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Approach to Extension in Strengthening Community Ecology Adaptation in the Conflict Areas in the Border

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Abstract: The border areas tend to be faced with conflict problems. This study aims to analyze the role of extension agents in community empowerment resettlement and design appropriate policy alternatives to enhance the community's ecological adaptation in border areas through extension workers in community empowerment. The methods used in this study are participatory action research and cybernetic triangulation techniques. In the study approach, the key informants involved were local leaders, local officials, priests, and teenagers. NTT was chosen because it has a border area between countries, and several resettlement points of former East Timor joined the Republic of Indonesia. The study results showed that the resettlement successfully adapted to the fluctuation of ecological changes through the role of extension workers. The lessons learned from this success resulted in that empowerment by implementing extension, effectively increasing the strengthening of the communities' ecological adaptation, when the principles and philosophy of extension were applied consistently. The key success factors are: (1) Growing awareness of the prospect of resettlement; (2) Increasing the capacity and attitude to dynamic ecology; and (3) The success of the community in participatory development of cooperative-based business institutions.

Keywords: border areas, cooperation, ecological adaptation, private extension workers, social conflicts.

在边界冲突地区加强社区生态适应的扩展途径

摘要: 边界地区往往面临冲突问题。这项研究旨在分析推广人员在社区赋权安置中的作用,并设计适当的政策选择,以通过社区赋权推广人员来增强边境地区的社区生态适应。本研究中使用的方法是参与式行动研究和控制论三角剖分技术。在研究方法中,主要的信息提供者是地方领导人,地方官员,牧师和青少年。选择 NTT 是因为它在国家之间具有边界区域,并且前东帝汶的几个安置点加入了印度尼西亚共和国。研究结果表明,移民安置工作通过推广人员的作用成功地适应了生态变化的波动。从这一成功中吸取的教训是,通过一贯实施推广的原则和理念,可以通过实施推广来赋权,有效地加强了社区生态适应的加强。成功的关键因素有:(1)对移民安置前景的认识不断提高;(2)提高对动态生态的能力和态度;(3)社区在以合作社为基础的商业机构的参与式发展中取得的成功。

关键词: 边境地区,合作,生态适应,私人推广人员,社会冲突。

1. Introduction

Border areas tend to be faced with various problems and conflicts. Sumardjo [3] noted that several problems

occur in border areas, including: (1) low carrying capacity of the infrastructure that can serve the entire region, (2) relatively low agricultural productivity due

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to limited information and technology dissemination, (3) inability poor population to provide adequate food in sufficient quantities so that aspects of nutrition and food security have not been a major concern, and (4) poor quality of human resources. Poverty is the most prominent problem that occurs at the border [4]. This poverty occurs because the community's productive livelihood sources are very limited, which triggers human trafficking cases. This often triggers conflicts in this area.

Poverty reduction efforts become a major challenge in the border region [5]. The extent of the border area, both on land and sea, has various typologies, ranging from the interior to the small outer islands. Each region has different border characteristics. However, in general, border areas lag in terms of social and economic aspects. The high poverty rate in the border areas shows an inability to access productive resources due to the low capability of the community's technology, especially agricultural technology. Poverty affects the potential for food insecurity and is also vulnerable to potential conflicts, especially with the deterioration of human resources and limitations on the accessibility of natural resources.

The lack of public knowledge and technology adaptation in utilizing natural resources, especially in agriculture, makes agricultural activities harm the environment. Overexploitation without considering environmental aspects is often found in community activities at the border, especially in border areas with forest typology. Exploitation activities carried out continuously without regard to environmental rules will cause the degradation of natural resources. Neglect of these conditions causes damage to the environment in the border region. Extension activities are expected to be one of the solutions in educating the community to have a good understanding of utilizing the surrounding natural resources.

NTT Province is one of the regions bordering the country of Timor Leste. In March 2014, the NTT Province was generally at the poverty line of Rp 265,955 per capita/month, still below the national poverty line of Rp302,735 per capita/month. The number of poor people was 994.68 thousand people (19.82 percent). NTT is the province with the third-highest percentage of poor people in Indonesia (19.82%) after Papua (30.05%) and West Papua (27.13%). By paying attention to the components of the Poverty Line (GK) consisting of the Food Poverty Line (GKM) and the Non-Food Poverty Line (GKBM), it appears that the role of food commodities is still far greater than the role of non-food commodities (housing, clothing, education, and health). In September 2013, the contribution of GKM to GK was 79.17 percent, and in March 2014, it was 79.37 percent [6].

