Integrated Regional Agro-Industry Based Border Area Development in Indonesia

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Abstract
Indonesia is a very large archipelago country which has many border areas with its neighbouring countries. The development of these border areas has lagged behind when compared with other parts of the country. Most of the areas are relatively remote, with no access to markets and limited social and economic facilities. However, they have abundant natural resources (land, forest, mines), social capital (culture, local wisdom), and strategic position (tourism and cross-border trading). To foster development of these regions, special approaches, strategies, and methods are needed. It is necessary to consider the advantage of an integrated regional development strategy based on agro-industry to rationally use resources, optimize and improve local community prosperity, and foster regional economic growth. This paper discusses the advantage of this concept and finishes with some conclusions which underline the strategic approach for necessary border area development.

Keywords: agro-industry, border area, integrated plan, regional development, Indonesia

1. Introduction
Indonesia, the largest archipelago state in the world, has a lot of border areas with its neighbouring countries. Geographically, Indonesia is located between two continents, Asia and Australia, and two oceans, the Pacific and Indian Oceans. Indonesia shares a border with Malaysia (± 2,000 km), Papua New Guinea (± 820 km) and Timor-Leste (± 120 km along the western sector and ± 180 km along the eastern sector). Indonesia has maritime territorial borders with 10 countries; namely, India, Thailand, Malaysia, Singapore, Vietnam, Philippines, Republic of Palau, Papua New Guinea, Timor-Leste, and Australia (Figure 1).

In particular, the length and breadth of these border areas demand attention, management, and specialized and integrated programs. This is reinforced by conditions in these areas which relatively lag behind other parts of the country. The causes for this and their descriptions are as follows:
(1) Social: low population, low levels of education, weak local institutions, rich in culture but underdeveloped, good but threatened sense of nationality,
(2) Economic: stunted, poor, limited markets, subsistence, and
(3) Environment: isolated, disorganized use of natural resources, threat of over-exploitation.

Along with these limitations, the border area has many advantages and opportunities:
(1) The tremendous wealth of natural resources (forests, lands, mines and minerals, fisheries and marine
resources),
(2) The strategic area for national defence and security, and
(3) Most of the natural resources have not been managed and some belong to conservation areas or protected
forests which are considered to be “the lungs of the world” (world heritage) that need maintenance and
protection.

The above situations illustrate that the border area is a region that is relatively underdeveloped, but at the
same time, has the potential to deal with many social, economic and security issues. This has led to a huge gap
with other regions; this may become a national issue (Lotfi et al. 2011). Most problems could be easily solved.
The need to approach the problem and develop opportunities requires an integrated strategy and program (Fürst et
al. 2013). To that end, the following questions need to be considered in order to decide upon an approach and
direction which meet the situation and conditions of the border region:
(1) How to use resources to overcome problems in a way that will alter all dimensions and conditions of the
border area for the better?
(2) What is the best approach toward developing a border area?
(3) Can a regional approach improve the welfare of the people?
(4) Which focus of regional development evokes sovereignty and well-being?

The answers to these questions are elements which form the border area development approach based on
local potential within the context of the Unitary Republic of Indonesia as well as from the perspective of
competition with neighbouring countries. This paper investigates and discusses the ways to set up correct,
expeditious, and powerful strategies for regional development.

2. Integrated Regional-Based Development of Border Area

2.1. Border Area Development Perspective

As a developing country, border region development cannot be implemented simultaneously. Program
development must take into account budget and access constraints. From this perspective, there is a need to
prioritize or develop a queue of the regions. Prioritization needs logical and fair criteria which consider economic,
social, and security issues and threats to nationality. The proposed approach helps to set priorities by comparing
development levels in the bordering regions with next regions of neighbour countries (Table 1). A defensive-
oriented approach to development maintains an equal level with bordering regions of neighbouring countries, in
order to follow their developmental changes.

<table>
<thead>
<tr>
<th>Border area conditions</th>
<th>Approach(^{1})</th>
<th>Priority</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indonesia</td>
<td>Neighbour</td>
<td></td>
</tr>
<tr>
<td>Underdeveloped</td>
<td>Defensive/Supervision</td>
<td>Low</td>
</tr>
<tr>
<td>Developing</td>
<td>Collaborative</td>
<td>Medium</td>
</tr>
<tr>
<td>Developed</td>
<td>Integration/Fast Development (Offensive)</td>
<td>High</td>
</tr>
<tr>
<td>Developing</td>
<td>Maintenance</td>
<td>Low</td>
</tr>
<tr>
<td>Developed</td>
<td>Integration, Collaborative</td>
<td>Medium</td>
</tr>
<tr>
<td>Underdeveloped</td>
<td>Expansion (Progressive)</td>
<td>Low</td>
</tr>
<tr>
<td>Developing</td>
<td>Maintenance (Progressive)</td>
<td>Medium</td>
</tr>
<tr>
<td>Developed</td>
<td>Cooperation (Progressive)</td>
<td>High</td>
</tr>
</tbody>
</table>

\(^{1}\) Each of these approaches is described in the text.

