Migration Letters

Volume: 21, No: S2(2024), pp. 287-301

ISSN: 1741-8984 (Print) ISSN: 1741-8992 (Online)
www.migrationletters.com

Pentahelix Model in The Development of Border Area at Napan-East Nusa Tenggara with Timor-Leste

Yoos Suryono Hadi[1], Moh. Khusaini[2], Moh. Fadli[3], Adi Kusumaningrum[4]

Abstract

Border areas are areas that directly border neighboring countries. The border position provided vulnerability to security disturbances and increasingly higher welfare demands. This was supported by various data on territorial violations which are still high, the level of welfare is not yet high, as well as various environmental problems in development. This was also experienced by Napan village - North Bikomi sub-district which directly borders Timor-Leste. For this reason, comprehensive development involving all relevant stakeholders is needed. This research was conducted qualitatively involving research subjects from various relevant stakeholders including: Timor-Leste Embassy staff, National Border Management Agency staff at Napan, the Head of Napan Village, the Border Task Force, the Bikomi sub-district Military District Commander, and the Kupang Navy Main Base Operations Assistant. The qualitative method used was Interpretive structural modeling to determine the roles that can be played by all stakeholders related to borders according to their portions and proportions. The results of the research showed that modeling involving the central and regional governments, private sectors, universities, societies, and mass media were called the pentahelix proportionally in a relationship model that was able to optimize the development of the border area in Napan-East Nusa Tenggara.

Keywords: *Pentahelix Model, Border Area Development, East Nusa Tenggara*.

INTRODUCTION

Indonesia is a country that borders with many countries. Indonesia borders Malaysia, Singapore, the Philippines, Papua New Guinea, Timor Leste, India and Australia. The regions that share land borders with Indonesia are Malaysia, Papua New Guinea and Timor Leste. Most of the land border areas in Indonesia are underdeveloped areas with minimal social and economic facilities and infrastructure (Rahim et al., 2023).

Strategic issues in managing border areas involve setting national boundaries, enhancing defense, security, and law enforcement. Issues include border settlement, maintaining boundaries, and supervision, leading to boundary violations. The Indonesia-Timor Leste land border area faces economic, natural resources, infrastructure, population, and cultural conditions (Kennedy et al., 2019).

[1] Doctoral Student of Resilience Studies, Universitas Brawijaya, Malang, Indonesia, Email: yoos_suryono@tnial.mil.id, Orcid: https://orcid.org/0009-0005-6445-1980

[2] Professor of Regional Finance, Universitas Brawijaya, Malang, Indonesia, Email: khusaini@ub.ac.id, Orcid: https://orcid.org/0000-0002-2391-4732

[3] Professor of Law, Universitas Brawijaya, Malang, Indonesia, Email: mfadlifh@ub.ac.id, Orcid: https://orcid.org/0009-0009-9488-2617

[4] Doctor in International Law, Universitas Brawijaya, Malang, Indonesia, Email: adi_ningrum@ub.ac.id, Orcid: https://orcid.org/0009-0006-2597-1462

Napan is an underdeveloped village in North Central Timor district, East Nusa Tenggara Province, Indonesia. It is located at the border of the Democratic Republic of Timor Leste. The village has a dry tropical climate with an average temperature of 31.2 - 33.4 °C and uneven rainfall. The slope of the land in most of this area influences the fertility of some agricultural and plantation land (Kennedy et al., 2019).

Problems occurring in Napan include: - Low food productivity due to limited access to agricultural inputs and technology. - Multidimensional poverty, including hunger, powerlessness, lack of access to basic infrastructure, low levels of education, and poor health. - decline in local food production and consumption. - Land fragmentation and land ownership conflicts. - Lack of access to new agricultural knowledge and appropriate technology (Hindersah et al., 2018; Kennedy et al., 2019). Besides that, security problems along the Indonesia-Timor Leste border include cross-border crime, such as smuggling, human trafficking, and illegal logging (Paksi & Hutami, 2023; Rachmawati & Djalaludin, 2017).

In resolving border issues, various stakeholders are needed. All stakeholders must be involved according to their portions and proportions. Stakeholders in border area development include the government, local communities, the private sector and non-governmental organizations. (Kennedy et al., 2018).

Based on the facts of the Napan-East Nusa Tenggara region, and the complicated and complex problems it faces cannot be solved by just one agency or regional government. Therefore, it is necessary to involve many related stakeholders such as the government, private sector, society, universities and mass media, known as the role of the pentahelix. The problem in this research is how the pentahelix model can be used to solve problems on the Napan-East Nusa Tenggara border.

LITERATURE REVIEW

Development of Country Border Area

Developing border areas presents unique challenges and opportunities for countries. These areas often face geographic isolation, infrastructure limitations, and limited economic activity. However, they also possess strategic importance and hold potential for cultural exchange, resource sharing, and regional integration.

Border issues do not include only boundary points or boundary lines, but also related to social problems that follow, related to two different countries. (Nail, 2016). Challenges and threats of Border Area Development, are:

1. Geographic isolation: Border areas can be geographically isolated from the rest of the country, making it difficult to access markets, services, and infrastructure.

2. Infrastructure limitations: Infrastructure, such as roads, bridges, and communication networks, is often limited or lacking in border areas, further hindering economic activity and development.

3. Limited economic activity: Border areas often have a limited economic base, with a high dependence on subsistence agriculture or informal trade.

4. Security concerns: Border areas can be prone to conflict, instability, and illegal activity, making it difficult to attract investment and promote development.