Based on the reality of poverty conditions in

Indonesia's border regions, especially in the NTT Province border, it indicates that the level of welfare of the people is still low. Plus, economically, the NTT border region is still far behind because of the lack of health facilities, education, information, and communication networks and is still isolated from the transportation network. Overcoming poverty at the border requires a comprehensive strategy covering various aspects, especially increasing human resource capacity. As for the assistance and empowerment activities carried out at one of the staging points in the NTT region, it integrates various programs with the strengthening capacity of human resources. The subject of assistance is the community of refugees from East Timor who have chosen to join the Republic of Indonesia. They have been placed in the resettlement area on the NTT-Timor Leste border until now by utilizing available non-productive land. In the implementation of empowerment programs, empowerment facilitators are placed who also act as private extension workers.

This paper aims to analyze the role of extension agents in the development of resettlement through community empowerment and design appropriate policy alternatives to enhance the ecological adaptation of communities in border areas through the role of extension agents in community empowerment. According to Law number 16 of 2006 concerning Agricultural, Fisheries, and Forestry Extension Systems [7], there are three well-known categories of regulators in Indonesia.

The three types of extension agents are: (1) government extension agents, (2) non-government of extension agents from local community leaders, and (3) private extension workers from non-government extension agents and funded by non-government parties. This empowerment activity utilizes the presence of 'private extension' workers, who are designed to play a role as empowering community facilitators, namely: (1) non-formal educators, (2) community organizers, and (3) development and strengthening of human and social capital. In addition, he also acts as a participant-observer in research which results are one of the main sources of analysis of this research.

The analysis of creative social forces is believed to help determine the level of ability of community settlements to adapt to the resettlement environment or ecology. Analyze the application of effective creative social energy (CSE) in 'community empowerment' [8]. CSE includes three elements, are ideals, ideas, and friendship. Ideals are hopefully conditions for realization. Realization in community empowerment is the clarity of goals, hopes, visions, and even the clarity of common ideals. These ideals will lead to clarity of thinking, that is, the common way to achieve these ideals. The form can be the clear

strategy, activity, method of the program, or technology, creatively and appropriately developed. Ideas become a guide for the development of friendship between interested parties, which is a network of cooperation between them through strategic partnerships [2, 9]. CSE is a form of participatory social engineering that has proven effective in empowering communities. This kind of 'participatory social engineering' is used to determine the ideals, ideas, and friendships of agricultural communities, farmers' communities, and farmers' communities. In this case, the community plays the main role, so there is no dominant position in the planning and evaluation process, its implementation, and the use of the collaborative results of community execution. This situation is a picture of CSE prepared in a 'participatory method' [1, 2].

Sumardjo's study [3] shows some different indicators compared to the previous studies. Community empowerment indicators consist of [3]: (1) powerless, (2) powerful/independence, and (3) autonomous/interdependence. Furthermore, the analysis of the adaptation behavior of ecological settlements refers to the concepts and research results of Sumardjo and Firmansyah [8], which includes the level of adaptation attitudes, from the weakest to the most powerful attitudes. They are fatalist, reactive, proactive, and anticipatory.

From the field observations by [1] and [8], the participants were divided according to a type of ecological adaptability. The research of Sumardjo [1] shows that there are four types of community adaptation to ecological change and land use innovation, namely: (1) apathetic, (2) reactive, (3) active, and (4) proactive/adaptive. This sequence also describes more adaptability to changes that occur. As mentioned earlier, the community profile is based on the type of ecological change adaptation. Their results are consistent with the research conducted by Sumardjo and Firmansyah [8] on empowering families to achieve dynamic ecological changes [10].

The novelty of this research is a humanist approach applied to society in reducing the level of conflict by the community against the government. This approach is different from the repressive approach that has been implemented by the government so far.

2. Method

The method used in this research is participatory action research and cybernetic triangulation techniques. In community empowerment, a community empowerment agent is placed who acts as a private extension agent. This empowerment agent participates in empowering community leaders and youth leaders. Planning for community empowerment programs is a participatory method [11] with a consistently participatory rural appraisal (PRA) approach. In the

study approach, the key informants involved were local leaders, local officials, pastors, and youth. NTT was chosen because it has a border area between countries. Several resettlement points of former East Timor joined the Republic of Indonesia and are potentially risky to radical conflict. Data analyzed were PRA results and notes (log book) of the observations during the community assistance program by the extension agent [11]. Analysis of community adaptation behavior uses the Sztompka [12] approach, which divides the stages of community adaptation into four stages, namely: (1) Skeptic / apathetic; (2) Reactive; (3) Proactive, and (4) Anticipatory. Meanwhile, to see the relationship between the level of adaptation with demographic variables with adaptability and other variables such as education level, character status, initiative, activity in the program, and the results enjoyed by the community participating in the empowerment program, statistical analysis is used here.