A supervision approach is development that emphasizes border line control and state resources in the
region. This is primarily for empty areas of border regions that have similarities with neighbouring countries. A
collaborative approach is suitable when the neighbouring countries are more developed, but do not pose a social
or economic threat. In this situation, regional development should cooperate with or become a partial region of
more developed neighbouring countries, either as a hinterland, suppliers, or a sub-economic system, supported
with strong bilateral agreements.

An integrative approach is used if there is a huge difference with a more developed neighbouring border
region, so that development integrates with the economic system of the neighbouring countries. This approach
needs strong diplomatic relations and good neighbourhood relations. Conversely, a cooperative approach is better
when both countries have reached a relatively good and balanced level of progress in the region so that
development cooperation is economically and socially better than individual development with a bigger (regional)
market orientation which strengthens regional competitiveness. In both situations, there is a potentially negative
issue which is the possible migration of the population to a more developed region of the neighbouring country
(Skeldon 2008).
A fast development approach is a choice for a region when there are very large differences or inequalities and no harmonious relationship with neighbouring countries. Such a situation needs accelerated development with greatest effort (at all costs) to support the sovereignty and pride (self-actualization) of the citizens. Conversely, if the situation is better than in the border areas of neighbouring countries, there is a need to support the development (maintenance approach) in order to not be controlled by the state of the neighbouring region.

An expansion approach is used when the border region situation is very much more advanced than its neighbours. Involvement of the neighbouring region as a sub-system of economic and social development is a rational choice; for example, using them as a supplier of raw material, labour and sub-market. In the case of more advanced development or lagging development but availability of huge resources and market opportunity, then the development choice should be the progressive approach in order to utilize every available opportunity.

Each of these options must consider a scale of development that will give effect to the improvement of well-being. Welfare-oriented development involves many dimensions and aspects that involve economies of scale and technical appropriateness, so that all activities can be more productive, efficient and competitive. A regional approach would fulfill this perspective (Bristow 2005; Waters and Smith 2002).

2.2. Scope of Border Area Development

Border area development components are very broad, diverse and vary according to region or specific location (Weaver 2001). For example, development may include a development focus consisting of economic expansion, regional development, as well as community development and empowerment (Figure 2). These development dimensions are discussed by Newman (2006), as are the expansion of the economy and community empowerment. All dimensions must be considered in border area development, including environmental dimensions (Kremen 2005).

![Figure 2. Connection and focus of border region development (based on Porter et al. 1999)](image)

Figure 2 illustrates the complexity and comprehensive detail required in border region development with a focus on a particular policy. Regional development with a high level of complexity requires an approach, model, and spatial plan that allow the wise use of resources to enhance the ideal development of the region (Trippp 2010). Economic expansion is not merely an addition or opening of business units, but it must involve many stakeholders, cover many aspects, and meet many goals. Similarly, community empowerment is not only used to increase skills and knowledge, but should be accompanied by an adequate support system (Gosnell and Abrams 2011).

From the description above, the Border Area Development (i) must be implemented with a single integrated regional-based plan, (ii) should be multi-dimensional and multi-sectoral to ensure regional growth that improves community welfare, and (iii) must be implemented comprehensively and harmoniously. This perspective requires integrated planning as an important and major component (Figure 3).

An integrated plan entails solving problems in the border region by means of the structured and rational use of natural resources, as well as improving conditions of underdevelopment and stunted growth, changing the area into a modern civil society (Breitung 2002). As part of an integrated approach, the plan must consider the development perspective (making the border as the front veranda and removing sectoral approach), build strong determination (the border territories are entitled to development), and there must be consistency and harmony between planning and execution.
2.3. Region Delineation

A region can be defined objectively or subjectively, depending on the purpose and context of use (Prys 2010). The subjective view uses an abstraction, idea or model to represent the region. A model or abstraction is used to study (part of) the earth's surface with a distinction between one unit and the next. In contrast, the objective view defines the region as part of a reality, as a natural area. In general, natural areas can be based on the configuration, climate, vegetation, and population density (Glasson 1992; Glasson and Marshall 2007).