5. Cultural differences: Border areas can be home to diverse populations with different languages, customs, and traditions. This can lead to social and cultural tensions and make it difficult to establish effective governance and cooperation.

Border area development indicators are: local resources, market, employment, investment, government, transportation and communication, and technology (Suryono Hadi et al., 2023). These indicators are explained in detail as follows:

1. Local resources. Local resources are part of what determines the success of development because local resources are the natural conditions of a region, which come from the region itself and can bring positive values to the region, besides that local resources can also provide benefits for the region to be developed to increase its power. competitive. For example, there are abundant mineral assets, fertile land, etc.

2. Market. The market is a location for regions to sell products produced in that region or obtain necessities obtained from other regions.

3. Employment. This is a resource for carrying out conversion of local resources in order to increase sales and results from products originating from regional production.

4. Investment. Development Development of an area requires investment in the form of capital investment in every activity. The more stable and improving, or in other words favorable regional conditions, the greater the domestic investment.

5. Government Capacity. The presence of the government is considered to be a determining factor in regional development because the government has a guiding role, besides that the government also plays a role in being a catalyst for the process and success of development.

6. Transportation. Considering the importance of connecting one area with other areas, the role of transportation becomes important. The connectivity that exists between one region and another can create support for shifts in goods and services, which also influences the development of growth in the region.

7. Technology. Technology is an important factor because technology can help the production process in an area increase productivity and efficiency.

Napan-East Nusa Tenggara

Napan is a village in North Bikomi District, North Central Timor Regency, East Nusa Tenggara Province, Indonesia. Napan is one of the villages in NTT that borders Timor Leste. Napan Village has an area of around 600 hectares and a population of around 2,500 people. Most of the Napan people work as farmers, livestock breeders, and traders. Napan Village has quite large tourism potential, especially natural tourism. This village has pristine natural beauty, with views of the mountains and forests that are still preserved. Apart from that, Napan Village also has cultural tourism potential, with people who still maintain their culture and traditions.

The Napan Village Government has made efforts to develop the village's tourism potential. The village government has built various tourism support facilities, such as roads, bridges, and parking lots. The village government has also promoted village tourism, both locally and internationally.

The following are some of the tourism potentials that Napan Village has:

1. Napan Waterfall: This waterfall has a height of about 50 meters and is located in the middle of the forest.

2. Napan Beach: This beach has white sand and clear sea water.

3. Napan Mountains: These mountains have beautiful views and cool air.

4. Napan Tourism Village: This village offers interesting cultural and natural tourism.

The Napan Village Government hopes that the village's tourism potential can be developed to improve community welfare. However, this village also has several border

threats that need to be watched out for. The following are some of the border threats that exist in Napan Village:

1. Border conflict: Napan Village directly borders Timor Leste. The border conflict between Indonesia and Timor Leste occurred in 2002. This conflict could have a negative impact on the people of Napan Village, both economically and socially.

2. Illegal logging: Napan Village has forests that are still maintained. This can attract the attention of illegal logging perpetrators. Illegal logging can damage the environment and reduce village tourism potential.

3. Illegal trade: Napan Village is located in the border area. This can be an entry point for illegal trade, such as weapons and drug smuggling. Illegal trade can endanger the security and safety of the people of Napan Village.

The Napan Village Government and regional governments need to work together to overcome the border threats that exist in Napan Village. The government can take several steps to overcome border threats, such as: The government can increase border patrols to prevent border conflicts, and the government can enforce the law against perpetrators of illegal logging and illegal trade. Improving community welfare: The government can improve community welfare to reduce the potential for border conflicts. The Napan Village community also needs to play an active role in overcoming border threats. The community can cooperate with the government to prevent border conflicts. The public can also report to the government if illegal logging or illegal trading occurs.

Pentahelix Model

The Pentahelix model is a collaboration of 5 (Five) elements of stakeholders, namely: Academics, Business, Community, Government, and Mass Media (Novy Setia Yunas et al., 2023; Rusmawan et al., 2023; Wisudayati et al., 2020). The pentahelix model is applied in various areas of development and solving social problems in society.

The pentahelix model can be applied in development to improve coordination and cooperation between stakeholders. This model can help to achieve national development goals that are more equitable and sustainable. The pentahelix model recognizes that development is the shared responsibility of various stakeholders, including government, academia, business, communities and the media. This model encourages collaboration and cooperation between stakeholders to achieve national development goals more effectively and efficiently. On the other hand, collaboration between stakeholders can help to increase effectiveness and efficiency in decision making. The pentahelix model can help to bring together various perspectives and interests to produce more comprehensive and fair decisions. Collaboration between stakeholders can help to increase innovation and creativity. The pentahelix model can encourage collaboration between various stakeholders to produce new ideas and creative solutions to development problems. Collaboration between stakeholders can help to increase community participation in development. The pentahelix model can encourage community involvement in the planning and implementation process of national development. Collaboration between stakeholders can help to increase the social and economic impact of development. The pentahelix model can help to ensure that development provides equitable benefits for all stakeholders (Novy Setia Yunas et al., 2023; Rusmawan et al., 2023; Wisudayati et al., 2020).

Development of border areas cannot only rely on government support. However, in practice, the strategy and implementation of border area development requires many stakeholders to support it. This is caused by the complexity of problems in border areas (Nail, 2016). In this way, it is possible to resolve border issues by utilizing the pentahelix relationship of all relevant stakeholders. Diagrammatically presented as follows.

