

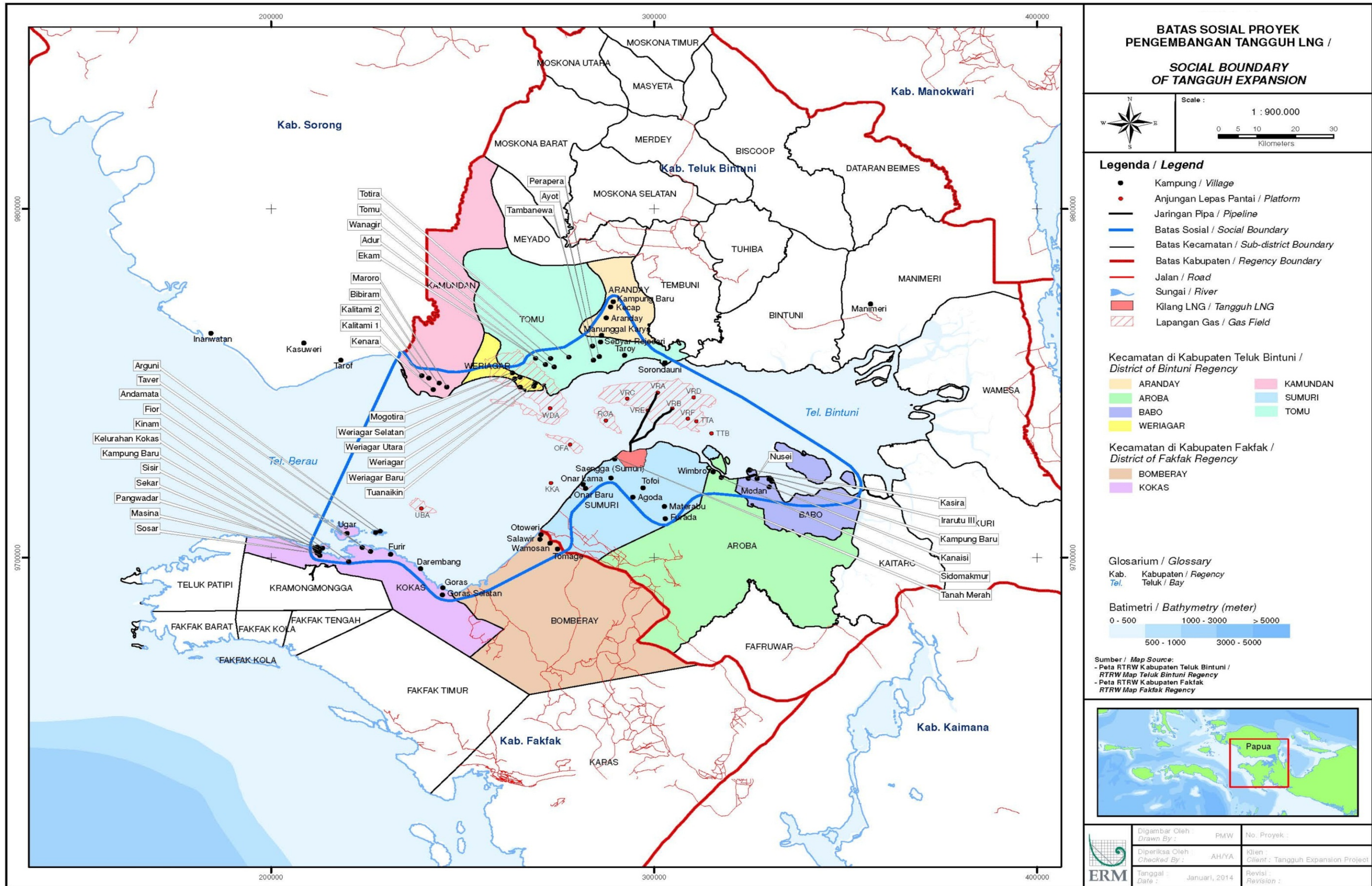
2.3 SOCIO-ECONOMIC AND CULTURAL

The administrative area description of Tangguh LNG has changed if compared to the previous environmental baseline at the beginning of the Tangguh LNG Expansion Project. Environmental and Social Impact Assessment/ESIA (AMDAL) of 1st and 2nd LNG Plant of the Tangguh LNG Expansion Project in 2000-2002 consisted of three studies areas are Manokwari, Fakfak, and Sorong Regencies. Socio-economic and cultural studies related to Tangguh LNG area and most villages in north and south shore of Bintuni Bay, are incorporated to Manokwari Regency. While socio-economic and culture as well as environmental baseline related to AMDAL of the Tangguh LNG Expansion Project is focused on Teluk Bintuni (Bintuni Bay) and Fakfak Regencies.