Much earlier, Misra (1969) used the region as a geographical unit or a reality with boundaries and bonds. Therefore, the region can be homogeneous, nodal (areas with activity centres), or ad hoc. Homogeneous regions are based on the similarity of the dominant attribute. Similarity factors include a single feature (natural, economic, cultural, etc.) or compound (resource planning region, etc.). Glasson (1992) named the second group a formal region which was mainly characterized by the physical size (topography, climate, vegetation).

In the border context, regional delineation considerations (boundary and width) include resource availability as well as adequate economic and technical scale to build an economic system (Huskey and Morehouse 1992; Perkins et al. 2012). Therefore, the delineation depends on the analysis of the resource availability (type, amount and distribution), economic analysis, government support ability, and the chosen development strategies (Figure 4). Thus, the area designation relies on the potential and opportunities, as well as the government's ability to exploit these. BNPP (2011b) determined that a sub-district administration as the smallest area to be a prioritized location.

Figure 4 shows a systematic framework of thinking which suggests that the border area development should consider the economic feasibility, availability of resources, strategic approach, and need for government support. Sustained remoteness and underdevelopment of the area is due to negligence of the thinking framework.
2.4. Integrated Regional Development

Many definitions and understandings of regional development lead to efforts which involve using all the potential as a rational basis for establishing areas that advance the public welfare. From this perspective, a rational effort is to increase the regional resource capacity in all aspects and dimensions, namely natural resources (natural capital), human resources (human capital), artificial resources (man-made capital such as infrastructure), and social resources (social capital; Fawn 2009). Such an approach can be interpreted as sustainable community empowerment (UNDP 2011).

Border issues are complex, diverse, and vary from one region to another (Hameiri and Jayasuriya 2011). Complexity requires an integrated approach while differences need specific approaches. From the regional point of view, complex problems and goals will involve many agencies and ministries with different scopes of the main tasks and which may even conflict with each other (Marston 2011). Therefore, the regional-based development of border areas should be holistic and integrated at the plan level and coordinated (harmoniously) at the implementation level (Bekker and van Venrooy 2005).

Integrated regional development has many benefits that can accelerate program implementation to meet the border region development goals. The benefits include (i) lower transaction costs, (ii) adequate market expansion, (iii) optimal resource use, (iv) economies of scale in production, (v) more efficient allocation of resources, (vi) ways to overcome the constraints of small-scale economies toward industrial efficiency, (vii) practical ways to cut the cost of fragmentation of regional markets, (viii) support to attract investment, and (ix) application of outside technology, in particular to boost economies of scale. It can also be viewed, in the long-term perspective, as a multiplication of the added value of government investment (allocation of funds; Bachtler and Taylor 2003). Thus, to some extent, the development of integrated areas has similarities with an integrated rural development at different scales (Nemes 2005).

2.5. Dimension and Direction of Border Regional-Based Development

The border area development goal is to build a civil society that is economically prosperous, socially equal, and enables safe living (removed from criminal interference, external pressure, disasters, etc.). Therefore, the dimensions of development at the very least should include economy (productive, efficient, competitive, regional-based) and social issues (education, health, norms, narrowing the gap). Above all, it is important to secure border lines and areas in order to avoid conflicts and threats both from outside and from inside (Figure 5).

Based on orientation, goals and dimensions, the main programs of border regional development are: (i) settlement of boundary disputes through diplomatic relations and bilateral agreements, (ii) expansion of the economy, (iii) settlement development, and (iv) comprehensive community empowerment. These are all united in the regional integrated and sustainable development plan (Schiff and Winters 2003).

The basis of economic expansion, regional development, and community empowerment is local resources (natural, human and artificial; Marinetto 2003; Sneddona and Foxa 2012). The intention on a regional basis is to meet or even exceed the technical and economic scale of the business units either as individuals, groups or companies. Businesses with economic scale will be very productive, efficient, and competitive, producing large volumes and good quality. Most production is not consumed at the local level (due to the limited number of people), so there needs to be a regional and export market orientation (Figure 6).
The design of resource assessment, development of infrastructure, establishment of supporting institutions and economic business units is based on an actual study (feasibility, design and assessment; Rietveld and Stough 2004). The intention is to make sure that goals and aims are achieved through proper and accountable development programs. Special attention is given to activities that indirectly create a positive impact on the region and benefit to its people such as tourism, research, and the protection of forests and nature (Mercado 2002). Infrastructure development should be oriented and aligned with neighbouring countries (cross-border) and needs attention as part of market development (Dörry and Decoville 2012). This openness can be utilized in such a way that it becomes a powerfully motivating factor for the region’s development (Niebuhr and Stiller 2001) with useful synergy.

