisations, in managing disaster response more effectively. A Decision Support System or DSS is an information system with a computerised basis. The system is part of the knowledge management system and supports decision-making activities in a company or organisation. DSS can also be interpreted as a helpful system for supporting the process of analysing data, modelling a decision, orienting towards planning in the future, and oriented towards a decision. The DSS uses stages in decision-making by distinguishing between problem structure and security level. A computer system also processes data into information to decide on structured, unstructured, and semi-structured problems (Mufana & Ibrahim, 2022). The existence of this DSS can help companies solve problems or communicate structured and unstructured constraints. The main goal of a DSS is to support decision-makers in making better decisions and provide various forms of information and guidance that enable users to make more effective decisions.

The Internet, Geographic Information Systems (GIS), remote sensing, and satellite-based communication systems are information and communication technologies that have significantly impacted disaster risk reduction. These technologies have been crucial in developing early warning systems accelerating preparation, reaction, and mitigation processes. Building knowledge warehouses using the internet and data warehousing methods is another everyday use for ICT tools. This knowledge repository can facilitate planning and policy decision-making for all preparedness, response, recovery, and mitigation levels. Similarly, GIS-based systems support development planning, enhance the quality of hazard vulnerability analysis and capacity assessment, and help planners choose mitigation strategies. Communication systems are now required for emergency communications and quick relief and response actions. This technology may be drones, GIS, or the Internet of Things.

## 10.5. Post-Disaster Recovery and Rehabilitation

### 10.5.1 Utilising technology for post-disaster assessment and recovery

Technology can be helpful in the post-disaster assessment and recovery process by providing crucial data and information that can aid in determining the extent of damage and formulating the best course of action (Kabra et al., 2017). For instance, drones can conduct in-depth surveys of affected areas, and satellite imagery can be used to identify damaged areas. Unmanned aerial vehicles can also assess damage, find victims, and deliver emergency medical supplies (Coleman et al., 2009). Similarly, GPS information can be used to monitor development and guarantee efficient resource use. Therefore, any project for post-disaster recovery must invest in technology to succeed.

The various forms of local wisdom that take the form of environment-adaptive behaviour play a significant role in efforts to lower the risk of disaster (Triastari et al., 2021). Applying original knowledge in the community helps people prepare for and respond to impending disasters. The community's indigenous knowledge is derived from various lessons learned by their ancestors while engaging in disaster preparedness techniques. Local wisdom-based education is an educational approach that integrates values, culture, traditions, and the local potential of an area's community into the curriculum and learning process, which will have several benefits and high relevance to life skills, mainly when relying on the local potential of each region. Disaster mitigation is

one example of education that closely relates to disaster risk reduction skills through local wisdom. Because a society that can withstand disasters respects and comprehends the natural world. Education empowers and prepares young people to contribute positively to their communities, countries, and states. As a result, each community must be aware of the local characteristics and requirements. Geographically, disasters differ in patterns and characteristics, necessitating different handling strategies. It demonstrates local wisdom's inherent ability to promote local wisdom's value in a community.

Climate change is currently causing numerous natural disasters and hazards in many cities. EnvironCommunities are more acutely vulnerable due to environmental risk, which worsens the effects of hazards and makes recovery more complex. Community resilience can reduce people's vulnerability and increase their capacity to cope with and adapt to environmental hazards. On the other hand, community resilience lessens people's susceptibility to environmental hazards and improves their ability to handle and adapt to them (Powell & Leytham, 2014). Communities with a stronger sense of place are more resilient than others. Therefore, improved place identities can help communities recover and adapt more effectively during gradual or unexpected environmental disturbances. The contribution of place identity to a community's capacity for adaptation can inform policymakers' efforts to improve community resilience. In particular, in areas with lower levels of place identity, policymakers should support creating and developing place identities by implementing policies that revitalise rivers, develop green spaces, and host social events.

### 10.5.2 Developing metrics for assessing disaster preparedness.

The degree to which a community or community is prepared for disasters influences the resilience index of the city. Communities in disaster zones will experience an event firsthand if it occurs there. As a result, they are the first to experience a disaster and frequently the last to recover from it. They are expected to actively participate in efforts to reduce the risk of disasters because they are the main actors. Being ready to respond to disasters will increase their resilience and reduce their vulnerability. It is necessary to assess the concrete steps people have taken to ensure that they and their families can survive during and after a disaster to determine whether people living in vulnerable areas are well-prepared to handle future disasters (Kurnio et al., 2021). Preparation can be viewed from the following perspective outline in Table 10.5.

**Table 10.5** Preparedness Dimensions and Activities

| **Dimensions of Preparedness** | **Associated Activities** |
|---|---|
| Hazard Knowledge | Conducting assessments of risks, effects, and vulnerabilities; utilising scenarios, census data, and loss estimation software; recognising potential effects on buildings, structures, infrastructure, and people; providing various stakeholders with hazard information. |
| Management, Direction and Coordination | Defining roles and responsibilities related to response; creating a work breakdown structure and shared understanding of these roles and responsibilities; creating networks and committees for preparedness; implementing necessary and advised management practices (such as the National Incident |

| Dimensions of Preparedness | Associated Activities |
|---|---|
| | Management System); training experiences, conducting drills, educating the public. |
| Formal and Informal Response Plans and Agreements | Developing emergency plans, evacuation strategies, memoranda of understanding, agreements on mutual aid, cooperative partnerships, and resource sharing; participating in larger-scale and more general planning initiatives (such as industry-wide preparedness programs, regional Urban Area Security Initiative plans, neighbourhood and community preparedness groups). |
| Supportive Resources | Acquiring supplies and equipment to support response efforts, ensuring resilience, hiring personnel, finding previously untapped resources, and developing logistics capabilities. |
| Life Safety Protection | Preparing family members, workers, and others to act immediately to prevent death and injury, such as by evacuating, sheltering in place, making use of "safe spaces" within structures, or taking emergency measures to lessen the effects of disaster on health and safety; preventing secondary threats, such as fire after earthquakes. |
| Property Protection | Taking prompt action to stop property loss or damage; safeguarding inventory and vital records; ensuring that essential operations can continue in the event of a disaster; containing supplementary dangers. |
| Emergency Coping and Restoration of Key Functions | Enhancing one's ability to improvise and innovate, improving one's capacity for disaster self-sufficiency, and ensuring one's ability to carry out emergency restoration and early recovery measures. |
| Initiation of Recovery | Creating recovery plans, laws, and other legal regulations to be implemented after disasters; obtaining sufficient insurance; finding resources for recovery assistance. |

(Source: Sutton & Tierney, 2006)

With local wisdom, traditional disaster technology engineering will be produced. For instance, the Indonesian people's traditional engineering technologies in disasters include housing infrastructure, land management and use, and hazard warning systems (Kurnio et al., 2021). Even though they go by different names or terms, technological disaster mitigation trends can be similar. The belief in harmonious coexistence between humans and nature as 'God's creation' is a robust ethical and philosophical principle in several cultures and societies, and traditional engineering technology is often directed towards considering environmental sustainability, both in terms of the systems used and in the selection of material. An uncompromising attitude in the face of catastrophe can be fostered by solid belief. (Figure 10.15).

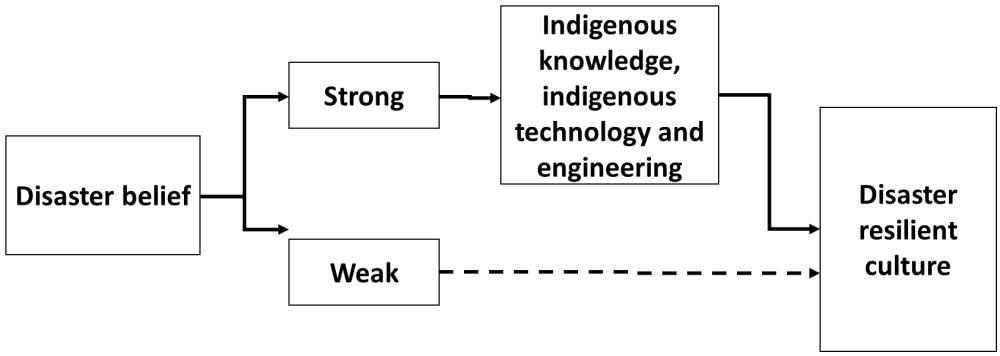



**Figure 10.15** Indigenous disaster mitigation pattern

Expertise and networks in disaster risk reduction and management are crucial to the evolution of disaster preparedness. Local and national governments lead the charge and invest in risk mitigation and adaptation. Nevertheless, there are still several significant problems that need to be addressed. There are frequently gaps in the formal mechanisms that link institutions and policies related to adaptation, development, and disaster risk reduction. The amount of funding requested is still insufficient, and these programs have not generally been fully implemented nationwide. Although some developing nations have used the current international funds for fighting climate change, there is still much uncertainty about how the significant adaptation funds projected for the future will be accessed and used. To take advantage of current opportunities for advancement and to encourage effective action for sustainable adaptation, the four key messages below should be emphasised:

1. Disaster risk reduction policies and programs can lessen the effects of climate-related hazards, directly assist climate change adaptation, and aid in reducing poverty.
2. Building strong institutional ties between disaster risk reduction and climate change adaptation requires political commitment at the highest level to keep all sectors motivated.
3. Because disasters and climate change affect every aspect of society, every civil society sector, including the private sector, must be involved in disaster risk reduction and adaptation strategies.

## 10.6 Case Studies of Successful Community Preparedness

Disaster risk management is essential in efforts to achieve sustainable development, which aims to reduce the adverse effects of natural disasters or other incidents through a series of activities that include disaster prevention, mitigation, and preparedness. Community-based disaster risk management is the primary approach in initiatives to increase resilience to disasters, where this approach views communities as critical actors in understanding, reducing, and overcoming the disaster risks they face. It aims to establish the extent to which village resilience assessment is crucial, and what exactly is the process for conducting a village resilience assessment to support the development of a disaster-resistant village.