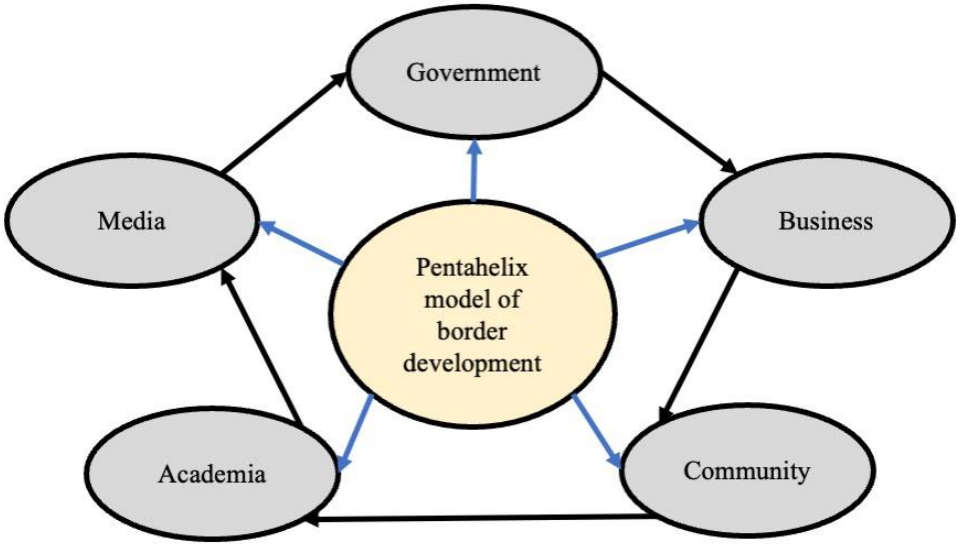

Figure 1. Pentahelix Model of Border Development

Previous Research

Indonesia's border areas face challenges such as conflicting management authorities, poverty, development disparities, and technological mastery gaps. The potential of natural resources is not fully utilized, highlighting the need for responsive local regulations. The Regional Government's commitment to building a prosperous and socially equitable border area is crucial. The Sambas Regency needs regional regulations with integrated border management values, considering not only infrastructure and physical development but also the welfare of border communities. Central Government policies and development cannot be effectively implemented in the border area.(Sutrisno & Sugiarti, 2021). Research results that show the ineffectiveness of development policies by the central government require other efforts. This provides an indication that more efforts are needed to produce development effectiveness. This is relevant to research on border area development that is currently being carried out, namely using the basic thinking in research that synergy is needed between relevant stakeholders in border area development.

Poverty in Indonesia is a complex issue involving lack of consumption, basic needs fulfillment, low education, unemployment, malnutrition, and low-quality human resources. To overcome poverty, regional governments aim to create economic activities in the region, focusing on economic growth. Nusa Tenggara Timur, located in the sixth-poorest province in Indonesia, is a border region with cross-border trade between two countries. To develop the people's economy in this area, a SWOT analysis approach is used to identify the correct strategies for cross-border trade sector development.(Oki, 2019). The issue of poverty alleviation in the border areas of Nusa Tenggara Timor is closely related to this article. The analysis used ultimately also provides recommendations for involving various related stakeholders in the resolution. The relevance of this research is that the stakeholders mentioned in the research results will be equipped and integrated in a pentahelix model.

This paper discusses the importance of development policy in addressing the issues faced by people in border areas, which are often isolated and lagging. Collaboration between the government and local communities is crucial to improve social life quality. The paper argues that development should be viewed as a necessity for every government to make progress and improve citizens' lives. It also emphasizes the role of ethics in making development more meaningful for the entire human life and environment.(Sudiar &

Irawan, 2018). Development that emphasizes the importance of humans and the environment is an important part of border area development. According to previous theory (Kennedy, 2021), development of border areas also needs to use an environmental approach. This is very relevant to the research being conducted currently.

This study examined the development of district government institutions in the border areas of the country, using a qualitative descriptive method. Data collection involved interviews with government officials and Sanggau district officials. The results showed that the implementation of district institutions in the Entikong Border Area requires different work norms, tasks, and functions, requiring different structures and resources. The study aims to integrate the tasks and functions of ministries and district government agencies into the district institutional structure.(Setiawan et al., 2022). The integration of central and regional government functions in the development of border communities is actually a form of synergistic communication and interaction between the central and regional governments. This is of course an important part in optimizing the border area development process. The pentahelix model proposed in this research can adopt this synergy model.

The article discussed research on Cross-Border Posts (CBPs) management in Belu, specifically in Mota'ain, Motamasin, and Turiskain. It proposes a model with two changes: withdrawing military personnel and assigning a new social function based on local historical, social, and economic backgrounds. Interviews were conducted to gather information on socio-cultural and economic needs. (Rachmawati & Djalaludin, 2017). This article provides suggestions for increasing the role of communities in border area development. This can be an important part of the research being carried out.

The Public Service Agency aims to enhance relevance and responsiveness to stakeholder needs by providing efficient goods and services. The Pentahelix Collaboration Model optimizes five roles: business, government/management, community, researchers, and media. The case study at the Forest Tree Seed Technology Research and Development Center focuses on market differentiation, budget flexibility, community policies, research innovation, and media professionalism. The model adapts Kurt Lewin's action research into four stages: planning, action, observation, and reflection (Wisudayati et al., 2020). The results of this research inspire the application of the pentahelix model in the field of border area development.