3. Agro-industry Based Development

The above analysis and approach are intended to ensure that the border area development implementation should fulfil the economic, technical and social criteria, with special consideration of the relative position with the neighbouring countries. The wide development choice and focus make it possible to find the most suitable approach. The choice is directed by the need to meet the economic and technical scales of development, in order to integrate upstream and downstream development and optimizing synergistic benefits (Bagoulla et al. 2010). The basis of development is local resources in all their forms; those are, natural resources, human resources, and strategic position. In the context of natural resources, the greatest benefits are derived not only from exploitation (primary) but, more importantly, also from added value formation through the establishment of processing (secondary and tertiary) activities. For the agricultural sector, the main value adding activity is agro-industry. The area will develop into a centre of production and processing industry that will be more competitive in many dimensions because it is more productive and efficient (Brocks and Schulitz, 2006; Castle, 2002).

Agro-industry is an agriculture (-based) industry, including agricultural product processing industries and supporting services. The industry covers: (i) processing of food crop products, (ii) estate crop products processing, (iii) fishery products processing, (iv) livestock product processing, (v) forestry product processing, (vi) equipment and agricultural machinery manufacturing, and (vii) support services. This integrated approach encourages establishing priorities together with supporting sectors, optimizing development and strengthening linkages with upstream-downstream networks in the border region (Vesala and Vesala 2010). Value-based development will strengthen the economic and food self-sufficiency of local communities (Bantacut 2013).

The agro-industry complements the agricultural system by assembling all components into one powerful entity. This means that the agro-industry development has forward linkages to meet market demand by strengthening the downstream industry (Foster and Rosenzweig, 2003) and backward linkages to add value to agricultural products. Development integration through agro-industry has a large scope, ranging from strengthening agricultural markets to added value and competitiveness creation of agricultural commodities (Figure 7) (see also Harriss 1992; Haggblade et al. 2001; Reardon et al. 2000).
Agro-industrialization is a way to break the vicious circle of poverty in the underdeveloped border region. The core of these efforts is to move from subsistence and traditionally structured to more modern and commercial agriculture. This means that regional development is not handcuffed to agricultural productivity and income improvement, but it is attributed to the creation of added value through the growth of small, medium (SMEs) or large enterprises based on local natural resources, communities and institutions (Asian Development Bank 2000; Hess et al. 2002; Rehber 1998). In turn, a productive area becomes a growth centre (Gren 2003) which is followed by population growth, increased housing, and improved social facilities and economic means. Optimum agriculture-based development will push, pull or lift other sectors to form a strong economic region (Margarian 2012).

Bantacut (2013) illustrates that activity concentration in rural agro-industry would optimize the added value acquisition by local communities. The acquisition includes the added value and labour cost. The resources-based processing sector development addresses employment opportunity scarcity for the local workforce. Therefore, agro-industry development should focus on local conditions, raw materials and human resources.

Assume that there is an agricultural village which has 500 hectares of cassava plantation area and a productivity of 30 tons/ha per year with a population of 1000 people. Total cassava production is 15,000 tons/year. The local people consume fresh cassava as a staple food at 240 kg/person per year (Bantacut, 2010) or 240 tons per 1000 population. There are about 14,760 tons of raw materials available for the processing industry. Based on the calculation and financial analysis of added value, the potential of economic and social benefit of cassava processing activity is promising (Table 2). Product choice depends on many factors such as market and availability of water, electricity and labour. In the case of cassava processing into flour, the value will be around Rp.11 billion, or an average of Rp. 11 million per head per year. At the same time, there are about 11,808 man-month employment opportunities (25 working days/month) or the equivalent of 1,000 people working full-time in a year. This means that this village needs more labour than currently available to work in the cassava flour industry.

Total available labour cost is Rp. 7.38 billion for labour wage payment. Through increased productivity of labour and the use of machinery and equipment, the number of labourers decreases to a quarter of the labour force, so the potential labour income is Rp. 2–3 million per month. This illustration demonstrates that integrated production and processing support villages’ economic and food independence based on the creation of added value such as the processing of cassava into flour. This option is available for other commodities and processed products.