The change of administrative area focus is influenced by regency expansion. Based on Republic of Indonesia Constitution, No. 26 of 2002 on the Establishment of Regency Expansion in Papua Province stated that Teluk Bintuni was a new regency established to replace Manokwari Regency as well as the establishment of Teluk Wondama (Wondama Bay) Regency as the expansion of Manokwari Regency. Major activities of the Tangguh LNG Expansion Project are conducted at Teluk Bintuni Regency, However, several impacts on activities and expansion of Tangguh LNG also reach some areas of Fakfak Regency. Consequently, socio-economic, cultural and environmental baseline studies for AMDAL Tangguh LNG Expansion Project focused on Bintuni Bay and Fakfak Regency as described on social boundaries maps of the Tangguh LNG Expansion Project.

The aforementioned map indicates social boundaries surveyed on ANDAL Tangguh LNG Expansion document that refers to administrative boundary of district where community lives in. Thus, the surveyed area in Teluk Bintuni Regency consists of Weriagar, Tomu, Babo, Aranday, Aroba, Sumuri and Kamundan Districts, while Kokas and Bomberay are both surveyed in Fakfak.

The socio-environmental baseline in the areas above, has undergone a change due to socio-economic and political conditions in the last ten years. Tangguh LNG presence through social programs and the establishment of Teluk Bintuni Regency to be new regency, predicted to deliver major contribution for either village or regency development of the region.



Map II-20 Social Boundary of the Tangguh LNG Expansion Project

As part of AMDAL Integrated Activity Tangguh LNG commitment in 2002, Tangguh LNG continues supporting operations program in the form of community investments called as Indigenous People Development Plan (IPDP) or well-known as the Integrated Social Program (ISP). The general purpose of ISP is "to support local efforts to improve the quality of life of local people through participatory and accountability of local development practices, and contributes to the sustainability of Tangguh LNG operations". This general purpose is made by recognizing the role of Tangguh LNG as one of many local stakeholders, and its development activities will be influenced by participation and cooperation with other parties. Focus region of ISP is not only limited to Teluk Bintuni Regency but also including Fakfak, both located in West Papua Province.

Public Health Program

In the last five years, local people have experienced a marked improvement in terms of access and health services, along with declining number of disease and other health problems. Some initiatives such as malaria and diarrhea prevention have caused a significant decline in the number of people with the disease. Local health department has worked closely with Tangguh LNG in the implementation of health programs and adopted several initiatives to be applied by government.

Although ISP Program in 2006-2011 has been delivered to local people, many constraints on health problems still appear mostly related to cultural thought and traditions by local community. Big effort is required to overcome this problem, particularly on delivering and convincing local people regarding appropriate knowledge of health against their culture and traditions.

Public health also encounters another constraint related to the quality of primary healthcare services, including Puskesmas (Community Health Centre), Posyandu (Integrated Health Center), Posbumil (Mother Center), and others. The roles of those healthcare service centers are very important and strategic since they are at the forefront of public health quality improvement. Ensuring the sustainability of healthcare service centers and its service also become public health concerns. The following public health programs supported by Tangguh LNG:

1. The prevalence rate of malaria in DAVs has decreased from 23% in 2003, to 0.08% in 2013.
2. Mortality level on diarrhea in the villages surrounding Tangguh LNG Operation site decreased from 4.7% in 2006 to 1.6% in 2013.
3. Infant mortality rate fell from 13.5% in 2006 to 2.7% in 2011.

Basic Education and Training Programs

For education program, the AMDAL document has three main messages. First, education and training activities provided through existing institutions in Papua. Second, the program activities will be developed in partnership with governments, existing institutions, and a reliable partner. Third, it will combine the activities and

input method for developing existing institutions so as to provide basic educational services, and for providing vocational education aimed at a wider Papuan.