Tosari and Sapikerep villages in Indonesia are focusing on agrocultural based edutourism, a potential development in their area. The pentahelix development model, which involves collaboration with government, private sector, academia, mass media, and community, has been successful in achieving these goals. The central government and regional governments have supported infrastructure development, licensing, and public facilities, while the private sector has partnered with companies and investors through Corporate Social Responsibility. The media plays a crucial role in promoting tourism, while academics collaborate on scientific planning (Novy Setia Yunas et al., 2023). Example of distribution of development implementation that optimizes the pentahelix model. In the process of developing border areas, it is possible to make various adjustments.

METHOD

This research uses qualitative research. (Creswell & Creswell, 2018; Ugwu & Val, 2023). The subjects of this research include: the Indonesian ambassador to Timor Leste, National Border Development Agency staff in Napan, the head of Napan Village, Commander of the Napan Navy Post, Operations Assistant for the Kupang Navy Main Base. The qualitative method used is Interpretive Structural Modeling.

Interpretive Structural Modeling (ISM) is a qualitative research technique used to analyze complex systems by identifying and mapping the relationships between various elements

within the system. It is particularly useful for situations where the relationships are not readily apparent or where there are a large number of elements involved. The ISM process typically involves the following steps:(Alawamleh et al., 2023; Gorzeń-Mitka, 2019)

1. Identification of elements: The first step is to identify the key elements or variables that are relevant to the problem or issue being studied. This is usually done through a review of the literature, interviews with experts, and/or group discussions.

2. Development of a contextual relationship matrix: A matrix is created where each element is compared with every other element to determine the direction of the relationship between them. This is typically done using a set of predefined symbols, such as V (element i influences element j), A (element j influences element i), C (elements i and j influence each other), or D (no relationship between elements i and j).

3. Reachability matrix: The reachability matrix is derived from the contextual relationship matrix by applying transitive relationships. This helps to identify the direct and indirect influences between elements.

4. Level partitioning: Based on the reachability matrix, the elements are partitioned into different levels, based on their driving power and dependence. Driving power refers to the element's influence on other elements, while dependence refers to the element's reliance on other elements.

5. Model development: A directed acyclic graph (DAG) is then constructed to visually represent the relationships between the elements. The DAG shows the driving and dependence relationships between elements, as well as the overall structure of the system.

RESULT AND DISCUSSION

The pentahelix model is a framework for collaborative development that involves five key stakeholders:

1. Government: National and local government agencies responsible for policy, planning, and funding.

2. Academia: Universities, research institutions, and knowledge providers.

3. Private Sector: Businesses, entrepreneurs, and investors.

4. Civil Society: NGOs, community organizations, and social entrepreneurs.

5. Mass Media: Communication channels and platforms for information sharing and public engagement.

This model is particularly relevant for border area development, as it fosters collaboration between diverse actors who bring different perspectives, resources, and expertise to the table. The following are the research results according to the research steps using ISM based on data processing. The data processed is the result of in-depth interviews with research subjects, namely the Indonesian ambassador to Timor Leste, BPNN staff in Napan, the head of Napan Village, Commander of the Napan Navy Post, Operations Assistant for the Kupang Navy Main Base.

First step of ISM

The First step is to identify variables that influence the development of border areas. Identification was carried out both theoretically and as a result of interviews conducted with expert sources. The results of these two sources were triangulated to obtain a list of qualitatively valid and reliable variables. The results obtained are in accordance with table 1 as follows.

Table 1. Identification of variables that influence the development of border areas

No	Variables	Variable Description
1	Security Approach	Approach Variable (Kennedy, 2021)
2	Prosperity Approach	Approach Variable (Kennedy, 2021)
3	Environmental Approach	Approach Variable (Kennedy, 2021)
4	Labor	Implementation Variable (Suryono Hadi et al., 2023)
5	Market	Implementation Variable (Suryono Hadi et al., 2023)
6	Technology	Implementation Variable (Suryono Hadi et al., 2023)
7	Local resources	Implementation Variable (Suryono Hadi et al., 2023)
8	Transportation & communications	Implementation Variable (Suryono Hadi et al., 2023)
9	Investment	Implementation Variable
10	Government	Actor Variable Media (Novy Setia Yunas et al., 2023; Rusmawan et al., 2023; Wisudayati et al., 2020).
11	Private sector	Actor Variable Media (Novy Setia Yunas et al., 2023; Rusmawan et al., 2023; Wisudayati et al., 2020).
12	Universities	Actor Variable Media (Novy Setia Yunas et al., 2023; Rusmawan et al., 2023; Wisudayati et al., 2020).
13	Civil Society	Actor Variable Media (Novy Setia Yunas et al., 2023; Rusmawan et al., 2023; Wisudayati et al., 2020).
14	Mass Media	Actor Variable Media (Novy Setia Yunas et al., 2023; Rusmawan et al., 2023; Wisudayati et al., 2020).

From table 1, it appears that three large groups of variables were identified in this research, namely development approach variables in border areas, border area development implementation variables, and actor variables as implementers of the border area development process. Based on table 1, it also appears that the possible relationships between the three large groups based on the results of the analysis can be prepared as a simple relationship model which can be developed according to the ISM steps as follows.