3. Results and Discussion

The results showed that resettlement was successfully developed in the resettlement behavior or attitude of the community towards the dynamics of ecological change through the role of extension workers [13]. The lessons learned from this success result in empowerment by applying extensions, effectively increasing the community's ecological adaptations, when principles and philosophies of extension are consistently applied. The key success factors are: (1) Participatively growing awareness of the prospect of resettlements; (2) Increasing capacity and adaptive attitudes to dynamic ecological changes, and (3) Community success in the participatory development of cooperative-based business institutions, and (4) selection of business commodities by settlements based on the market needs, and (5) functioning of local leadership cadres as sociopreneurs who empower settlements.

3.1. The Role of Extension Agents in Resettlement

The contribution of private extension agents in community empowerment is to grow and strengthen the empowerment and capacity of communities to be adaptive in resettlements. Community empowerment in resettlement locations in NTT's border regions develops in line with: (1) Growing awareness of the prospects of community life in the resettlement location, through the role of local figures who function as non-government by private extensionists/community empowerers, (2) Emerging and strengthening creative social energy in the process of empowerment, which includes ideals, ideas, and friendship, (3) The application of the principles of counseling in empowerment: learning by doing, and seeing is believing, and (4) selecting community business products oriented to the needs of the community or

market, and (5) the success of growing cadres whose community and youth leaders play a role as self-help extension agents. Overall this condition is in line with the findings of Sumardjo [1].

Cultivation grows and develops from (1) powerless, towards (2) powered/independence, and to the peak (3) Became autonomous/interdependence. This empowerment is marked by the strengthening of business competence in available land and joint efforts on commodities considered to be the wider community's needs, such as cakes and agricultural products produced by settlements. Strengthening the settlement capacity is characterized by strengthening empowerment and adaptation behavior towards ecological conditions in the restoration area.

The community empowerment program began with a meeting between settlers returning to discuss activities after resettlement, which manage farmland both individually and jointly. It was agreed that choosing an apprenticeship location was intended to understand the lives of farmers on land whose conditions were similar to the potential of natural resources in the location of new settlements on the borders between countries. The method used is an internship partly by food farmers and partly by horticultural farmers in West Java. The apprenticeship was attended by around 14 community leaders and young generation figures among the settlements.

Growing awareness of the prospect of resettlements in the region effectively raised awareness of future life prospects. The growth of awareness is conditioned by the main methods of empowerment, namely participatory methods and techniques with PRA. Furthermore, an apprenticeship process was conducted for settlements applied to farmers in Cianjur and Bogor, West Java, who are in the farming community with natural resource potential similar to local conditions around the resettlements. This apprenticeship method reinforces the understanding of the prospects (vision) of the characters when living in the area of resettlements.

This marked the emergence and strengthening of creative social energy in the empowerment process marked by strengthening ideals, ideas, and friendships in their perceptions and orientations to behave in the resettlement. The apprenticeship method has proven to be an effective participatory technique to foster an awakening of awareness of settlements to the conditions they wanted to realize (ideal) in resettlements. The apprenticeship effectively developed techniques and behavior ways (ideas) to realize the ideal conditions. The ways of learning this later became the orientation of behavior in the resettlements applied as ideas.

The principles of empowerment by applying the following extension principles have proven to be key factors in increasing competency and capacity settlements: (1) the principle of learning by doing by learning to farm and farming directly practice in farmers' places, and (2) the principle of seeing is believing by looking directly at farming methods and farming products to the packaging and marketing around the apprenticeship places, and (3) commodity selection based on the importance of market needs for community business products.

3.2. Attitudes of Ecological Adaptation of Communities in Border Areas

The participatory approach in community empowerment resettles on the convergent communication paradigm, which is technically dialogical, effectively increasing the capacity of empowerment and adaptive attitudes of settlement to dynamic ecological changes in the area of resettlements. The capacity of settlement empowerment increases in line with the increasing knowledge, attitudes, and skills of the community in managing the potential of existing natural resources and the community's adaptation attitude after empowerment. The relationship between the capacity of empowerment and adaptation behavior can be seen in Table 1.