Basic Education and Training program aim to contribute to educated and skilled community development. Educated people are defined as population which is able to access education and aware of the benefits of better education. Skilled local people are defined as people who have skills to diversify their livelihood and increase their family income. The programs that have been implemented, including:

1. Opportunity to 116 apprentices (divided into 7 groups) working at Tangguh LNG Plant facilities.
2. Development of Flagship School for junior high school in Tanah Merah Village.
3. Improvement in school enrollment at all levels of elementary, junior high and high school.
4. Implementation of teacher training for 953 teachers with purpose to increase the capacity of teaching-learning process in schools.
5. Increasing the graduation rates of students from elementary, junior, and senior high school up to 90%.
6. Mentoring 149 schools in terms of management school.
7. Figures of reading and writing skills in DAVs increased from 77.6% in 2007 to 83.9% in 2011.

Workforce Management Program

AMDAL Integrated Activity Tangguh LNG commitment in 2002 has stipulated a commitment about workforce priority generally for Papuan and particularly for DAVs to work on Tangguh LNG Plant. It has also mentioned that 85% workforce in the Tangguh LNG is targeted from Papua. The following achievements have been obtained to date:

1. In the construction phase, Tangguh LNG has hired 10,920 employees at the peak of employment, that consisted of 32.24% come from Papua and 7.01% come from DAVs.
2. At the operation phase as many as 1,411 people or 53.2% of the workforce in Tangguh LNG comes from Papua (based on data of workforce in December, 2013), in which as many as 72 people from Papua work at the level of supervisor / manager in Tangguh LNG.
3. Vocational training program in the field of carpentry, wood, steel and electricity as well as administration has been delivered to DAVs community before construction began in 2003. These vocational training were in collaboration with BLK (Development Training Center) Sorong, Jayapura and VEDC Malang.
4. Development of BLK in Aranday was aimed to provide opportunities for community from Bintuni Bay region and its surrounding to improve capabilities in the field of vocational technical. Operational of the BLK now has been handed over to the Local Government of Teluk Bintuni Regency.

Livelihood Program

Livelihood Program involved many local people activities undertaken to meet their daily needs and generate income. This program also organized a number of training to diversify agricultural and fishery products from local fishermen, assist on repairing their own fishing gear, and support manufacture organizations. Income-generating activities of local community embodies primary sector activities related to agriculture and fisheries, secondary sectors such as industrial and small-scale production, and the third sectors such as trading and other professional services. Family income for local people would be obtained from a variety of sources to meet any household needs. It is expected that women have greater role in family income-generating activities so that they can give more voice dealing with decision-making process, both in the family and society. The programs that have been implemented, including:

1. Agricultural training and mentoring programs for the community.
2. Absorption of vegetable, fruit, salted fish and post-harvest products by Tangguh LNG catering and market in Bintuni Township and Babo.
3. Since 2008 have been more than 1,272 tons of fruits, vegetables, fish, crabs, and shrimp are supplied to Tangguh LNG catering (based on data of 2013), which is equivalent to 27.2 billion rupiahs.
4. Establishment of Joint Savings and Loans (UBSP) in several villages DAVs.
5. Increased household income amounted to 166% through 2012.

Bird's Head Business Empowerment of Papua (BHBEP)

Bird's Head Business Empowerment of Papua aims to improve the capacity of business people in the Bird's Head Region of Papua. Tangguh LNG also accesses opportunity for local businesses to be a contractor in Tangguh LNG. Business empowerment programs that have been implemented including:

1. Business training to local companies in West Papua. Since 2006, Tangguh LNG has conducted 64 training sessions, followed by participants from 527 companies. Of the 551 participants, 239 Indigenous People*.
2. Mentoring on fields of management, administration, business continuation, and organizations for local companies in West Papua. Since 2006, Tangguh LNG has conducted 2,726 mentoring sessions which are participated by 177 companies.
3. Until the year 2013, there have been 90 contracts from 22 local companies, with a contract value of 112 million U.S. dollars, as the contractor of Tangguh LNG.