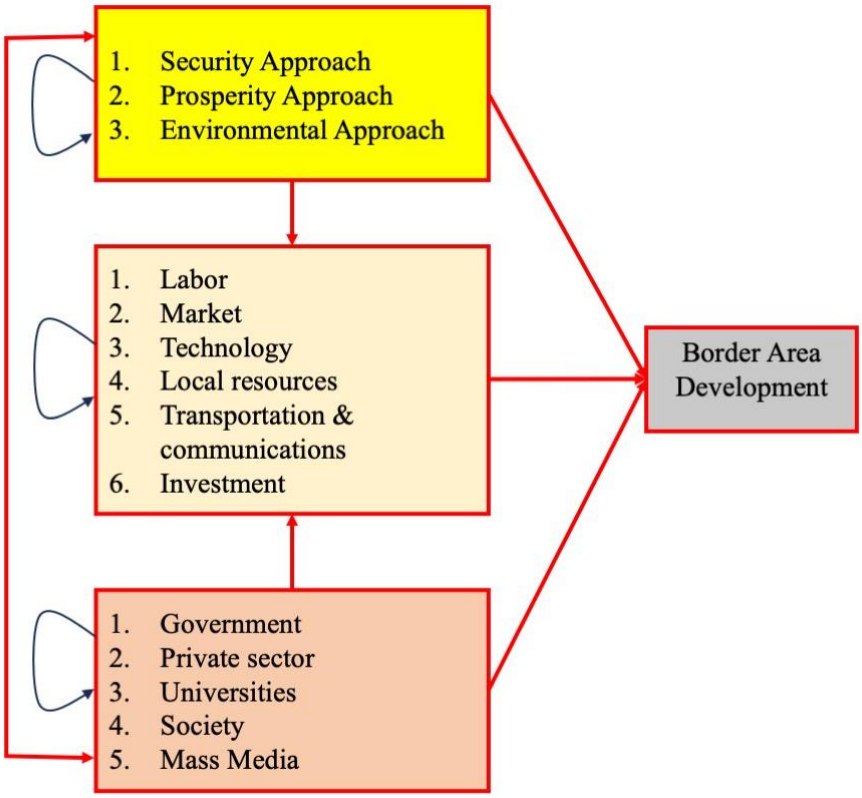

Figure 2. Hypothetical relationships between variables for border area development

Based on this hypothetical relationship, it appears that in general the three variables have an influence on the development of border areas. Furthermore, the approach variables and main development actor variables influence the development implementation variables. From these hypothetical relationships, the second step of ISM will then be prepared, namely in detail the relationship matrix which is arranged in detail in the form of a Structural Self-Interaction Matrix.

Second Step of ISM

Next, personal interviews were conducted with experts and academics. Experts and academics who were sources for this research were Indonesian embassy staff in Timor-Leste, BNPP staff in Napan, village head of Napan village, operational assistant for the Indonesian Navy's main base in Kupang, and lecturers at the Defense University of the Republic of Indonesia. Giving expert opinions uses the focus group discussion method to obtain agreement on answers. With a description of the answer as follows.

A if i predictor j

B if j predictor i

C if mutual predictors

D if it does not predict one or the other

The results of the expert opinion are then arranged in the form of a Structural self-interaction matrix (SSIM). In detail, the resulting SSIM is presented in table 1, as follows.

Tabel 1. Structural Self-Interaction Matrix (SSIM) of border area development pentahelix model

No.	VARIABLES	14	13	12	11	10	9	8	7	6	5	4	3	2	1
1	Security Approach	B	B	B	B	B	A	A	A	A	A	A	A	C	
2	Prosperity Approach	B	B	B	B	B	A	A	A	A	A	A	A		
3	Environmental Approach	B	B	B	B	B	A	A	A	A	A	A			
4	Labor	B	B	B	B	B	C	B	B	B	A				
5	Market	B	B	B	B	B	C	B	B	B					
6	Technology	B	B	B	B	B	B	B	A						
7	Local resources	B	B	B	B	B	B	B							
8	Transportation & communication	B	B	B	B	B	A								
9	Investment	B	B	B	B	B									
10	Government	A	A	A	A										
11	Private sector	B	C	C											
12	Universities	A	A												
13	Society	B													
14	Mass Media														

Third Steps of ISM

Based on the SSIM matrix above, a reachable matrix is then prepared. If i leads to j (1 in RM) and j leads to k (1 in RM), then i transitively leads to k (1 in RM). This ensures consistency in indirect relationships. The consistency check is that if i leads to j (1 in RM) and j leads to i (A or X in RM), replace both with C so that they influence each other.

The main use of reachability matrix is to identify hierarchical levels: Elements that do not lead to other elements are at the top level, followed by elements that do lead to them, and so on. Finding the driving variable and the dependent variable: The driving variable does not have an incoming arrow, while the dependent variable does not have an outgoing arrow. Understanding system structure and dynamics: It reveals how elements interact and influence each other, helping in system analysis and modeling.