Aik Berik Village's natural surroundings are dominated by forests, one of which is known as Community Forest and is often abbreviated as HKm. It is because Aik Berik Village is situated on the slopes of one side of Mount Rinjani. The community is determined to improve and restore the forest ecosystem due to their concern for the

fragile state of the protected forest in Aik Berik Village. Several communities have started reforestation programs to realise this hope by providing fruit-bearing tree species and vegetation conservation. After that, a group of forest farmers was established to manage and develop a tour which has since improved the welfare of those living around Aik Berik Village. However, the disaster also has a chance to lurk behind the tourist village's potential. As owners of HKm area management rights, the Association of Farmers Groups (Gapoktan) Rimba Lestari and the Environmental Awareness Group (Pokdarling) Umar Maye implement sustainable forest management practices. This principle is essentially a result of the fact that locals are highly conscious of the significance of maintaining natural balance to satisfy their survival needs, which have a right to be protected and preserved. So, each new tourism venture in Aik Berik Village is founded on careful planning considering the potential environmental effects. The community-based disaster mitigation model practised by the residents of Aik Berik Village requires additional instruments, such as appropriate laws and regulations as a legalistic basis, government support through BPBD to provide socialisation and community skills, especially tourism object managers in the form of disaster preparedness, and support from parties who have a connection to the management efforts of Aik Berik HKm which pay attention to the principles of disaster preparedness (Rahman et al., 2022).

Several studies have examined the emergence of thoroughly organised grassroots group disaster responses in Yogyakarta in an exploratory case study that focuses on the 2010 eruption of Mount Merapi in Central Java, Indonesia. Researchers are developing the idea of information capital by examining how grassroots organisations can mobilise resources for disaster mitigation, where social capital based on community response plays a crucial role in disaster recovery. Additionally, the interaction between people made possible by information technology significantly improves social capital mobilisation. The function of Jalin Merapi, a web-based organisation established to address crises following a volcanic eruption, clearly illustrates this reciprocal interaction (Tasic & Amir, 2016). Communities residing at Merapi's base exhibited exceptional resiliency after the 2010 eruption. Part of a community's ability to withstand disasters is built on its robust information.

Today's modern, distinctive information capital differs from the conventional strategy based on the spiritual tradition of the Merapi volcano. More specifically, traditional information capital, aside from the advantages gained, has a low-risk potential, a subjective sense of security, and a deluded notion that calamity can be avoided through religious activity (Dove, 2008; Schlehe, 1996).

In contrast, the Nahdliyin Jama'ah Community's distinctive activities illustrate how information capital can be considered a substantial social capital bolstered by the intense nature of information. It is how information capital connects impacted communities with outside resources for effective disaster response and recovery, such as information and humanitarian aid.

## 10.7 Conclusion

Natural disasters are good things that happen to people because they provide salvation. Disaster management includes a series of efforts designed to reduce risks, mitigate impacts, and respond to disasters, including actions taken before, during, and after a disaster. Disaster recovery that can move forward quickly and aid mobilisation can be effective. As a result, the advantages of preparation are crucial when dealing with disasters.

There are three actions that a person can take to increase disaster preparedness; disaster management planning, resource maintenance, and individual training. An essential component of disaster management is preparedness. Communities must be prepared for disasters as part of disaster management. Therefore, creating a disaster management plan is crucial. Through this planning, the community can learn the steps to prepare for potential disasters.

The threats, weaknesses, and disaster risks in each region must be considered when modifying this disaster management plan. Understandably, the government would try to increase community ownership of preparedness and recovery, given the rising number of natural disasters and their financial burden on society. Even though this fact has been widely and increasingly recognised, society still faces challenges. Each year, the cost of better planning and recovery increases. Thus, rather than waiting until the plan is finished, it is crucial to consider implementing specific disaster risk reduction measures early in the planning process.

Priority should be given to actions that can and will quickly produce tangible results for which local resources and capacity are readily available. It will inspire all interested parties and disaster risk reduction in cities will become more critical.

# References


Coleman, D. J., Georgiadou, Y., & Labonte, J. (2009). Volunteered Geographic Information: The Nature and Motivation of Produsers *. *International Journal of Spatial Data Infrastructures Research*, *4*, 332–358. https://doi.org/10.2902/1725-0463.2009.04.art16

Decisions, R. C. U. (2007). *IDEP*.

Dove MR. (2008). Perception of volcanic eruption as agent of change on Merapi volcano, Central Java. *Perception of Volcanic Eruption as Agent of Change on Merapi Volcano, Central Java*, *172*(3–4).

Kabra, G., Ramesh, A., Akhtar, P., & Dash, M. K. (2017). Understanding behavioural intention to use information technology: Insights from humanitarian practitioners. *Telematics and Informatics*, *34*(7), 1250–1261. https://doi.org/https://doi.org/10.1016/j.tele.2017.05.010

Karopeboka, B. (2014). Peran Iptek Dalam Sistem Mitigasi Bencana Longsor. *Jurnal Teknik Sipil KALIBRASI Vol.2*, *2*(1), 41–62.

Krishna, A. P., & Mukherjee, A. B. (2022). Satellite and aerial remote sensing in disaster management: An introduction. In *Nanotechnology-Based Smart Remote Sensing Networks for Disaster Prevention* (pp. 273–280). Elsevier.

Kurnio, H., Fekete, A., Naz, F., Norf, C., & Jüpner, R. (2021). Resilience learning and indigenous knowledge of earthquake risk in Indonesia. *International Journal of Disaster Risk Reduction*, *62*, 102423. https://doi.org/https://doi.org/10.1016/j.ijdrr.2021.102423

Miftah, M. (2023). Social Changes for the Indigenous People of Kampung Naga. *Resmilitaris*, *13*(1), 475–483.

Mitchell, J. K., O'Neill, K., McDermott, M., & Leckner, M. (2016). Towards a transformative role for local knowledge in post-disaster recovery: Prospects for co-production in the wake of Hurricane Sandy. *Journal of Extreme Events*, *3*(01), 1650003.

Mufana, M. W., & Ibrahim, A. (2022). Implementation of smart grid decision support systems. *IDOSR Journal of Scientific Research*, *7*(1), 50–57.

Powell, T., & Leytham, S. (2014). Building Resilience after a Natural Disaster: An Evaluation of a Parental Psycho-educational Curriculum. *Australian Social Work*, *67*(2), 285–296. https://doi.org/10.1080/0312407X.2014.902981

Putra, S. E., Dewata, I., Barlian, E., Syah, N., Fatimah, S., Iswandi, U., & Sholichin, M. (2023). *Peran Kearifan Lokal Masyarakat Suku Mentawai dalam Upaya Mitigasi Bencana : Sistematik Review*. *10*, 88–96. https://doi.org/10.31258/dli.10.2.p.

Rahman, A., Ardhiansah, N. F., Pasaribu, H. A., & Saputra, M. R. (2022). Model Mitigasi Bencana Desa Wisata Aik Berik Kecamatan Batukeliang Utara Kabupaten Lombok Tengah. *Jurnal Ilmiah Administrasi Pemerintahan Daerah*, *14*(2), 180–197. https://doi.org/10.33701/jiapd.v14i2

Rezvani, S. M. H. S., Falcão, M. J., Komljenovic, D., & de Almeida, N. M. (2023). A Systematic Literature Review on Urban Resilience Enabled with Asset and Disaster Risk Management Approaches and GIS-Based Decision Support Tools. *Applied Sciences*, *13*(4), 2223.

Saiman, S., Hijri, Y. S., & Hadi, K. (2022). Pendampingan dan Pelatihan Peningkatan Kapasitas Desa Tangguh Bencana Sebagai Upaya Pengurangan Risiko Bencana (PRB) Berbasis Masyarakat Di Desa Gajahrejo Kecamatan Gedangan Kabupaten Malang. *Society: Jurnal Pengabdian Masyarakat*, *1*(2), 65–73.

Santoso, M. B., Buchari, A., & Darmawan, I. (2018). Mekanisme Masyarakat Lokal dalam Mengenali Bencana di Kabupaten Garut. *Share: Social Work Journal*, *8*(2), 142–149.

Schlehe J. (1996). Reinterpretations of mystical traditions: explanations of a volcanic eruption in Java. *Anthropos*, *91*(4–6), 391–409.

Sutton, J., & Tierney, K. (2006). *Disaster Preparedness: Concepts, Guidance, and Research*. Natural Hazards Center, Institute of Behavioral Science, University of Colorado.

Tasic J., & Amir S. (2016). Informational capital and disaster resilience: the case of Jalin Merapi. *Disaster Prev Manag*, *25*(3), 395–411.

Triastari, I., Dwiningrum, S. I. A., & Rahmia, S. H. (2021). Developing Disaster Mitigation Education with Local Wisdom: Exemplified in Indonesia Schools. *IOP Conference Series: Earth and Environmental Science*, *884*(1). https://doi.org/10.1088/1755-1315/884/1/012004

# CHAPTER 11: SUSTAINABILITY THROUGH AGRICULTURAL EXTENSION SERVICES

***Authors: Enock Siankwilimba, Jacqueline Hiddlestone-Mumford, Bernard Mudenda Hang'ombe, Chisoni Mumba, Gunawan Prayitno, Ismu Rini Dwi Ari, and Janine LeaBarrett***

## Abstract

Agriculture has an important role in supporting environmental and economic sustainability. Agricultural services, such as those provided by farmers and agricultural practitioners, can contribute significantly to creating sustainable agricultural systems. Agricultural services are a variety of services, work or activities related to the agricultural sector, which include various aspects of production, management, and marketing of agricultural products. Sustainable agricultural extension services are a form of agricultural support service provided by agricultural extension workers or agricultural practitioners who have knowledge and skills in sustainable agricultural practices. Sustainable agricultural extension services are an effort to provide information, education and guidance to farmers, agricultural entrepreneurs, and rural communities in general so that they can adopt more sustainable agricultural practices. With sustainable practices, farmers and agricultural practitioners can support environmental, economic, and social sustainability in their region. This chapter will discuss seven sections, which include introduction; extension and the challenges of increasing food production; sustainability of supply and demand for extension services; group mobilisation extension skills; active listening extension skills; one stop shop skill sets to unlock traditional norms and cultural conflicts;, and learning and trainers' skills.