Governance Program

In accordance with the approach to encourage partnership with local stakeholders, the governance program covers both local government and civil society. This program intends to encourage the institutions establishment for local organization, in order to be capable in providing an efficient environment for other development

agendas. Governance program will also facilitate behavior change among key stakeholders, so that they can engage constructively in the process of regional development. During the passage of Governance Program, since 2011 to present, many achievements have been obtained including:

1. Increased public services in districts and Directly Affected Villages (DAVs).
2. Increased understanding of stakeholders in Bintuni Bay area about Revenue Sharing (DBH) of oil and gas industry.
3. Increased women and youth capacity in villages surrounding Tangguh LNG operation site.
4. Increased the capacity in development planning, through PBM (Participatory Planning) programs.
5. Establishment of effective security condition in the villages of Area Surrounding Tangguh LNG Operation site through Integrated Community Based Security (ICBS) program.
6. Training and mentoring on local government officials functions and responsibilities (*tupoksi*), strategic planning, budgeting, and reporting at the level of villages, districts, and regencies. A total of 724 government officials have been trained during the year 2013, of which 196 of them are women.
7. Strengthening the capacity of NGOs through development of local NGOs and training, cooperation with LP3BH (Institute of Research, Assessment, and Development of Legal Aid). Until the year 2013, there are 34 NGOs in the Bird's Head region have been participated.

Communication and External Relation Program

Some challenges related to relationship maintenance with various stakeholders need to be managed. One such challenge is to build sustainable communication, particularly with the local community, through existing mechanisms and media. Another challenge is to develop existing relationships to be more constructive in which local community work together with Tangguh LNG to support stable operation and maximize the benefits of the presence of Tangguh LNG. It is recognized that local cultural values play an important role in building mutual respect and constructive relationships. Although only a few institutions put interest at local cultural values, Tangguh LNG believes that the influence of local cultural values are useful and needed to be strengthened. To build constructive relationships with stakeholders, Tangguh LNG has contributed in a variety of communication and external affairs programs, including:

1. Establishment of good relationships between Tangguh LNG, community of Teluk Bintuni, and other stakeholders, including the Local Government and the media.
2. Tangguh LNG activity progress reports through News from the Bay (KaDaTe) that is distributed to the villages around Tangguh LNG.

3. Supporting the establishment and operation of YPTB (Bintuni Bay Development Foundation) in infrastructure development in Teluk Bintuni Regency.

Socio-Environmental Baseline written on this document has considered the contribution of Tangguh LNG development in directly affected villages (DAVs). The baseline study will include data and demographic parameters, economic, socio-cultural, educational, and community health associated to the aforementioned areas.

2.3.1 Social-Economic

2.3.1.1 Teluk Bintuni Regency

- **Demographic and General Overview**

Teluk Bintuni Regency was officially established in 2002 with the enactment of Law Number 26 of 2002 concerning the establishment of a new district in West Papua province. Teluk Bintuni Regency consists of 24 districts with two sub-districts and 115 villages determined based on Regional Regulation Number 3 of 2007 on the Establishment of Districts in Teluk Bintuni Regency.

Teluk Bintuni Regency has a total area of 18,637 km², or 13.02% of the total area of West Papua province. The number of density as a whole is 2.91 inhabitants per km². The most populated district is Bintuni Township by 46.66 inhabitants per km². Although Sumuri District has the largest area in this regency, it only reaches the second-highest rate of population distribution after Bintuni Township.

Surveyed districts of ANDAL studies area are part of selected villages in Weriagar, Tomu, Babo, Aroba, Aranday, Sumuri, and Kamundan Districts.

Total Population

Total population of Teluk Bintuni Regency in 2010 was 52,422 inhabitants (the Central Bureau of Statistics of Teluk Bintuni Regency, 2011), which consisted of 29,078 males and 23,344 females with a ratio of male and female was 1:25. The residents are concentrated in Bintuni Township with total number of 18,663 inhabitants (35.60% of the total district population), followed by Sumuri District as many as 6,224 people (11.87%) and Manimeri District as 5,208 inhabitants (9.93%). There are 21 other districts in Teluk Bintuni Regency, each having less than 7% of the population number in regency.

Table II-95 Total, Density and Distribution of Population in Teluk Bintuni Regency by Districts (2010)