Table 2. Matrix Reachibility of Pentahelix Model

No.	VARIABLES	1	2	3	4	5	6	7	8	9	10	11	12	13	14	∑
1	Security Approach	1	1	1	1	1	1	1	1	1	0	0	0	0	0	9
2	Prosperity Approach	1	1	1	1	1	1	1	1	1	0	0	0	0	0	9
3	Environmental Approach	0	0	1	1	1	1	1	1	1	0	0	0	0	0	7
4	Labor	0	0	0	1	1	0	0	0	1	0	0	0	0	0	2
5	Market	0	0	0	0	1	0	0	0	1	0	0	0	0	0	2
6	Technology	0	0	0	1	1	1	1	0	0	0	0	0	0	0	4

7	Local resources	0	0	0	1	1	0	1	0	0	0	0	0	0	0	3
8	Transportation & communications	0	0	0	1	1	1	1	1	1	0	0	0	0	0	6
9	Investment	0	0	0	1	1	1	1	0	1	0	0	0	0	0	5
10	Government	1	1	1	1	1	1	1	1	1	1	1	1	1	1	14
11	Private sector	0	1	1	1	1	1	1	1	1	1	1	1	1	0	12
12	Universities	1	0	1	1	1	1	1	1	1	1	1	1	1	1	14
13	Society	1	1	1	1	1	1	1	1	1	0	1	0	1	0	11
14	Mass Media	1	1	1	1	1	1	1	1	1	0	1	0	1	1	12
	∑	6	6	8	13	14	11	12	9	12	3	5	3	5	3	

Fourth Step of ISM

Furthermore, a hierarchical diagram can be arranged after the reachability matrix by following these steps:

1. Determine the highest hierarchical level: The highest hierarchical level consists of elements that do not lead to other elements.

2. Repeat step 1 for each remaining level of the hierarchy: The next level of the hierarchy consists of elements that lead to elements at lower levels of the hierarchy.

3. Add arrows from elements at higher hierarchical levels to the elements they influence at lower hierarchical levels: Arrows can have single or multiple directions, depending on whether the relationship between elements is unidirectional or bidirectional.

The results of preparing the hierarchical diagram are as follows:

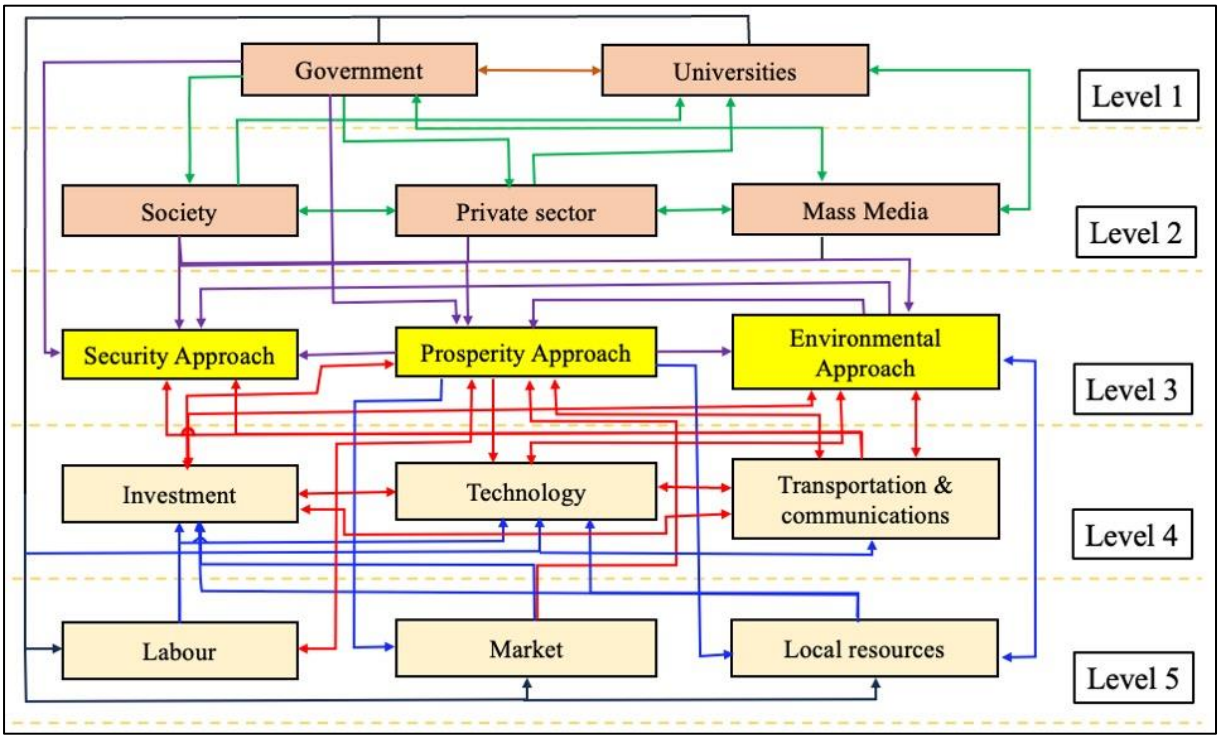

Figure 3. Hierarchical Pentahelix model for development of the NTT – Timor-Leste border area

Based on the hierarchical model of development of the East Nusa Tenggara and Timor Leste border areas mentioned above, it appears that there is a relationship between each variable according to its level. In detail, it can be explained as follows:

At the first level, there are governments, and universities. These two stakeholders are very important for the top-down program carried out by the government for the development of border areas. The government plans and implements development programs with State budget funds for border areas and communities. Apart from that, universities can become government partners in planning, implementing, controlling and supervising the implementation of development in border areas. Universities can also be used as consultants in research to plan the most optimal development programs in border areas.

At the second level, government policy also influences the role of the private sector in development as well as the role of society, including non-profit organizations which play an important role in implementing development. Government support is provided to the private sector by providing tax incentives and policies that make it easier to do business in border areas. Policy for non-profit organizations by providing coaching and financing support to actively participate in the development of border areas. Furthermore, the mass media plays an important role in providing information on planning, implementation and evaluation of border area development for border area communities and society in general (Khalid Idris & Eric Msughter, 2022). The private sector and society strongly support development when the environmental approach continues to show its role (Arifin & Rupita, 2021).