**Keywords:** agricultural services, extension services, sustainable agriculture

## 11.1 Introduction

Current research highlights a discernible gap between the supply of agricultural extension services and the actual demand for these services. This divergence is evident in the differing approaches taken by governments, corporate entities such as the FAO, the World Bank, and agro-based businesses in providing extension services to farmers. These entities' provision of services differs from the needs articulated by farmers, which vary based on factors such as value chains, geographical contexts, and gender considerations. It posits that a singular, universally applicable method of extension is insufficient, underscoring the need for multiple models tailored to accommodate diverse farmer requirements. However, the supply of extension products and services by governments leans towards public goods or necessities, thereby hindering the fulfilment of specific farmer needs. This debate on public goods underscores that such offerings are intended for the general populace, which is typically unwilling to remunerate for these services.

Given these complex scenarios, the factors that render agricultural extension delivery services unsustainable from both the supply and demand perspectives remain unclear. Consequently, the primary objective of this study is to comprehensively assess the main deficiencies in the delivery services provided by most extension workers. The

*Enock Siankwilimba, Jacqueline Hiddlestone-Mumford, Bernard Mudenda Hang'ombe, Chisoni Mumba, Gunawan Prayitno, Ismu Rini Dwi Ari, and Janine LeaBarrett *email: enocksiankwilimba@gmail.com*

https://doi.org/10.11594/futscipress37

study aims to deliberate on the requisite facilitation skills essential for successfully conveying extension services to end users at the grassroots level. To achieve this objective, the study reviewed numerous past and contemporary studies from diverse sources, including Google Scholar, Scopus, Web of Science, Research Gate, and globally recognised authenticated websites, as well as active participation in extension service delivery. This rigorous inquiry endeavours to elucidate the multifaceted dynamics that define the landscape of agricultural extension services globally.

## 11.2 Extension and Challenges of Increasing Food Production

A recent study by Nature Editorials (2019) has shed light on the global food system, revealing its substantial market value of US$10 trillion. However, this seemingly prosperous system carries hidden costs amounting to US$12 trillion. When weighed against these costs, the required investment appears modest. This report suggests that by 2030, the potential reward could reach US$5.7 trillion annually. To capture this reward, new investments ranging from US$300 billion to US$350 billion annually are projected, yielding a remarkable return ratio of over 15:1 (Gladek et al., 2017). This endeavor necessitates the adoption of innovation and technology through efficient agricultural extension delivery services. Despite the optimistic valuation of the food market, the report posits a cautionary note. If no corrective measures are taken to transform the production and consumption patterns, costs could escalate to over US$16 trillion annually by 2050 (Giller et al., 2021a; Sutton et al., 2016). Higgins (2015) highlights that merely 16% of the global population accounted for an astonishing 78% of consumption, employing 50% more nonrenewable resources than three decades ago.

Efforts to meet these demands necessitate an increase in productivity, particularly concerning conception, calving, and weaning rates, and yield per animal (Goedde et al., 2020). However, predicting and planning for the complex interactions involving potential population levels, environmental factors, resource availability, economic landscapes, and healthcare requires consideration of the diverse facets of societies (Giller et al., 2021b; Vollset et al., 2020). Considerations around the development and implementation of appropriate strategies are needed (Amoo et al., 2019; Amoo & Hiddlestone-Mumford, 2017; Bellamy et al., 2019), including the most appropriate engagement with and timing of extension services.

The analysis of farm sizes and farmland distribution globally, as demonstrated by Lowder et al. (2016), reveals that while more than 570 million farms exist worldwide Lowder (2016), most are small, family-operated ventures who depend on the mentorship of seasoned extension workers whose skills have to be up to date (Chambers, 1995). Globally, small farms, comprising less than 2 hectares, manage about 12% of agricultural land, with family farms operating approximately 75% (Lowder et al., 2016). These farms have been cited as being sparsely located and populated, making them very difficult to service in a structured extension system both presently and in the past (Chambers, 1997; Siankwilimba, 2019). Farm size trends exhibit variations between low-income and lower-middle-income countries, where average farm sizes have decreased, and upper-middle-income and high-income countries, where they have increased (Vollset et al., 2020). To enhance agriculture, continual efforts are required to improve the collection, distribution, and standardisation of agricultural census data, and extension workers play crucial roles in achieving these outcomes.

## 11.3 Sustainability of Supply and Demand of Extension Services

Over the years, numerous scholars have engaged in discussions regarding the source of extension services, with consensus emerging that governments and the private sector have significant roles in their provision (Siankwilimba et al., 2021; 2022; 2023b; Prayitno et al., 2023). Simultaneously, arguments have arisen, highlighting the presence of multiple extension players beyond the public and private sectors in the market systems. Notably, Maulu and colleagues (2021) emphasise the involvement of entities such as the World Bank and FAO (Food and Agriculture Organisation) in supplying extension services to farmers in both developed and developing nations. Expanding this spectrum, it becomes evident that farmers' associations, cooperatives, and even multinational corporations engaged in agricultural activities also participate in extending these services to growers (Gautam, 2000; Lamboll et al., 2021; Mikhailov et al., 2021; Norton & Alwang, 2020).

Although these endeavours are geared toward enhancing the livelihoods of rural communities, it has been observed that the channels and individuals responsible for delivering these extension systems often lack the requisite engagement skills tailored to the local context of farmers (Elahi et al., 2021; Maulu et al., 2021). Recent research indicate that many extension workers tasked with imparting technical and market information to smallholder farmers rely on outdated and overly technical content that fails to align with the educational and cultural background of rural farming communities (Mumba et al., 2023). This mismatch hinders the effective assimilation and dissemination of information (Chakraborty et al., 2019; Msuya et al., 2017; Pound & Conroy, 2017). In response, academic institutions have endeavoured to revamp their curricula to better align with the needs of farmers, the corporate world, and the specific geographic contexts in which they operate (Khanna et al., 2021; Mumba et al., 2023; Yohane et al., 2022) such as the ones shown in Figure 11.16.

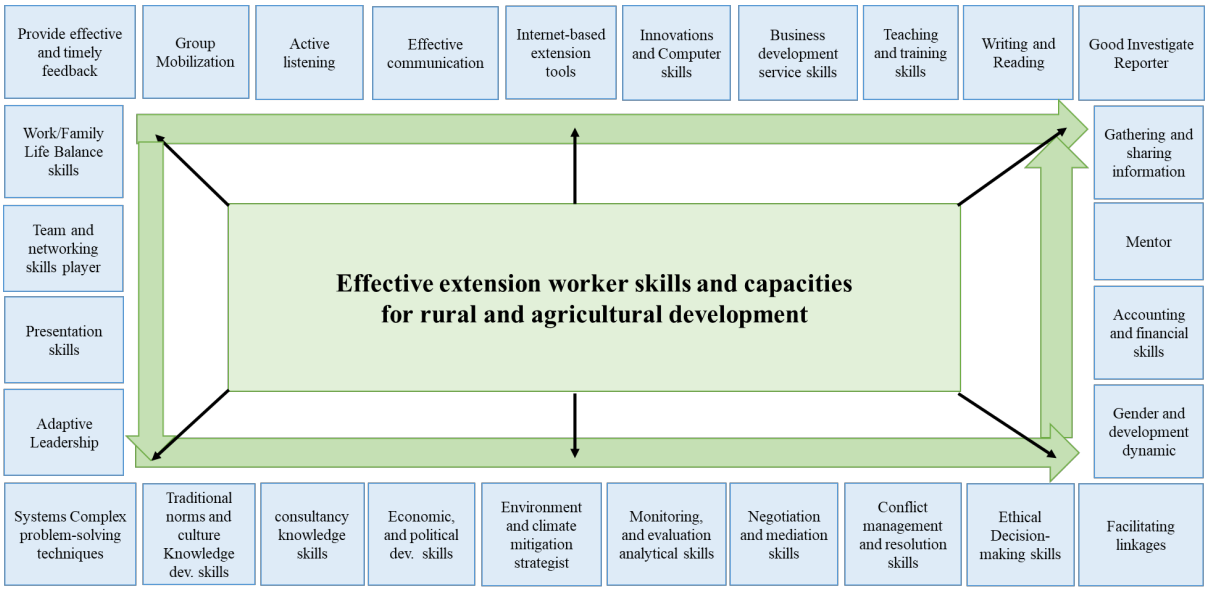



**Figure 11.16** Extension work capabilities and skills set in the agricultural ecosystems (adapted from Chamber, 1989)

Niles et al. (2020) identified that over two billion people still face access barriers to sufficient and healthy food despite technological and agricultural extension service delivery breakthroughs. This problem crosses national lines and is a concern for both developing and wealthy countries. This pervasive issue has received attention, but studies show that extension remains the critical answer (Chesterman et al., 2019). The agricultural extension reform of the food production system is essential to meeting the major global problem of feeding the expanding population sustainably and healthily. In many areas, including the environment, economy, human welfare and health, training and access to affordable resources, the food system and agricultural extension system, and skill development, are intertwined. Therefore, extension workers skills sets and capabilities are critical, as shown and summarised in Figure 11.16.

## 11.4 Group Mobilisation Extension Skills

The capacity and willingness to organise farmers into entities such as cooperatives or associations stands as a pivotal skill required of an extension worker. This skill streamlines the communication of information from them to the farmers and various other stakeholders. Mobilising groups demands a comprehensive understanding of the farming community's allegiance to its leadership structure. Given the community's reliance on leadership, the inclination of many farmers to engage with the organisation hinges on the chosen leader. Numerous scholars advocate for a transparent and democratic approach to selecting group leaders, involving collaboration between the extension worker and local leadership (Siankwilimba et al., 2021; 2023a; 2023b). This encompasses the responsibility of not only aiding in the establishment of selection criteria but also enabling farmers to choose their leaders within the framework.