| No. | Districts | Population (Inhabitants) | | | Total Area (km ²) | Sex Ratio | Population Density (Inhabitants/km ²) | Population Distribution (%) |
|--|-----------------|--------------------------|---------------|---------------|-------------------------------|-------------|---|-----------------------------|
| | | Male | Female | Total | | | | |
| 1 | Farfurwar | 518.00 | 497.00 | 1,015.00 | 1,171.00 | 1.04 | 0.87 | 1.94 |
| 2 | Babo | 1,823.00 | 1,409.00 | 3,232.00 | 687.43 | 1.29 | 811.35 | 6.17 |
| 3 | Sumuri | 3,438.00 | 2,786.00 | 6,224.00 | 1,922.00 | 1.23 | 1.51 | 12.54 |
| 4 | Aroba | 1,920.00 | 972.00 | 2,892.00 | 859.29 | 1.98 | 1.875 | 4.96 |
| 5 | Kaitaro | 400.00 | 350.00 | 750.00 | 859.29 | 1.14 | 1.9194 | 1.44 |
| 6 | Kuri | 496.00 | 456.00 | 952.00 | 1,611.00 | 1.09 | 1.90120 | 1.73 |
| 7 | Idoor | 607.00 | 547.00 | 1154.00 | 816.00 | 1.11 | 1.7545 | 2.20 |
| 8 | Bintuni | 10,637.00 | 8,026.00 | 18,663.00 | 421.75 | 1.33 | 1.8027 | 35.40 |
| 9 | Manimeri | 2,889.00 | 2,319.00 | 5,208.00 | 316.32 | 1.25 | 1.852 | 10.14 |
| 10 | Tuhiba | 331.00 | 282.00 | 613.00 | 263.60 | 1.17 | 2.1411 | 1.17 |
| 11 | Dataran Beimes | 163.00 | 186.00 | 349.00 | 316.32 | 0.88 | 1.76 | 0.66 |
| 12 | Tembuni | 497.00 | 376.00 | 873.00 | 1,326.00 | 1.32 | 2.0686 | 1.67 |
| 13 | Aranday | 510.00 | 545.00 | 1,055.00 | 572.01 | 0.94 | 1.9553 | 2.01 |
| 14 | Tomu | 1,252.00 | 1,196.00 | 2,448.00 | 572.00 | 3.69 | 2.0561 | 1.26 |
| 15 | Kamundan | 321.00 | 339.00 | 660.00 | 572.00 | 0.27 | 1.937 | 4.67 |
| 16 | Weriagar | 682.00 | 639.00 | 1,321.00 | 715.00 | 1.07 | 1.9502 | 2.45 |
| 17 | Moskona Selatan | 261.00 | 248.00 | 509.00 | 929.62 | 1.05 | 1.80370 | 0.97 |
| 18 | Meyado | 591.00 | 475.00 | 1,066.00 | 743.69 | 1.24 | 1.9096 | 2.04 |
| 19 | Moskona Barat | 188.00 | 171.00 | 359.00 | 743.69 | 1.10 | 2.0295 | 0.69 |
| 20 | Merdey | 237.00 | 244.00 | 481.00 | 789.44 | 0.97 | 1,876 | 0.92 |
| 21 | Biscoop | 250.00 | 219.00 | 469.00 | 789.44 | 1.14 | 2.08 | 0.91 |
| 22 | Masyeta | 175.00 | 189.00 | 364.00 | 451.11 | 0.93 | 2,0249 | 0.69 |
| 23 | Moskona Utara | 362.00 | 371.00 | 733.00 | 679.43 | 0.98 | 1,9472 | 1.40 |
| 24 | Moskona Timur | 530.00 | 502.00 | 1,032.00 | 509.57 | 1.06 | 7.98 | 1.97 |
| Total Population of Teluk Bintuni Regency | | 29,078 | 23,344 | 52,752 | 18,065 | 1.25 | 2.81 | 100.00 |

Source : Teluk Bintuni Regency in Figure 2011; Central Bureau of Statistics of Teluk Bintuni Regency, 2011

Since the total area of Bintuni Bay is more less 18,637 km² or (13.02% of the total area of West Papua province), the density number of Bintuni population is largely 2.81 inhabitants per km². Three districts with the greatest population density is Bintuni (44.25 people/ km²), Manimeri (16.46 people/ km²), and Babo (4.70 people/ km²).

Sumuri District has the largest area and the second highest rate of population distribution after Bintuni District. Population number, density and distribution of each district in Teluk Bintuni Regency shown in **Table II-100**.

Population Structure

Table II-101 shows the population structure of Teluk Bintuni Regency by age and sex group. The most populated age group in Teluk Bintuni Regency is in the aged 0-4 years demonstrates 13.45% of age group. Meanwhile, the smallest percentage of age more than 75 years is 0.23%. While the toddler age group (0-4 years), children (5-9 years) and adolescents (10-14 years) commonly reach the most total population which above one of third (or 34.62%) of the total population in Teluk Bintuni Regency.