<table>
<thead>
<tr>
<th>Product</th>
<th>Added Value (million rupiah)</th>
<th>Employment (man-day)</th>
<th>Labour cost (million rupiah)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dried cassava</td>
<td>2,952</td>
<td>59,040</td>
<td>1,476</td>
</tr>
<tr>
<td>Tapioca</td>
<td>21,992</td>
<td>11,808</td>
<td>295</td>
</tr>
<tr>
<td>Dried chip</td>
<td>9,667</td>
<td>103,320</td>
<td>3,099</td>
</tr>
<tr>
<td>Cassava flour</td>
<td>11,439</td>
<td>295,200</td>
<td>7,380</td>
</tr>
</tbody>
</table>

Source: Bantacut (2013)

Note: Exchange rate is always changing, but it is around Rp. 13,000 for US $1.

4. Agro-industrial Institution
In many situations, people/farmers are always at a disadvantage when they are in the position of a supplier of raw materials for agro-industry (Foster and Rosenzweig 2003). In fact, many industrial businesses depend or rely on
their commodities. Entrepreneurs, of course, prefer to maximize the advantages rather than other considerations in building their business. Very often, they obtain the profit at the disadvantage of farmers (Burton *et al.* 2006). Therefore, before the conventional rural components grow (small farmers and entrepreneurs), it is necessary for the government to set up a rural industrial institution consisting of all stakeholders (Bantacut *et al.* 2003). It is also important to regulate improvement of the communities and institutions’ capacity to make sure that the community gains rational socio-economic benefits (Massuanganhe 2008).

Farmers acting as an official supplier (contractor) or shareholder of industry need a representative system so that working relationships become more simple and focused. Farmers are organized into farmer groups (FGs). Depending on the number, several FGs could be organized into a Farmers’ Group Association (FGA) which represents farmers in the working relationship with the industry. The number of farmers involved is determined by the industrial scale and the amount of raw materials required (Figure 8).

![Diagram](https://example.com/diagram8.png)

**Figure 8. Farmers’ Organizing in Farmer Group or Farmer Group Association**

From an institutional perspective, FG is the smallest organizational unit and it is the first (primary) group level in agricultural satellites. FGAs have greater strength as the basis for agro-industry development and this is the second (secondary) group of agricultural satellites. In further developments, FGAs can join together to form a larger group and a strong basis for the development of the downstream agro-industries (Seitanidi and Ryan 2007).

FG is the representative body of individual farmers which submits program proposals, aspirations, and overall financing. FGA leaders are elected from and by the members, using certain agreed rules and collective agreements. At this level, all farmers’ proposals combine to become the FG program. Incentives or government help to farmers is organized at the level of FG in order to avoid the hassle of administration and the flow of funds/information. Nevertheless, the flow of aid and all such information should be administered at an FGA level through the FG Chairman (Milicevic *et al.* 1999).

Based on the ideas and concepts above, agro-industry development should consider the following orientations:

(i) to process local resources (agricultural products),
(ii) the products should have regional or export markets,
(iii) resources should be owned by farmers who are producers of raw materials or at least supported by a formal institutional relationship (economic and ownership) between farmers and agro-industry,
(iv) to strengthen the position/ownership of the farmers, the government should provide financial support (investment, working capital) and training for agro-industry,
(v) government should play an active role or give help to strengthen the agro-industry in all dimensions until they are able to grow and become independent, and
(vi) the added value formed in agro-industry should be properly distributed, at least in the form of a guaranteed market of agricultural products.

5. Conclusion

The border area is the front veranda of Indonesia, so it needs the right rules and direction for its development. In order for the area to be competitive or at least to be able to grow and develop independently, the development should: (i) be based on local potential, (ii) meet the required technical and economic scale, (iii) be a centre of added value based on production and processing industries, and (iv) have a regional/export oriented market. The core of development for land/agricultural resources is agro-industry which will optimize the creation and acquisition of added value in the region.
To foster development, each border prioritized area should have a single integrated and consolidated regional-based plan. This plan is important as the basis of rational use of natural resources in solving problems and to change underdeveloped and stunted conditions into a more developed civil society.

Agro-industrialization of border areas is a vehicle to build the welfare of farmers through optimum added value extraction. When the business scale meets the technical and economic criteria, then there is no choice but to strengthen all aspects, dimensions and levels of the region. In this context, the development of agro-industry in line with farmer production (local potential), involving farmers in business ownership, creates healthy institutional relationships, and facilitates access to business development factors.

A development orientation would improve farmers' income, job creation, and economic growth in the region. This needs reinforcement through a variety of efforts ranging from restructuring the financing policies to the strengthening of the market and technology. Agro-industry will grow and profit the local community if its development is based on using local resources to maximize the added value accumulation in the agricultural production area. In this way, agro-industry development is expected to accelerate economic growth in the border region.

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