Frequently, leadership formed by the farmers themselves garners recognition and adherence, serving as a conduit for convening meetings and disseminating pertinent agricultural information. Aligning with these notions, Chambers (1994) introduced the community participatory approach, empowering individuals at the grassroots level to engage in their developmental journey. He contended that many development projects treated local farmers as passive recipients, unable to shape their own path, a perspective leading to the failure of numerous initiatives in developing nations. Hence, the development of group facilitation skills becomes imperative for every extension worker to ensure the sustainability of agricultural development across all stakeholders within the rural community. As shown in the photo taken by the authors during field training, Figure 11.17 shows the group mobilisation of farmers towards cassava crop training and engaging traditional leadership via participation in their traditional ceremony.



**Figure 11.17** Group mobilisation starts with engaging and recognising the local leadership and the traditions and culture (photos source: authors)

## 11.5 Active Listening Extension Skills

Another approach employed by certain trainers involves Socratic Dialogue, which proves advantageous in engaging farmers to assimilate conveyed information (Morrell, 2004). Socratic Dialogue, highlighted by Knezic et al. (2010), aligns with the evolving emphasis on interpersonal skills and experiential learning in educator training. Notably, the Nelson and Heckmann tradition of Socratic Dialogue, according to Stavru and Moore (2017) and Smith (2011), facilitates both learner and teacher engagement in experiential-based learning. Studies emphasise that Socratic Dialogue fosters dialogic abilities integral to social competence, providing a platform for mutual learning and collaborative knowledge construction (Stavru & Moore, 2017).

In light of these insights, engaging in Socratic Dialogue prompts participants to scrutinise their teaching beliefs, potentially leading student teachers to adopt fresh concepts and adjust their instructional methodologies (Kahn, 1981). Figure 11.18 offers a comprehensive overview of Socratic Dialogue as applied in extension delivery in the field.

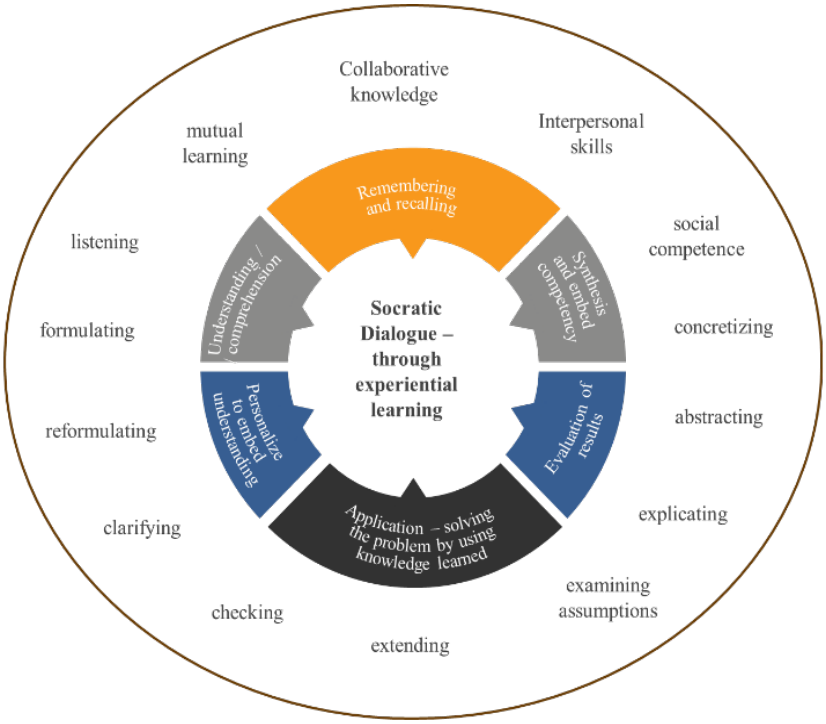



**Figure 11.18** Socratic Dialogue in action as applied in extension delivery in the field. (Data source: Stavru & Moore, 2017)

Bodie et al. (2015) conducted a study to assess the role of listening actively in informal helping conversations using different variables. Bodie et al.'s (2015) results show that active listeners were taught to be direct with their nonverbal cues, conduct assumption checking, reflect feelings, use open inquiries, and paraphrase content. However, judgments of relational assurance or the usefulness of problem-solving were unaffected by verbal and nonverbal active listening practices, which were assessed as signifying higher emotional awareness and fostering a larger degree of emotional improvement. According to Bodie et al.'s (2015) study, in comparison to the nonverbal behaviours, the set of verbal behaviours was generally more significant in the prediction of outcomes. In real life both verbal and non-verbal body language is critical to assess active listening during training and the extension worker need to possess such competencies and skills to leave no one behind in training and subsequent farming business. Figure 11.19 shows the signs of trainers and trainees engaging each other during the training, fostering active listening and effective communication while using a white board.



**Figure 11.19** Trainers and trainees engagement portraying active listening and effective communication (photos source: authors)

Figure 11.20 shows different players and the flow of extension products and services, coupled with competency and capacity skills in agricultural ecosystems. Figure 11.20 further indicates that there is interconnection between different players in extension services and their different skills and capacities reaching the farmers downstream.

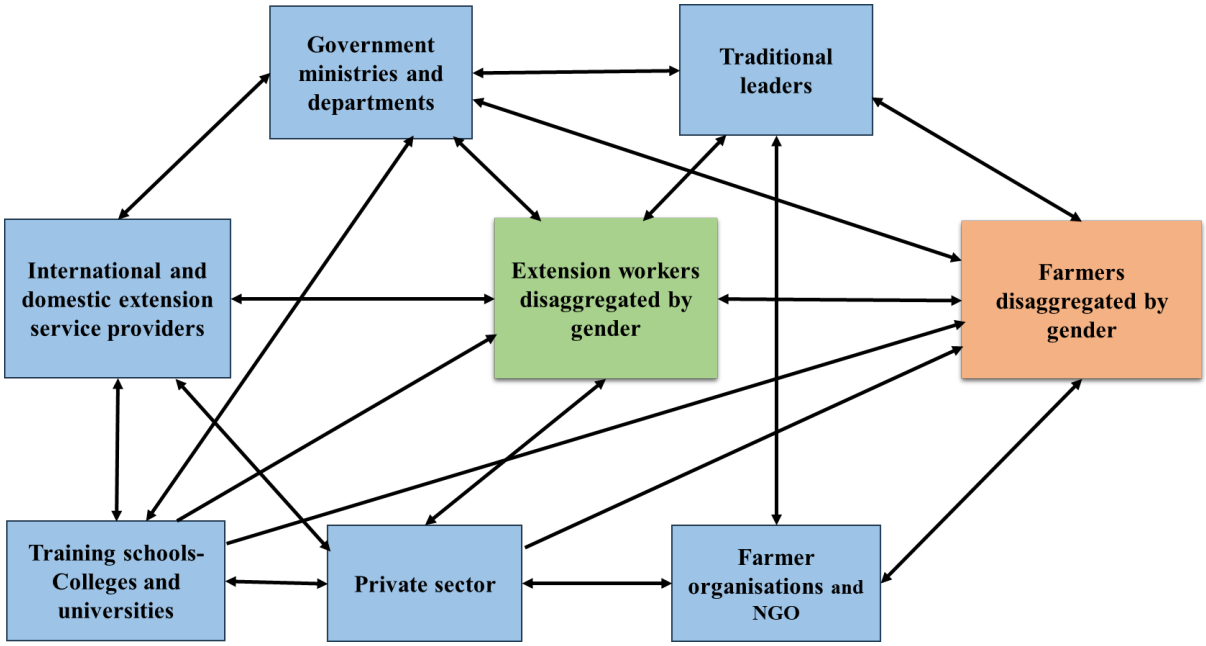



**Figure 11.20** Different extension stakeholders and flow of competency and capacity skills in the agricultural extension bioecosystems (adapted from Siankwilimba et al., 2023b)

The "what, why, where, who, and how" question techniques used helps the farmers discover themselves, as shown in Table 6**.** Since the role plays are intended to be experiential exercises, their design makes the assumption that the participants have the

necessary information to solve problems, make decisions, and interact with one another. This presumption guides participants in utilising the experiential reflection model to evaluate team and individual performance as well as leadership behaviours. Participants acquire new information during and after the role play process. The role play can be situated either physically or virtually by the extension worker depending on the resources at their disposal.

**Table 11.6** Different question techniques for processing role play and their example answers matrix

| **Question** | **Possible answers** |
|---|---|
| What did you see in the play? | Different characters performing different roles in the play |
| What did you hear? | Different characters with different problems |
| What is the major problem? | Low yields due to low production |
| Why is there a problem? | Using traditional outdate methods |
| What is the solution? | When faced with this problem, seek advice from extension worker and learn new improved technology at field days |
| How is the problem solved? | By attending training and field days |
| From the role play, are these things happening in our society? | Different participants are likely to indicate what happens in their community set up and at an individual level |
| Where have you seen them happening? | It happened with me or with my neighbour |
| If they are happening how did or how are you solving them? | Experiential learning comes into play |
| How do we help those that are faced with such problems in their farming community? | Encouraging them to attend meetings, training, or field days |

Adapted from DeNeve and Heppner (1997), and Ziervogel (2004).

Studies conducted by Iowa Learning Farms (Lowa Learning Farm, 2014; 2016) highlight how field days can be employed to evaluate the successful adoption of new technologies by farmers, as well as the efficacy of service providers in delivering goods and services within the extension ecosystem. Comito, Case Haub and Stevenson (Comito et al., 2017) posit that field days provide farmers with the opportunity to engage with peers who have already embraced conservation farming techniques and to receive updates from specialists about recent research in this domain. Further research indicates that attending field days enhances a farmer's likelihood of implementing conservation techniques, facilitates networking with peers, and encourages the adoption of these practices by others. The concept of the field day success loop exemplifies how these activities expand the outreach of field days to new audiences, as illustrated in Figure 11.21.