Table II-96 Total, Density and Distribution of Population in Teluk Bintuni Regency by Age Group and Productivity in 2011

| Age Group | Sex | | Total | % | Productivity Categories |
|--------------|------------------|------------------|------------------|----------------|----------------------------|
| | Male | Female | | | |
| 0-4 | 3,666.00 | 3,498.00 | 7,164.00 | 13.45% | 34.62% (Non-productive) |
| 5-9 | 3,278.00 | 2,858.00 | 6,136.00 | 11.65% | |
| 10-14 | 2,632.00 | 2,493.00 | 5,125.00 | 9.52% | |
| 15-19 | 2,438.00 | 2,208.00 | 4,646.00 | 8.40% | 64.43% (Productive) |
| 20-24 | 2,911.00 | 2,573.00 | 5,484.00 | 10.38% | |
| 25-29 | 3,543.00 | 2,644.00 | 6,187.00 | 11.86% | |
| 30-34 | 3,080.00 | 2,211.00 | 5,291.00 | 9.49% | |
| 35-39 | 2,752.00 | 1,824.00 | 4,576.00 | 8.09% | |
| 40-44 | 1,994.00 | 1,427.00 | 3,421.00 | 6.30% | |
| 45-49 | 1,464.00 | 950.00 | 2,414.00 | 4.27% | |
| 50-54 | 962.00 | 627.00 | 1,589.00 | 2.85% | |
| 55-59 | 615.00 | 371.00 | 986.00 | 1.75% | |
| 60-64 | 369.00 | 227.00 | 596.00 | 1.04% | |
| 65-69 | 168.00 | 101.00 | 269.00 | 0.48% | 0.95 % (Non-productive) |
| 70-74 | 101.00 | 70.00 | 171.00 | 0.24% | |
| 75+ | 80.00 | 59.00 | 139.00 | 0.23% | |
| Total | 30,053.00 | 24,141.00 | 54,194.00 | 100.00% | |

Source : ERM Analysis, 2012 from Teluk Bintuni Regency in Figure, 2012

The above table shows that the population of non-productive age (<14 years and > 64 years) in Teluk Bintuni Regency at a rate of 35.57%, while the population of reproductive age (14-65 years) is 64.43%. The dependency ratio of the population aged between productive and non-productive amounted to 55.22%. This suggests that the non-productive population become a burden of productive population.

The majority of population in Teluk Bintuni Regency are Moslem (46.31%), followed by Christian (37.60%) and Catholic (15.91%).

Table II-97 Age Distribution in Teluk Bintuni and Fakfak Regencies in 2010

| No. | Religion | Percentage of Each Religion in Regency (%) |
|--------------|-----------|--|
| | | Teluk Bintuni |
| 01. | Christian | 37.60 |
| 02. | Islam | 46.31 |
| 03. | Catholic | 15.91 |
| 04. | Hindu | 0.05 |
| 05. | Buddha | 0.11 |
| 06. | Konghucu | 0.01 |
| Total | | 100.00 |

Source : Teluk Bintuni Regency in Figure, 2011, Central Bureau of Statistics of Teluk Bintuni Regency

- **Pattern of Livelihood and Income Level**

West Papua Province, particularly Teluk Bintuni Regency is abundantly and rich in natural resources. Natural resources in this region consist of mineral and energy resources, agriculture, fisheries, and plantations.

Based on labor force survey in 2010, 42% of people in Teluk Bintuni Regency depend on agriculture, hunting, gardening, and fishing, others of 19% in the services sector, 11% trading and 28% others.

- **Local Business Growth**

An increased number of commercial businesses in Teluk Bintuni Regency during 2006 to 2010 have been indicated from the presence of kiosk, shops, food stalls and restaurants. Based on legal status, there are various type of business in Bintuni, including Limited Liability Company (PT), CV (Commanditaire Vennootschap or CV), and cooperatives.