At the third level, the prosperity approach, security approach, and environmental approach are the three approaches that dominate border development. This is in accordance with previous research (Gunawan & Ratmono, 2018) which explains that a welfare and security approach is very important in the development of border areas. Both approaches are influenced by government policies. On the other hand, universities can be partnered as development partners in border areas so that they are right on target and effective for the short to long term (Smith & Smith, 2020). The environmental approach appears to be an important approach in the development of border areas. The environmental approach is influenced by the security approach and the welfare approach (Kennedy et al., 2019).

At the fourth level, the focus is on the role of investment, use of technology, and transportation and communication in development in border areas. Investment in border areas is strongly influenced by the security and welfare approach implemented. This is because the security stability and prosperity that exist in border communities will make investors feel comfortable in doing business at the border. On the other hand, currently investment is also starting to pay attention to and be influenced by environmentally friendly development policies. This is supported by the current high level of technology investment. Current development of other infrastructure, both security infrastructure and welfare infrastructure, really requires more efficient operations and good, measurable results (Rahim et al., 2023). The security approach, welfare approach and environmental approach require technology to carry out border area development better and more efficiently. Apart from that, all stakeholders who play a role in developing border areas are also greatly helped by increasing the use of technology. Digital economic infrastructure is now starting to play a strategic role in the development of border areas, especially to support economic development (ESCAP, 2017; Vdovkina et al., 2019). This is supported by the current high investment in technology. Current development of other infrastructure, both for security infrastructure and welfare infrastructure, really requires more efficient operations and good, measurable results. Investment in border areas is strongly influenced by the security and welfare approach implemented. This is because the stability of security and prosperity that exists in border communities will make investors feel comfortable in doing business at the border. On the other hand, currently

investment is also starting to pay attention to and be influenced by environmentally friendly development policies.

At the fifth level, it can be seen that ultimately all development in border areas is greatly influenced by labor, local resources and markets. Local resources greatly determine the success of border area development. This is related to natural resources and human resources which need to be given an optimal role in the development of border areas. A workforce that suits the needs of border areas and understands and can live in border areas in accordance with the unique and difficult challenges of borders is a necessity for workers in border areas. The market is the final exit from a business process, which brings together all interests. Suitability of needs and availability of goods and services is an inevitability that must be pursued by all stakeholders(Bantacut, 2016).

Based on that analysis, the pentahelix model can be applied in practice to joint projects and initiatives, knowledge sharing and capacity building, advocacy and policy dialogue, and Communication and stakeholder engagement. In detail, that application can be explained as follows:

1. Joint projects and initiatives: Stakeholders can collaborate on projects that address specific needs in the border area, such as developing cross-border tourism initiatives or establishing vocational training programs.

2. Knowledge sharing and capacity building: Academia can share research and expertise with other stakeholders, while the private sector can offer training and mentorship programs.

3. Advocacy and policy dialogue: Civil society and media can advocate for policies that benefit border communities, while the government can engage in dialogue with all stakeholders to develop effective solutions.

4. Communication and stakeholder engagement: Open communication channels and platforms are essential for ensuring all voices are heard and that development efforts are inclusive and responsive to community needs.

CONCLUSION

Based on the discussion above, it can be concluded that the pentahelix model for border area development can be developed. The pentahelix model involves elements of government, private sector, universities, society and mass media. Furthermore, the influence of pentahelix's participation in the development of the border area of East Nusa Tenggara and Timor Leste is very visible, both directly and indirectly. Overall model of relevant stakeholders and their roles in the development of the border area of East Nusa Tenggara and Timor Leste at five levels. The first level is the role of government and universities. The second level is the role of society, the private sector and mass media. The third level is the security, welfare and environmental approach. The fourth level involves investment, technology, transportation and communications. Meanwhile, the fifth level is labor, markets and local resources. Based on the pentahelix model, the roles of stakeholders and the areas that are the focus of development attention can be partially made explicit. Thus, the pentahelix model found in research using ISM Step provides a clearer picture of the role that needs to be played.

References

Alawamleh, M., Al-Twal, A., Lahlouh, L., & Jame, R. O. (2023). Interpretive structural modelling of organizational innovation factors: An emerging market perspective. Journal of Open Innovation: Technology, Market, and Complexity, 9(2). https://doi.org/10.1016/j.joitmc.2023.100067

Arifin, A., & Rupita, R. (2021). THE EFFECT OF ENVIRONMENTAL FACTORS TO THE LOCAL GOVERNMENT PUBLIC SERVICES AT THE BORDER REGION. Sosiohumaniora, 23(3), 299. https://doi.org/10.24198/sosiohumaniora.v23i3.31515

Bantacut, T. (2016). Integrated Regional Agro-Industry Based Border Area Development in Indonesia. Developing Country Studies, 6(12). www.iiste.org

ESCAP, U. N. (2017). A Study of ICT Connectivity for the Belt and Road Initiative (BRI): Enhancing the Collaboration in China-Central Asia Corridor.