Pedro et al. (Machado et al., 2023) highlight that by sharing transaction costs and their updates with farmers during conferences and other meetings, the adoption rates and performance indicators being monitored can be increased. The study by Pedro et al. (Machado et al., 2023) assesses the field day success feedback loop to understand the dynamics of transactions, their benefits to farmers, and their overall impact, as illustrated

in Figure 11.21. These indicators in Figure 11.21 show the significance of the farmer's role in adoption of products and services while providing feedback to each other as part of their networking.

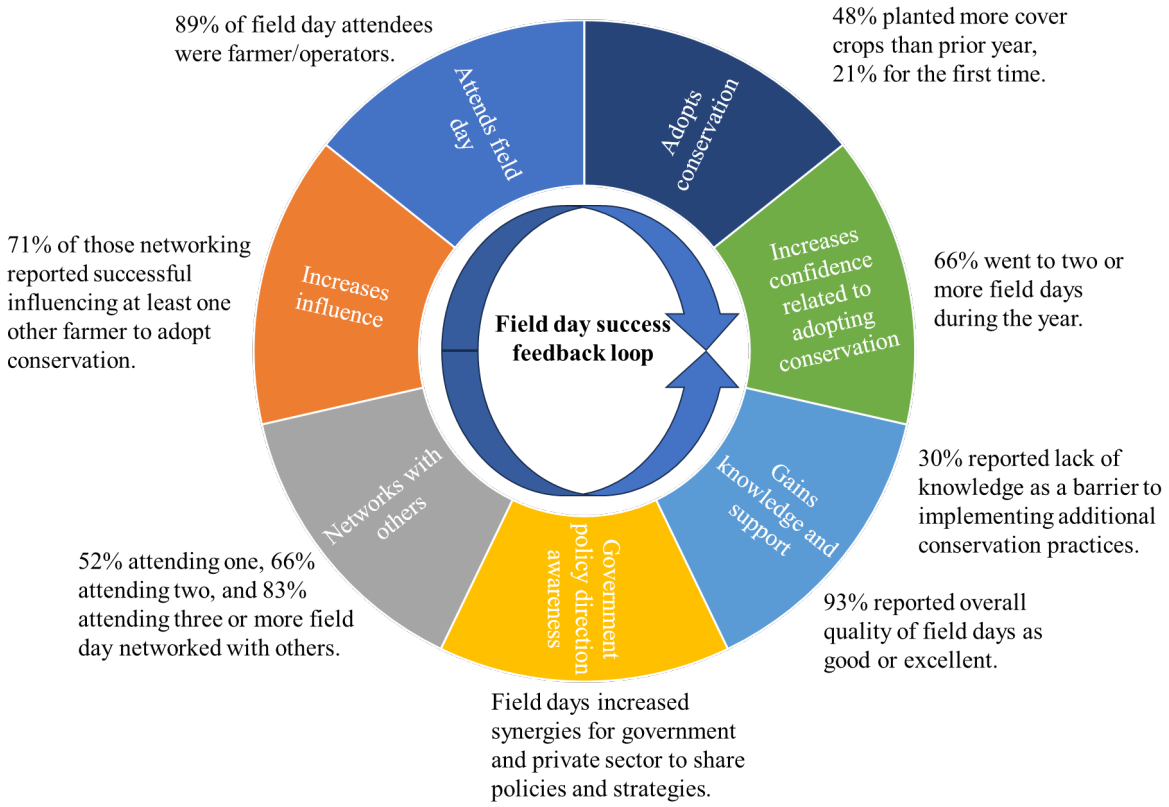



**Figure 11.21** Field Day success feedback loop (Adapted from Pedro et al., 2023)

The field day success loop encompasses the interpersonal outreach strategy of service providers, the evaluation process, and farmers' networking endeavours. This success loop framework (Figure 11.21), along with our evaluation procedure (summated in Table 11.7), is recommended for use by extension personnel to effectively monitor the efficiency and long-term impacts of farmer field days.

**Table 11.7** Evaluation of the successful adoption of new technologies by farmers

| **Farmer action related to field day success loop** | **Efficiency and long-term implication of the data findings** |
|---|---|
| Attends field day | With 89% * of field day attendees being farmers / operators, Iowa Learning Farms (ILF) is reaching direct decision makers with education on land management practices. |
| Increases influence | Farmers are extending ILF's influence to 48% more farmers than attended the event. In this way, farmers become extension "extenders" through their networking influence, with 71% * reporting success in influencing at least one other farmer to adopt conservation activities. |

| Farmer action related to field day success loop | Efficiency and long-term implication of the data findings |
|---|---|
| Networks with others | With the increase from 52% attending one, 66% attending two and 83% attending three or more field days reporting of networking with others at the field day *, the trend indicates that the more field days a farmer attends, the more likely he or she is to network with others about conservation practices. |
| Government policy direction | Field day access increased the likelihood of government and private sector sharing information on policies and strategies within the agricultural sector (Pedro et al., 2023). |
| Gains knowledge and support | The interpersonal, farmer-to-farmer presentation style of ILF field days is preferred by farmers seeking knowledge and instruction. Given that 30% report lack of knowledge as their key barrier to implementing conservation practices, when attending a field day, 93% indicate they are of good to excellent quality *. |
| Increases confidence related to adopting conservation | The more field days a farmer attends, the more likely he or she is to demonstrate confidence with regard to conservation by networking with/influencing other farmers (see "Networks with others" row). |
| Adopts conservation | Field days reach both early adopters as well as farmers who are new to conservation practices, with 48% increasing planting of cover crops compared to prior years, and of those who attended for the first time, 21% planted cover crops *. |

*Note: * relates to 2016 data.* (Adapted from Pedro et al., 2023)

One of the significant challenges still faced by many farmers in developing nations revolves around both input and output markets (Siankwilimba et al., 2023a; 2023b). Thus, it becomes imperative for extension agents to closely monitor and establish connections with buyers and sellers of the products and services essential for farmers' daily operations. Extensive research reveals that numerous markets remain elusive for smallholder farmers, including those for affordable inputs, finance, credit, business development services, digital platforms, advanced technologies, and off-take markets through contractual agreements for their produce. To navigate this complexity, the extension worker must possess the ability to connect with all stakeholders involved in supporting these products and services for smallholder farmers (Siankwilimba et al., 2023b). Sustainable extension for farms can only be attained if the farmer ecosystem allows the opportunity to share information with limited barriers. The support from other key stakeholders as strategic partners (Figure 11.22) such as private sector, government and non-government, along with multinational and multilateral players need to work to support smallholder farmers with supporting functions and policy directions to sustain them. The provision of sustainable information and technology sharing is at the epicenter of the farmer ecosystem that supports the viability of smallholder farmers, the feasibility of commercial farmers and desirability of emergent farmers, with the assistance of the strategic partners in addressing the challenges faced.

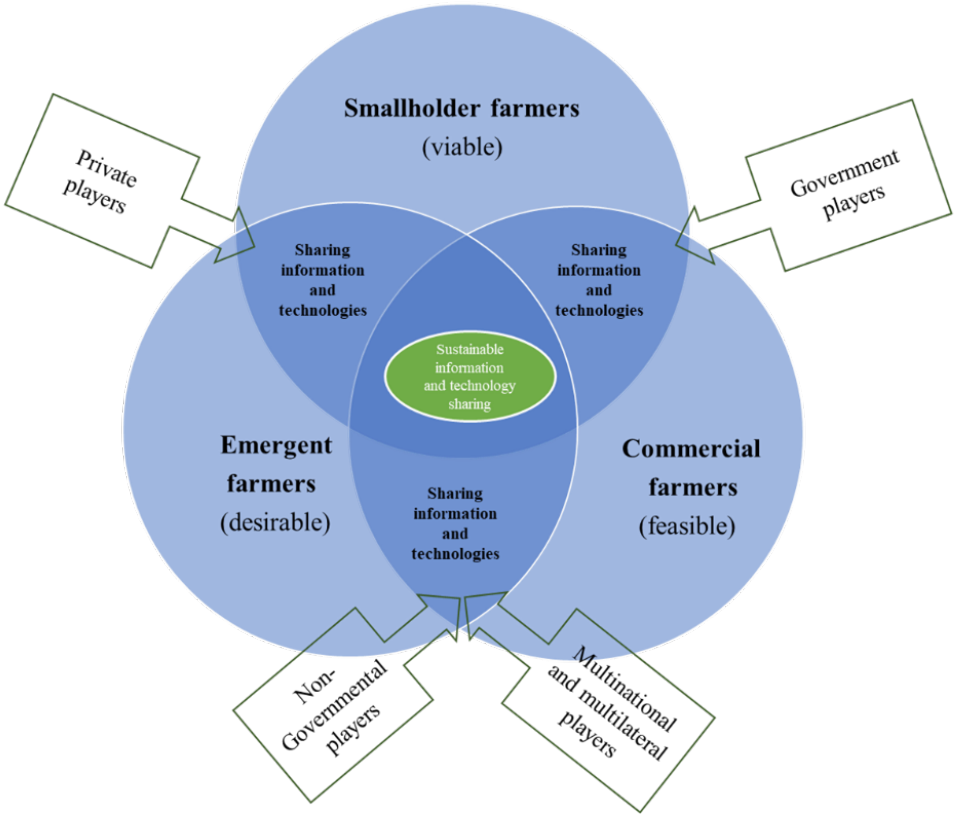



**Figure 11.22** Strategic partnership players

A recent study by Mzyece et al. (2023) employed a double hurdle model econometric analysis to shed light on this issue. The study centered on smallholder farmers in Ghana and revealed that they tend to sell more maize to aggregators than directly to consumers, largely influenced by the existing extension system. Specifically, the research demonstrated that by switching from consumer-oriented sales to aggregator channels, farmers were able to increase their maize sales by 128.46 kg conditionally and 43.41 kg unconditionally. The benefits offered by aggregators in terms of economies of scale and non-financial cost savings proved more appealing compared to direct sales. The findings indicate that, as per Mzyece et al. (2023) discovery, facilitating collaboration with aggregator-type middlemen enhances market participation.