Table II-98 Type of Local Business in Teluk Bintuni Regency

| Type of Business | 2006 | 2007 | 2008 | 2009 | 2010 |
|--------------------|------|------|------|------|------|
| Big Market | - | - | 1 | 1 | 1 |
| Traditional Market | 2 | 3 | 4 | 6 | 6 |
| Shop | 21 | 48 | 57 | 67 | 96 |
| Kiosk | 406 | 509 | 660 | 789 | 937 |
| Food Stall | 31 | 47 | 51 | 58 | 72 |
| Restaurant | 2 | 2 | 3 | 5 | 8 |

Source : Teluk Bintuni Regency in figure, 2011, Central Bureau of Statistics of Teluk Bintuni Regency

Table II-99 Type of Business by Legal Status in Teluk Bintuni Regency

| Type of Business by Legal Status | 2006 | 2007 | 2008 | 2009 | 2010 |
|----------------------------------|------|------|------|------|------|
| Limited Liability Company (PT) | 2 | 17 | 24 | 30 | 15 |
| CV/Firma | 51 | 115 | 202 | 175 | 88 |
| Cooperative | 1 | - | 3 | 3 | 3 |
| Private | - | - | - | - | - |
| 148 | 1 | 5 | 6 | 133 | |

Source : Teluk Bintuni Regency in figure, 2011, Central Bureau of Statistics of Teluk Bintuni Regency

In addition, to regency level, local business growth can be also seen in district level. In fact, several districts and villages began to create small businesses of local community to date.

- **Natural Resources Utilization**

Communities living in Berau Bay still largely depend on natural resources, namely fish. Most of the fishing activity is a traditional fishery, instead of aquaculture activities.

Fishermen in Bintuni Bay are mostly traditional fishermen with \pm 3 km fishing distance from the coastline. Big boats with modern fishing gear are operating in the middle of Bintuni Bay entrance. Major production of fisheries is marine fish, shrimp and crab, with distribution in North and South along the coastal waters of Bintuni Bay.

Based on the Fisheries Survey conducted by Bogor Agricultural University (IPB) in 2007, fishery resources was abundantly represented by Taroy Village, Metro Magarina Village, Weriagar Village, Mogotira Village in the north shore as well as the waters around Babo Island, such as Wimbrow, Tanah Merah-Saengga Village, Onar Village, Otoweri Village at the South Shore of Bintuni Bay.

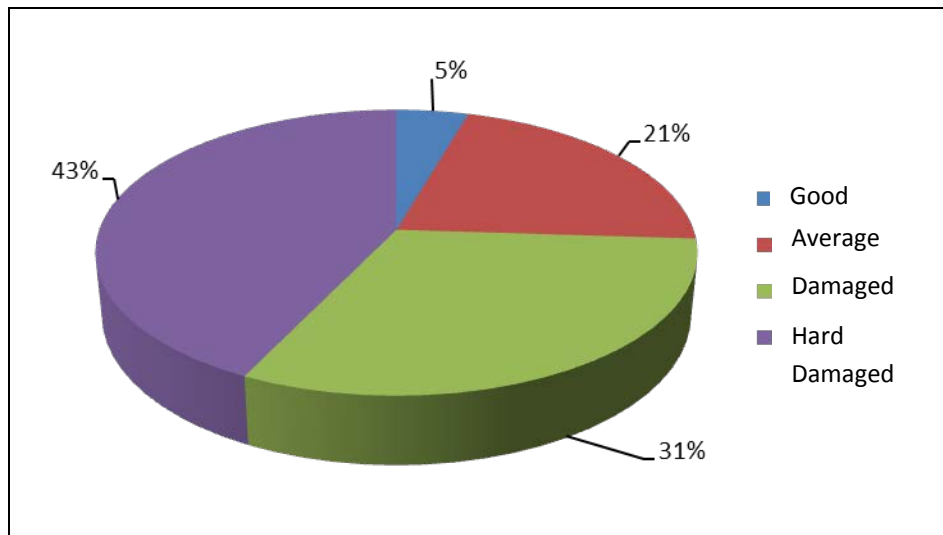
- **Transportation Facilities and Infrastructure**

In general, public land roads in Teluk Bintuni Regency are still insufficient both in quantity and quality. Asphalt road can only be accessed along administrative center of Teluk Bintuni Regency connecting from Bintuni District to Minimeri District. While the remaining road is a connecting road Bintuni and Manokwari which is partially dirt road or unpaved road. Likewise, the connecting road from regency capital to districts region is generally still dirt road. Even most of districts cannot be accessed by land transport and only be reached by sea or river transport, particularly for districts located at the coastal areas of North Shore such as Aranday, Weriagar, Tomu, and Kamundan Districts, as well as the South Shore such as Babo, Aroba, and Sumuri Districts.