Table 1 Relationship of empowerment capacity and behavior of ecological settlement adaptation

Capacity/empowerment	Adaptive behavior									
	Fatalist		Reactive		Proactive		Anticipative		Total	
	n	%	n	%	n	%	n	%	N	%
Powerless	4	90	1	10	0	0	0	0	5	100
Powerful	0	0	20	40	25	50	5	10	50	100
Autonomous	0	0	0	0	2	40	3	60	5	100
Total	4	7	21	35	27	45	8	13	60	100

The more empowered the community, the more visible it was to adapt better or vice versa. The more adaptive attitude was becoming, the more resilient settlement, and it makes the better living in the area of resettlement. The empowerment makes the behavior more proactive, independent, and adaptive, which is anticipatory. The conditions occurring in the area of resettlements are in line with the results of a study by

Sumardjo [1], who looked at the correlation between the level of adaptation with demographic variables with adaptability and other variables such as level of education, the status of figures, initiatives, activeness in the program and the results enjoyed by the program participants of community in the empowerment program (Table 2).

Table 2 Correlation coefficients between educational level, motivation, social status, initiative, yield, and adaptability

Variable	Education	Activeness	Social status	Inisiative	Yield	Adaptability
1. Education	1	-,177	-,110	-,087	,122	,000
2. Activeness	-,177	1	,905**	,867**	,860**	,881**
3. Social status	-,110	,905**	1	,901**	,760**	,874**
4. Inisiative	-,087	,867**	,901**	1	,837**	,845**
5. Yield	,122	,860**	,760**	,837**	1	,832**
6. Adaptability	,000	,881**	,874**	,845**	,832**	1

Note: N = 34 (census) [1]

**Correlation is significant at the 0.01 level (2-tailed)

*Correlation is significant at the 0.05 level (2-tailed)

In the area of resettlements also found positive and tangible relationships between such variables, which means the stronger the status of local leaders, the stronger initiative and activeness in empowerment activities, and the higher the adaptability and enjoy the results of participation in empowerment programs.

3.3. Carrying Capacity of the Environment and Infrastructure

The potential carrying capacity of resources and the environment seems conducive to developing community empowerment capacity in adapting to environmental changes from old settlements to resettlement. The carrying capacity of the environment greatly affects the survival of a community. For this reason, the carrying capacity of the environment in the form of natural resources must be maintained so as not to damage and adversely affect the lives of living things. In general, NTT Province's natural resources are quite large and varied. However, some potentials in each sector have not optimally been able to provide significant added value to the welfare of the people and the area of NTT. This is due to the lack of investment made.

In addition to the environment's carrying capacity, the availability of adequate infrastructure will encourage the development of community and business activities more easily and inexpensively. Suppose an investment can be made cheaply because of the availability of supporting infrastructure. In that case, the investment will increase so that it will stimulate economic growth, and the welfare of the community will improve. Infrastructure in the form of road networks and land and sea transportation in the border region is still very limited, making it difficult for the area to develop.

In addition, the condition of communication facilities and infrastructures such as radio and television transmitters or transmissions and telephone facilities in border areas is generally relatively minimal. The limited means of communication and information causes border communities to know more about neighboring countries than information and insights about Indonesia. The availability of basic social and economic facilities such as education,

health, and market facilities is still considered very limited, and its distribution is uneven. It cannot reach all villages on the border. This makes it difficult for border regions to develop and compete with neighboring countries. However, the area of resettlement can be a model of community empowerment in the border region with similar natural resource conditions.

3.4. Role of Extension Work in Empowering of Settlement in the Resettlement Area

Sustainability of community empowerment, from the perspective of the triple bottom line (people, profit, and planet), is highly dependent on the effectiveness of the role of extension agents to generate natural capital in the area of resettlements. Natural capital includes human capital, social capital, economic products, and environmental capital. The rising of human capital is marked by the strengthening role of settlements utilizing and managing the potential of natural resources and the environment in the area of resettlements. This was done by applying extension methods with the principles of learning by doing, and seeing is believing in community empowerment. The rising of social capital is marked by the strengthening of trust between local settlement leadership figures, partnership networking with market product settlements, and cooperative business institutions to manage joint ventures. Businesses that were developing are in the form of integration of livestock and biogas products, sorghum farming products and their processed products, fish pond product, and processed products of rural industry pastries. This also marked the rising of the productive local economy as economic product capital. Strengthening the aspects of natural capital is marked by efforts to manage natural resources that are environmentally friendly to sustain the environment.