This is of note in contexts where infrastructure and institutions are not sufficiently developed to significantly mitigate the financial and non-financial marketing costs incurred by selling directly to consumers. Consequently, effective market development necessitates the systematic engagement of both buyers and sellers, a role in which extension staff play a pivotal part by maintaining and facilitating essential linkages (Siankwilimba et al., 2023b). It is common knowledge that an extension worker has the moral acumen necessary to make ethical decisions that will support the farmers he/she works with in developing their smallholder markets in a way that protects the natural environment, along with the social and political spheres (Chambers & Conway, 1992; The Springfield Centre, 2015).

## 11.6 One Stop Shop Skill Sets to Unlock Traditional Norms and Cultural Conflicts

The key to removing the barriers posed by conventional and cultural practices that are incompatible with sustainable development is agricultural extension. Numerous studies demonstrate how cultural practices and conventions, particularly in developing nations, have been known to impede the development of smallholder farmers farmers (Todaro et al., 2020). In more recent research, the World Food Program, the World Bank, World Vision, Care International, and many other non-governmental organisations have employed extension to engage with communities who are emerging from ethnic strife and conflict in many different nations across the world. While agronomy-based instruction is the only emphasis of agricultural training schools, extension workers need to be knowledgeable about the customs and cultures of the tribes engaged in conflict. In order to promote peace and development, the abilities to negotiate, manage, and resolve such issues are more crucial. Therefore, it is crucial that laws governing sociology and rural development enable extension workers to possess the sophisticated problem-solving skills necessary for tracking and assessing the current state of development.

We consider the minimum requirements of extension teaching tools needed to provide the smallholder farmer skills sought in a variety of environments is as shown in Figure 11.23 below. The tools considered allow for remote, online and via various technology channels for extension workers to impart the knowledge and skills sought by smallholder farmers, including via the field days for both hands-on learning and networking. The ability for extension workers to integrate core competencies for smallholder farmers into every engagement builds knowledge progressively, an approach Pinto et al. (2023) took to develop field-based programs for epidemiology training for field-based veterinarians in Africa.

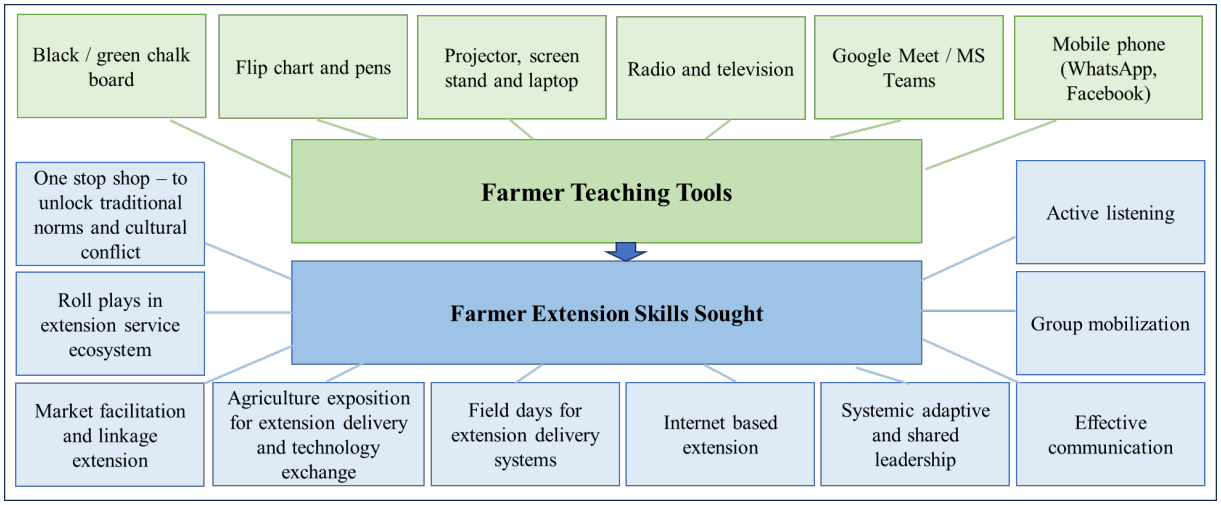



**Figure 11.23** Minimum teaching tools required, and smallholder farmer extension skills sought.

Information exchange between smallholder farmers and extension workers, and between smallholder farmers during networking increases knowledge. Li et al. (2023) studied use of information gathered from pig breeding farmers in the Hubei region of China to examine whether adoption of information technology, with a concentration on Internet use, boosts farmers' readiness to convert untreated livestock excrement into

organic fertilizer. Li et al. (2023) considered using the Internet as it improves the likelihood that pig breeding farms turns untreated manure by roughly 35–56% points toward readiness for use and application. It has been found that the inclination of pig breeding farmers to change untreated manure is also significantly influenced by characteristics such as gender, farm size, financial availability, extension contact, environmental preservation attitude, and governmental legislation and more importantly, the traditional and cultural norms. Li et al. (2023) has argued that pig breeding farmers with a greater breeding size and longer breeding years tend to have a higher impact of Internet use on farmers' readiness to turn untreated pig manure. However, a change in the farmers perception and attitudes towards policy implications that advance environmental quality, animal waste management, and the well-being and health of livestock breeding is required. In addition, extension workers that interface with farmers need to be knowledgeable enough to pass the change in policy on to the farmers, including the implications and benefits to them.

## 11.7 Learning and Trainers' Skills

A multi-skilled individual, as already noted in Figure 11.16, is an extension worker. He/she is a trainer of trainers (ToT) and a trainer of adult people (ToDP), all of whom have chosen agriculture as their primary means of subsistence despite coming from various educational backgrounds. The extension worker should be skilled in adult education because they are training adults, as opposed to those who educate children in formal education. According to some, the main difference between adult education and secondary or primary education is that, in contrast to the former, adult learners accept responsibility for their learning (Clayton, 2017). However, as adults learn best in groups, the extension worker must be skilled at leading discussions.

According to Wang et al. (2014), extension workers employ group facilitation skills (GFS) to direct the adults in a group toward a common, attainable goal. Group facilitation, according to Wang et al. (2014), is the science and art of leadership skills that include persuading a person or group to execute a particular action and plays a crucial part in achieving the transmission of knowledge to the learners. Wang et al. (2014), assert that facilitation also involves encouraging group members to actively participate, develop communication within the group, acknowledge members' opinions and feelings, and organise and reorganise the group to more readily understand difficult topics. According to Thompson and Deis (2006) an effective extension worker should be well-versed in andragogy, which focuses on instructing adults who have assumed leadership positions in their education and do so in ways that are useful to society. Because of this, evidence from studies suggests that the adult education concept requires the instructor to act more as a facilitator than as someone who conveys or provides knowledge to adult learners. Using frameworks that include six fundamental learning principles for adult learners, further studies have revealed and detailed many characteristics of adult farmer learners as reported by (Forrest III & Peterson, 2006) and as shown in Table 11.8. This table shows that high levels of engagement from trainers of extension workers are associated with greater levels of acceptance and belief in the training among adult farmers.

**Table 11.8** Farmer learning from experience: six guiding principles

| Guiding principles | Main features |
|---|---|
| Seeing is believing | In adult education, visual aids and demonstration are critical in information assimilation |
| Learners believe in knowing the benefits | Carry home benefits matters most for farmers to engage in education acquisition. Adult learners want to know how their new information may be used right away to solve a problem. |
| Self-centredness knowledge | Adult learner farmers are independent and self-directed and self-centredness who are vested with desire of freedom to decide what they want to learn, when they want to study it, and how and why. |
| Adults are not blank cassettes but filled with rich life experience | In order to add depth to class conversations and see them as valuable tools for learning from one another, the facilitator should be aware that adult learners bring a variety of life experiences to the learning environment. |
| Learning driven by motivation | Some external motivators drive adult learners to seek out learning opportunities. Internal factors including improved quality of life, self-actualisation, and self-esteem are effective motivators. |
| Ability and willingness to learn | If an adult learner needs to know something in order to deal with a circumstance in their life, then they are likely ready to learn. This is directly related to the aims and goals of learning, which are individual, institutional, and societal growth. |
| Inclination based learning | Adults must understand how learning can be applied immediately and is problem centered. Adult learners look for opportunities to learn that help them overcome challenges. |

According to Knowles et al. (2012) as shown in Figure 11.24, andragogy is a system of components that is intended to be a process model as opposed to a content model. A content model implies that the instructor or teacher's instruction or application of the material is dependent. Applying a content model to adult education implies a formal, inflexible instructional design where knowledge is learned and presented in accordance with predetermined procedures, excluding the adult learner from the process. Contrarily, andragogy, a process model that has been partially or fully embraced, enables the learner to take an active role in the learning process. One of the important elements of the andragogical model and one that this process model concept promotes is flexibility in the educator.