Gorzeń-Mitka, I. (2019). Interpretive Structural Modeling Approach to Analyze the Interaction Among Key Factors of Risk Management Process in SMEs: Polish Experience. European Journal of Sustainable Development, 8(1). https://doi.org/10.14207/ejsd.2019.v8n1p339

Gunawan, B., & Ratmono, B. M. (2018). Perspectives on the Development of Border Regions in Indonesia. Research on Humanities and Social Sciences, 8(6). www.iiste.org

Hindersah, R., Kurniati, N., Rubiati, B., & Lita, H. N. (2018). Major Staple Food to Secure Food Availability in Napan Village, Nusa Tenggara Timur, Indonesia. International Journal of Recent Scientific Research, 9(1). https://doi.org/10.24327/ijrsr.2018.0901.1389

Kennedy, P. S. J., Josephine L Tobing, S., L Toruan, R., & Tampubolon, E. (2019). Indonesia-Timor Leste Border Issues In Nusa Tenggara Timur Province. Fundamentalmanagement Journal FUNDAMENTAL MANAGEMENT JOURNAL, 1, 2540–9816.

Kennedy, P. S. J., Tobing, S. J. L., Heatubun, A. B., & Toruan, R. L. (2018). Strategic Issues of Indonesian Border Area Development Based on The Master Plan 2015-2019. Proceeding International Seminar on Accounting for Society.

Khalid Idris, M., & Eric Msughter, A. (2022). Sources of Information on National Issues among Border Communities in Yobe State, Nigeria. ASEAN Journal of Community Engagement, 6(1). https://doi.org/10.7454/ajce.v6i1.1169

Nail, T. (2016). Theory of the Border. In Theory of the Border. Oxford University Press. https://doi.org/10.1093/acprof:oso/9780190618643.001.0001

Novy Setia Yunas, Susanti, A., Nadya Izana, N., & Widyawati, W. (2023). The Pentahelix Model in the Development of Agro-Culture-Based Edutourism in the Taman Nasional Bromo Tengger Semeru Buffer Village Area (A Study in Tosari Village, Pasuruan Regency and Sapikerep Village, Probolinggo Regency). Sodality: Jurnal Sosiologi Pedesaan, 11(1), 76–85. https://doi.org/10.22500/11202344218

Oki, K. K. (2019). Strategy of Community Economic Development in Border Area with Timor Leste through Cross Border Trade. International Journal of Business and Management Invention (IJBMI) ISSN, 24–30. www.ijbmi.org

Paksi, A. K., & Hutami, A. N. (2023). Counter-Human Trafficking in East Nusa Tenggara: The Urgency of Strengthening NGOs Role through Multilevel Collaborative Governance. Jurnal Ilmiah Hubungan Internasional, 19(1), 25–38. https://doi.org/10.26593/jihi.v19i1.5773.25-38

Rachmawati, I., & Djalaludin, F. (2017). Model of Indonesia-Timor Leste Land Border Management by Optimizing the Cross-Border Post in Belu Regency, East Nusa Tenggara. Jurnal Global & Strategis, 10(1), 1. https://doi.org/10.20473/jgs.10.1.2016.1-14

Rahim, D. A., Priyarsono, D. S., Rustiadi, E., & Syaukat, Y. (2023). Sustainable Development of Indonesia's Land Border Areas; Overview from an Economic Perspective. Jurnal Ekonomi Pembangunan: Kajian Masalah Ekonomi Dan Pembangunan, 24(1), 172–189. https://doi.org/10.23917/jep.v24i1.20387

Rusmawan, T., Kurniasih, D., Saputra, A. S., & Indranika, D. B. (2023). Penta Helix Model In Local Tourism Development Through "Peken Banyumasan." Journal of Governance, 8(2). https://doi.org/10.31506/jog.v8i2.18854

Setiawan, I., Madjid, U., & Wasistiono, S. (2022). Development Of Distric Institutions In The Entikong State Border Area, Indonesia. TRANSFORMASI: Jurnal Manajemen Pemerintahan, 158–172. https://doi.org/10.33701/jtp.v14i2.2917

Smith, R. B., & Smith, N. N. (2020). Cross-border development - a long-term role for Universities. ASEAN Journal of Community Engagement, 4(1). https://doi.org/10.7454/ajce.v4i1.1077

Sudiar, S., & Irawan, B. (2018). Indonesia's Development Policy to Increase Prosperity of the People in the Border Area. Advances in Social Science, Education and Humanities Research, 231. https://doi.org/10.1016/S0362-3319(03)00069

Suryono Hadi, Y., Khusaini, M., Fadli, M., & Kusumaningrum, A. (2023). Comparative Study of Border Area Development Models Through Security, Prosperity, and Environmental Approach at Sebatik and Miangas Islands [1*]. Tuijin Jishu/Journal of Propulsion Technology, 44(3), 1001–4055.

Sutrisno, E., & Sugiarti, T. (2021). Management Concept of Integrated Border Areas Through Regional Regulatory Product in Sambas Regency. Multicultural Education, 7(5), 2021. https://doi.org/10.5281/zenodo.4781360

Vdovkina, E., Shapovalova, S., & Poddubnova, S. (2019). The impact of the digital economy on the development of cross-border areas. International Conference on Sustainable Development of Cross-Border Regions: Economic, Social and Security Challenges (ICSDCBR 2019) .

Wisudayati, T. A., Hidayat, D. C., & Hendarto, K. A. (2020). Implementation of Pentahelix Collaboration Model in the Development of Government Institution's Potency as General Services Agency. Jurnal Penelitian Kehutanan Wallacea, 9(1), 13. https://doi.org/10.18330/jwallacea.2020.vol9iss1pp13-22