3.5. Appropriate Policy Alternatives to Enhance the Attitude of Ecological Adaptation of the People in the Border Area

Continuity of empowerment efforts requires strategies: (1) Integration of extension role among independent extension agents, private extension agents,

and government extension agents that are conducive to the sustainability of empowerment and adaptive settlement behavior; (2) The success of the community in the participatory development of cooperative-based business institutions which in fact can increasingly make economic and social activities dynamic. This is indicated by the increasing efforts to develop alternative farming and the rise of agriculture from managing the potential of existing agricultural resources; (3) strengthening the development of types of commodities and communal businesses as joint ventures and in the future, it can lead to corporate management, as a further step in the functioning of pioneering cooperative institutions and their management; and (4) To create the diversity of types of businesses (integration of crops, fisheries and animal husbandry) that is expected to be able to sustain family income for daily / weekly, monthly and annual needs. Daily/weekly income is generated from the types of businesses that can be harvested daily, such as fish, livestock (eggs), and vegetables. Monthly income can be obtained through the types of plants/livestock that can be harvested every month. Annual income allows residents to have savings so that at any time requiring large amounts of funds, they can be obtained from this business unit.

4. Conclusions

This action research shows that the extension approach taken has positively impacted people who live in border areas and are vulnerable to potential conflicts. Some good values can be implemented for similar programs if carried out elsewhere.

Some of the key factors for the success of private extension workers in developing resettlements are:

1. Growing awareness of the prospects of resettlement.
2. Increased capacity and attitude towards settlement adaptive to dynamic ecology.
3. Development of business commodity settlements based on the market needs of the products it develops.
4. To create the diversity of businesses (integration of crops, fisheries, and animal husbandry) that are expected to sustain family income for daily / weekly, monthly, and annual needs.
5. The success of private extension workers functions local community leaders as self-help extension workers and,
6. The success of the community in participatory development of cooperative-based business institutions.

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Appendix

Program development is based on the results of identifying settlement needs in the area of resettlements by using PRA consistently. The results of the identification produced the following programs.

A. Integrated Farming Program

This integrated agriculture program has increased land productivity and community income through the commodities produced. At least their needs for carbohydrates and protein have been able to be met from field and pond.

Table 1 Some changes in the ability of agricultural cultivation

Before	After
• Does not have productive land	• There are already rice fields communal
• Insufficient knowledge of agricultural technology	• Understanding the application of agricultural technology (biogas, bioethanol, silage for feed, etc.)
• There is no income from agricultural farming	• New income from agric farming

- Do not understand how to fish farming
- Can breed fish

B. Use of Yard Land

At this time, the residents' yard has seen more beauty than the one that was originally not widely used by residents. Now the yard can produce useful vegetable products. Vegetables produced in the yard can already be sold by residents and consumed for daily necessities. There is almost no expenditure for residents to buy vegetables every day.

Table 2 Some changes in the use of yardland

Before	After
• Unproductive yardland	• Yard land to be productive
• Daily vegetable purchases	• No more vegetable purchases, even selling vegetables
	• Establishment of the nursery (vegetable) in resettlement
	• New income for HH

C. Field School Program

The field school program is intended to improve the quality of human resources, especially school-age children. This program is carried out outside the home and takes study time outside of school hours. An interesting teaching method by bringing children to the field so that they know firsthand what is taught makes children very enthusiastic. This program has a very real impact in increasing children's insights, both on basic material and the environment.

Table 3 Some change in the field school program

Before	After
• Low learning interest for school-age children	• Interest in learning increases
	• Increased knowledge of children
	• Concern for the environment

D. Non-Agricultural Development Program

The impact of this program is the formation of productive collective business institutions and the establishment of collaborative, productive business partnerships with household industry players as members of these joint business institutions. This illustrates the strengthening of the phenomenon of human capital that is the capacity of household industry players and managers of joint business institutions that support the strengthening of social capital in line with the growth and strengthening of trust between them in the form of a synergy of productive business cooperation networks.

Table 4 Some changes in the non-agric development program

Before	After
• Lack of alternative business as a HH income	• New income alternatives

<ul style="list-style-type: none"> • People have a hobby of gambling 	<ul style="list-style-type: none"> • Development of productive businesses • New business actors
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E. Institutional Development Program

After all business units are introduced to residents, management is needed to accommodate two objectives, namely: (1) building and strengthening togetherness between citizens and (2) professional management of all business units so that they are feasible and developing. Therefore, in the framework of these two objectives, an institution was formed which was the home of the citizens' activities, namely cooperatives. The name of the cooperative is KoperasiTani Makmur 1633.

With the existence of the cooperative, all business units are managed in it so that the cooperative manages the financing and profits. Through these cooperative institutions, settlement is taught how to organize business and group activities to share their benefits.

Table 5 Some changes in the institutional development program

Before	After
<ul style="list-style-type: none"> • There is no institutional unit that accommodates businesses activities 	<ul style="list-style-type: none"> • Formation of community cooperatives