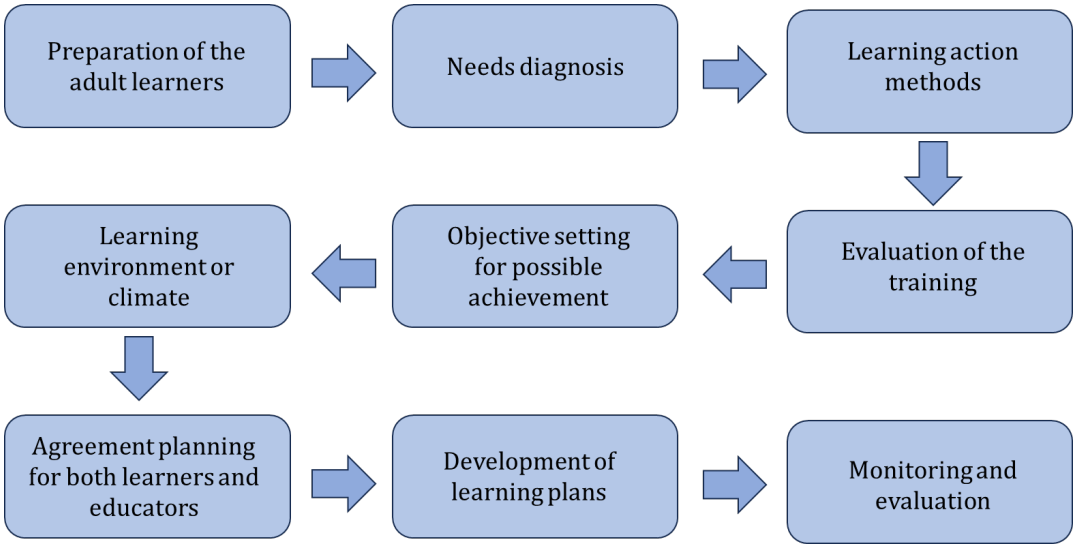



**Figure 11.24** Description and Elements of the Andragogical Process Model (adapted from Clayton, 2017; Knowles et al., 2012)

The process of co-facilitation amongst members of the group resulted in a leader-oriented approach to the dynamics of the team, which was one of the findings that stood out from the rest. The findings indicated that participants can be enabled to collaborate through social interactions when group facilitation is provided in a virtual world. According to Wang et al. (2014), this particular style of facilitating group discussions possesses many of the same features as leadership. When social facilitation or contextual learning is applied, it is abundantly evident that leadership characteristics are deployed in both the online and physical environments. Figure 11.24 is one illustration that demonstrates how many different strategies and procedures can be utilised to instruct students on learning activities and action aspects that are related to the content of a subject. Andragogy proposes that adult students learn through a variety of channels, and it urges teachers to employ a wide range of pedagogical approaches, ideas, and models in their classroom settings. Additionally, under learning environment or climate, Figure 11.24 shows that the environment that adult farmers learn in should be calm and trusting, mutually courteous, informal, and friendly, collaborative and supportive, open and genuine, and it is the role of the extension worker to work to create this kind of atmosphere with acquired skills.

# 11.8 Conclusion

This study explored the methods and strategies that extension workers need to employ in order to enhance the distribution of information systematically within the extension ecosystem. Information conveyance by extension workers to smallholder farmers is influenced by a range of attitudes and abilities. The findings reveal that effective communication skills, utilising diverse tools such as role-playing and Socratic Dialogue techniques, along with communication skills grounded in group dynamics, business development services, and related competencies, play a pivotal role in boosting farmers' engagement and adoption of extension messages. This heightened engagement subsequently leads to increased agricultural production and productivity. Additionally, enhanced market connections and the implementation of systemic adaptive leadership are identified as crucial factors in dismantling entrenched cultural and traditional

barriers that have historically hindered the acceptance of extension messaging within the conventional agricultural context.

Moreover, the study highlights the positive impact of field days, which significantly enhance experiential learning for both farmers and extension service providers alike. For farmers to thrive, it is imperative that they gain access to financial and credit facilities, markets facilitating the exchange of agricultural inputs and outputs, and innovative extension delivery mechanisms that can effectively navigate the challenges posed by limited infrastructure and technological resources.

In summation, this research underscores the complex interplay of factors affecting the flow of information to farmers through extension services. By identifying effective strategies and fostering a collaborative environment, extension workers can pave the way for improved agricultural practices and enhanced outcomes for both farmers and the agricultural sector as a whole.

# References


Amoo, N., & Hiddlestone-Mumford, J. (2017). Development and Validation of Multi-Dimensional Measures for Strategy Implementation. *Strategy & Organizational Behaviour EJournal*, *6*(22).

Amoo, N., Hiddlestone-Mumford, J., Ruzibuka, J., & Akwei, C. (2019). Conceptualizing and measuring strategy implementation: A multidimensional view. *Strategic Change*, *28*(6), 445–467. https://doi.org/https://doi.org/10.1002/jsc.2298

Bellamy, L., Amoo, N., Mervyn, K., & Hiddlestone-Mumford, J. (2019). The use of strategy tools and frameworks by SMEs in the strategy formation process. *International Journal of Organizational Analysis*, *27*, 337–367. https://doi.org/10.1108/IJOA-02-2018-1363

Bodie, G. D., Vickery, A. J., Cannava, K., & Jones, S. M. (2015). The role of "active listening" in informal helping conversations: Impact on perceptions of listener helpfulness, sensitivity, and supportiveness and discloser emotional improvement. *Western Journal of Communication, 79(2), 151-173.* https://doi.org/10.1080/10570314.2014.943429.

Chakraborty, K., Mondal, S., & Mukherjee, K. (2019). Critical analysis of enablers and barriers in extension of useful life of automotive products through remanufacturing. *Journal of Cleaner Production*, *227*, 1117–1135. https://doi.org/10.1016/j.jclepro.2019.04.265

Chambers, R. (1994). Participatory rural appraisal (PRA): Challenges, potentials and paradigm. *World Development*, *22*(10), 1437–1454. https://doi.org/https://doi.org/10.1016/0305-750X(94)90030-2

Chambers, R. (1995). Poverty and livelihoods: Whose reality counts? *Environment & Urbanization*, *7*(1), 173–204. https://doi.org/10.1177/095624789500700106

Chambers, R. (1997). *Whose Reality Counts?: Putting the First Last*. Intermediate Technology.

Chambers, R., & Conway, G. (1992). Sustainable rural livelihoods: practical concepts for the 21st century. *IDS Discussion Paper*, *296*.

Chesterman, N. S., Entwistle, J., Chambers, M. C., Liu, H.-C., Agrawal, A., & Brown, D. G. (2019). The effects of trainings in soil and water conservation on farming practices,

livelihoods, and land-use intensity in the Ethiopian highlands. *Land Use Policy*, *87*, 104051. https://doi.org/https://doi.org/10.1016/j.landusepol.2019.104051

Clayton, A. S. (2017). Multiplayer educational role playing games (MPERPGs) and the application of leadership (Doctoral dissertation, Grand Canyon University). *Https://Www.Proquest.Com/Openview/726cd873f20b7e6cba2ad8494c3c4435/1?Pq-Origsite=gscholar&cbl=18750*.

Comito, J., Haub, B. C., & Stevenson, N. (2017). Field day success loop. *Journal of Extension*, *55*(6), 29. https://doi.org/10.34068/joe.55.06.29

Elahi, E., Zhang, H., Lirong, X., Khalid, Z., & Xu, H. (2021). Understanding cognitive and socio-psychological factors determining farmers' intentions to use improved grassland: Implications of land use policy for sustainable pasture production. *Land Use Policy*, *102*, 105250. https://doi.org/https://doi.org/10.1016/j.landusepol.2020.105250

Forrest III, S. P., & Peterson, T. O. (2006). \It's called andragogy. *Academy of Management Learning & Education, 5(1), 113-122. Https://Doi.Org/10.5465/Amle.2006.20388390*.

Gautam, M. (2000). *Agricultural Extension: The Kenya Experience : an Impact Evaluation*. World Bank.

Giller, K. E., Delaune, T., Silva, J. V., Descheemaeker, K., van de Ven, G., Schut, A. G. T., van Wijk, M., Hammond, J., Hochman, Z., Taulya, G., Chikowo, R., Narayanan, S., Kishore, A., Bresciani, F., Teixeira, H. M., Andersson, J. A., & van Ittersum, M. K. (2021a). The future of farming: Who will produce our food? *Food Security*, *13*(5), 1073–1099. https://doi.org/10.1007/s12571-021-01184-6

Giller, K. E., Delaune, T., Silva, J. V., Descheemaeker, K., van de Ven, G., Schut, A. G. T., van Wijk, M., Hammond, J., Hochman, Z., Taulya, G., Chikowo, R., Narayanan, S., Kishore, A., Bresciani, F., Teixeira, H. M., Andersson, J. A., & van Ittersum, M. K. (2021b). The future of farming: Who will produce our food? *Food Security*, *13*(5), 1073–1099. https://doi.org/10.1007/s12571-021-01184-6

Gladek, E., Fraser, M., Roemers, G., Sabag Munoz, O., Kennedy, E., & Hirsch, P. (2017). *Global Food System: An Analysis - Metabolic*. WWF Netherlands,March.

Goedde, L., Horil, M., Sanghvi, S., Katz, J., Menard, A., & Revellat, J. (2020). *Agriculture' s connected future: How technology can yield new growth*. McKinsey Quarterly. https://www.mckinsey.com/industries/agriculture/our-insights/agricultures-connected-future-how-technology-can-yield-new-growth

Higgins, K. L. (2015). *Economic Growth and Sustainability: Systems Thinking for a Complex World (S. Bentley, M. Bailey, & M. Read (eds.))*. Academic Press Elsevier.

Kahn, C. H. (1981). Did Plato Write Socratic Dialogues? *The Classical Quarterly*, *31*(2), 305–320. https://doi.org/10.1017/S0009838800009617

Khanna, P., Roberts, C., & Lane, A. S. (2021). Designing health professional education curricula using systems thinking perspectives. *BMC Medical Education*, *21*(1), 20. https://doi.org/10.1186/s12909-020-02442-5

Knezic, D., Wubbels, T., Elbers, E., & Hajer, M. (2010). The Socratic Dialogue and teacher education. *Teaching and Teacher Education*, *26*(4), 1104–1111. https://doi.org/https://doi.org/10.1016/j.tate.2009.11.006

Knowles, M. S., Holton, E.F., I., & Swanson, R. A. (2012). The Adult Learner (7th ed.). Burlington. *MA: Elsevier, Inc. Http://Intrpr.Info/Library/Books/Knowles-the-Adult-Learner.Pdf*.

Lamboll, R., Nelson, V., Gebreyes, M., Kambewa, D., Chinsinga, B., Karbo, N., Rukonge, A., Sekeleti, M., Wakun'uma, W. L., Gutema, T. H., Henjewele, M., Kampanje-Phiri, J.,

Masikati-Hlanguyo, P., Quaye, W., Duah, S., Kivuyo, M., Nyanga, P., Essilfie, M. A., Asafu-Adjaye, N. Y., … Martin, A. (2021). Strengthening decision-making on sustainable agricultural intensification through multi-stakeholder social learning in sub-Saharan Africa. *International Journal of Agricultural Sustainability*, *19*(5–6), 609–635. https://doi.org/10.1080/14735903.2021.1913898

Li, J., Ma, W., Wang, P., & Meng, X. (2023). Farmers' willingness to transform untreated livestock manure into organic fertilizer: does information technology adoption make a difference? *Environment, Development and Sustainability*. https://doi.org/10.1007/s10668-023-02920-y

Lowa Learning Farm. (2014). *10-year report. Ames, Iowa*. Retrieved From https://www.iowalearningfarms.org/resources/.

Lowa Learning Farm. (2016). *Building a culture of conservation: 2016 evaluation report. Ames, Iowa*. Retrieved From https://www.iowalearningfarms.org/resources/.

Lowder, S. K., Skoet, J., & Raney, T. (2016). The Number, Size, and Distribution of Farms, Smallholder Farms, and Family Farms Worldwide. *World Development*, *87*, 16–29. https://doi.org/https://doi.org/10.1016/j.worlddev.2015.10.041

Machado, P. C., Chung, C., & Ng'ombe, J. N. (2023). Threshold vector error correction model and transaction cost variation. *Applied Economics*, 1–14. https://doi.org/10.1080/00036846.2023.2244238

Maulu, S., Hasimuna, O. J., Mutale, B., Mphande, J., & Siankwilimba, E. (2021). Enhancing the role of rural agricultural extension programs in poverty alleviation: A review. *Cogent Food \& Agriculture*, *7*(1), 1886663. https://doi.org/10.1080/23311932.2021.1886663

Mikhailov, A., Oliveira, C., Padula, A. D., & Reichert, F. M. (2021). Californian innovation ecosystem: emergence of agtechs and the new wave of agriculture. *Innovation and Management Review*, *18*(3), 292–307. https://doi.org/https://doi.org/10.1108/INMR-12-2018-0098/FULL/HTML

Msuya, C. P., Ladele, A., Huhela, K., Tselaesele, N. M., Msatilomo, H., Chowa, C., & Zwane, E. (2017). The Role of Agricultural Extension in Africa's Development, the Importance of Extension Workers and the Need for Change. *International Journal of Agricultural Extension*, *5*(1), 51–58.

Mumba, C., Sichone, J. M., Munsaka, S., Kwenda, G., Munyeme, M., Simuunza, M., Hang'ombe, B. M., Phiri, A. M., Mutale, W., Martin, M. H., Heimburger, D. C., Nalubamba, K. S., Nchito, W., Katowa-Mukwato, P., Hondalus, M., Skjerve, E., & Muma, J. B. (2023). Towards a competency-based doctoral curriculum at the University of Zambia: lessons from practice. *Frontiers in Education*, *8*. https://doi.org/10.3389/feduc.2023.1224075

Mzyece, A., Shanoyan, A., Amanor-Boadu, V., Zereyesus, Y. A., Ross, K., & Ng'ombe, J. N. (2023). How does who-you-sell-to affect your extent of market participation? evidence from smallholder maize farmers in Northern Ghana. *Cogent Economics & Finance*, *11*(1), 2184062. https://doi.org/10.1080/23322039.2023.2184062

Nature Editorial. (2019). Counting the hidden $12-trillion cost of a broken food system. *Nature*, *574*(7778), 296. https://doi.org/https://doi.org/10.1038/d41586-019-03117-y

Niles M, Bertmann F, Belarmino E, Wentworth T, Biehl E, & Neff R. (2020). *The early food insecurity impacts of covid-19. Nutrients [revista en Internet] 2020 [acceso 2 de noviembre de 2021]; 12(7): 1-23.*

Norton, G. W., & Alwang, J. (2020). Changes in Agricultural Extension and Implications for Farmer Adoption of New Practices. *Applied Economic Perspectives and Policy*, *42*(1), 8–20. https://doi.org/https://doi.org/10.1002/aepp.13008

Pinto, J., Dissanayake, R. B., Dhand, N., Rojo-Gimeno, C., Falzon, L. C., Akwar, H., Alambeji, R. B., Beltran-Alcrudo, D., Castellan, D. M., Chanachai, K., Guitian, J., Hilmers, A., Larfaoui, F., Loth, L., Motta, P., Rasamoelina, H., Salyer, S., Shadomy, S., Squarzoni, C., … Tiensin, T. (2023). Development of core competencies for field veterinary epidemiology training programs. *Frontiers in Veterinary Science*, *10*. https://doi.org/10.3389/fvets.2023.1143375

Pound, B., & Conroy, C. (2017). *Chapter 11 - The Innovation Systems Approach to Agricultural Research and Development* (S. Snapp & B. B. T.-A. S. (Second E. Pound, Eds.; pp. 371–405). Academic Press. https://doi.org/https://doi.org/10.1016/B978-0-12-802070-8.00011-6

Prayitno, G., Auliah, A., Ari, I.R.D., Effendi, A., Hayat, A., Delisa, A., Siankwilimba, E. and Hiddlestone-Mumford, J. (2024). Social capital for sustainable tourism development in Indonesia. *Cogent Social Sciences,* 10(1), p.2293310. https://doi.org/10.1080/23311886.2023.2293310

Siankwilimba, E. (2019). Effects of Climate Change induced electricity load shedding on small holder agricultural enterprises in Zambia: The case of Five Southern Province Districts. *IJRDO-Journal of Agriculture and Research (ISSN: 2455-7668)*, *5*(8), 1–151. https://doi.org/10.53555/ar.v5i8.3184

Siankwilimba, E., Hiddlestone-Mumford, J., Hoque, E.-M., Hang'ombe, M. B., Chisoni, M., Hasimuna, O. J., Maulu, S., Mphande, J., Chibesa, M., Moono, M. B., Muhala, V., Cavaliere, L. P. L., Faccia, A., & Prayitno, G. (2023a). Sustainability of Agriculture Extension Service in the Face of COVID-19 : A Study on Gender Market Systems. *Cogent Food & Agriculture*, 9(2), 25. https://doi.org/10.1080/23311932.2023.2284231

Siankwilimba, E., Mumba, C., Hang'ombe, B. M., Munkombwe, J., Hiddlestone-Mumford, J., Dzvimbo, M. A., & Hoque, M. E. (2023b). Bioecosystems towards sustainable agricultural extension delivery: effects of various factors. *Environment, Development and Sustainability 2023*. https://doi.org/10.1007/s10668-023-03555-9

Siankwilimba, E., Mwaanga, E., Munkombwe, J., Mumba, C., & Hang'ombe, M. (2021). Effective Extension Sustainability in the face of COVID- 19 Pandemic in Smallholder Agricultural Markets. *International Journal of Applied Science and Engineering Research*, *9*, 865–878. https://doi.org/10.22214/ijraset.2021.39403

Siankwilimba, E., Sharma, B., & Hoque, M. E. (2023c). Polysaccharides for Agricultural Applications: A Growing Presence on the Farms. In Polysaccharides (pp. 263-286). In Sharma, B., & Hoque, M. E. (Eds.). *Polysaccharides: Advanced Polymeric Materials.* CRC Press.

Smith, R. (2011). The Play of Socratic Dialogue. *Journal of Philosophy of Education*, *45*(2), 221–233. https://doi.org/10.1111/j.1467-9752.2011.00794.x

Stavru, A., & Moore, C. (2017). *Socrates and the Socratic Dialogue*. Brill. https://doi.org/https://doi.org/10.1163/9789004341227

Sutton, P. C., Anderson, S. J., Costanza, R., & Kubiszewski, I. (2016). The ecological economics of land degradation: Impacts on ecosystem service values. *Ecological Economics*, *129*, 182–192. https://doi.org/https://doi.org/10.1016/j.ecolecon.2016.06.016

The Springfield Centre. (2015). *The Operational Guide for the Making Markets Work for the Poor (M4P) Approach, 2nd edition,*. Funded by SDC & DFID.

Todaro, M. P., Smith, S. C., & Pearson. (2020). *Economic Development*. Pearson.

Vollset, S. E., Goren, E., Yuan, C. W., Cao, J., Smith, A. E., Hsiao, T., Bisignano, C., Azhar, G. S., Castro, E., Chalek, J., Dolgert, A. J., Frank, T., Fukutaki, K., Hay, S. I., Lozano, R., Mokdad, A. H., Nandakumar, V., Pierce, M., Pletcher, M., … Murray, C. J. L. (2020). Fertility, mortality, migration, and population scenarios for 195 countries and territories from 2017 to 2100: a forecasting analysis for the Global Burden of Disease Study. *The Lancet*, *396*(10258), 1285–1306. https://doi.org/10.1016/S0140-6736(20)30677-2

Wang, C. X., Anstadt, S., Goldman, J., & Lefaiver, M. L. (2014). Facilitating group discussions in second life. *Journal of Online Learning and Teaching, 10(1), 139-152*.

Yohane, R., Mwanza, B., & Chowa, T. (2022). Review of Pension Systems in Institutions of Higher Learning: Key Lessons for Zambia, *IOEM Societal International,* 1-9. Proceedings of the International Conference on Industrial Engineering and Operations Management Sao Paulo, Brazil, April 5 - 8, 2021. https://www.ieomsociety.org/brazil2020/papers/816.pdf

ISBN 978-621-96812-9-2

**For more information, please kindly visit our international website https://fsh-publication.com/public/**

**ebook is also available on the FUTURE SCIENCE market Place: http://book.futuresciencepress.com**

**You can reach us through WhatsApp and Email**
**1. +639088602939 (Philippine)**
**2. +6282257922819 (Indonesia)**
**Email: editor@futuresciencepress.com**