Table II-100 Road Condition in Teluk Bintuni Regency

| No. | Road Condition | Distance (km) |
|-----|----------------|---------------|
| 1 | Good | 58,34 |
| 2 | Average | 277,69 |
| 3 | Damaged | 403,40 |
| 4 | Hard Damaged | 553,18 |

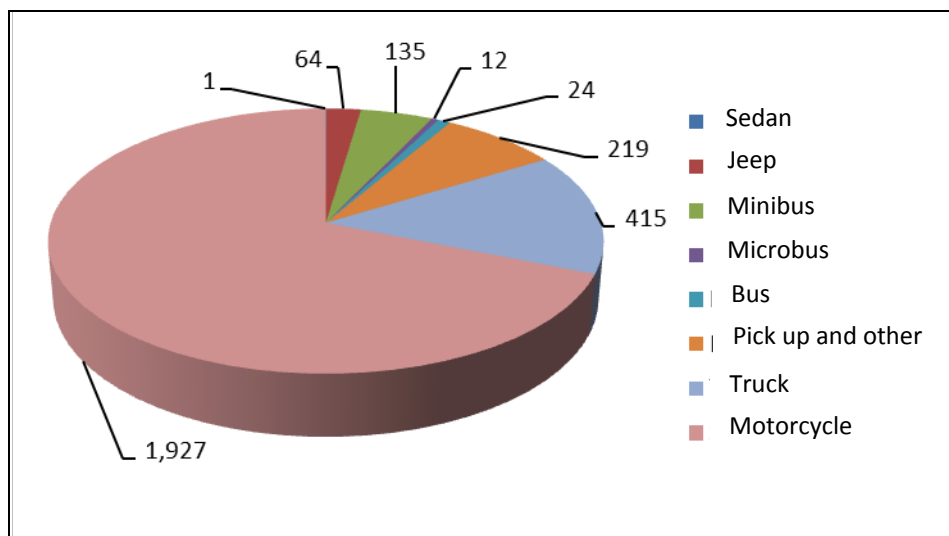
Source : Teluk Bintuni Regency in figure, 2012, Central Bureau of Statistics of Teluk Bintuni Regency



Source : Department of Home Affairs in Teluk Bintuni Regency

Figure II-1875 Public Road Infrastructure in Teluk Bintuni Regency

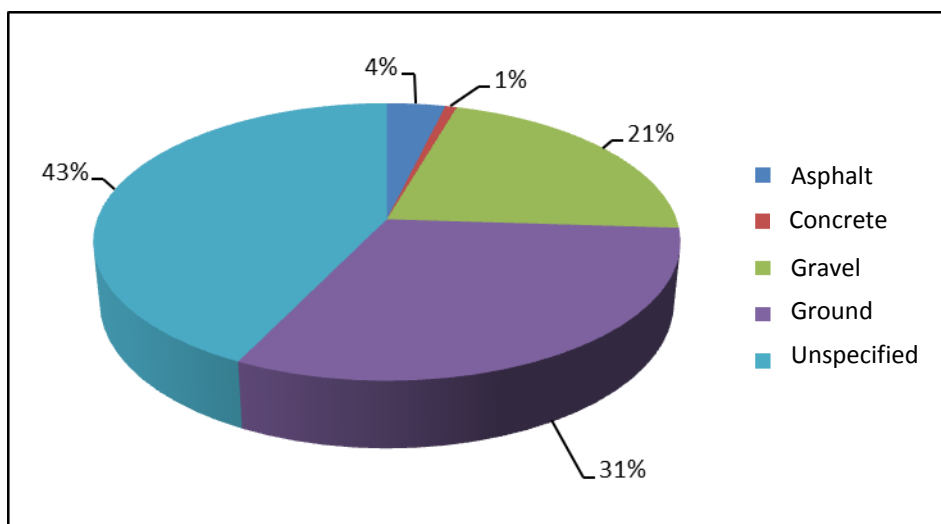
Means of transportation used by local people in Teluk Bintuni Regency include road, sea, and air transports. Public transport is available as a minibus, micro buses, buses and so forth. Description of available number of motor vehicles in Teluk Bintuni Regency as below:



Source : Department of Home Affairs of Teluk Bintuni Regency

Figure II-188 Total of Motor Vehicles Available in Teluk Bintuni Regency

Road facilities and infrastructure can be accessed through state roads and provincial roads with the total length of roads are 1292.60 km in Teluk Bintuni Regency. Of 43% is not clearly described, 31% was dirt road, while 21% in the form of gravel. Details of the roads condition in Teluk Bintuni Regency can be seen in **Figure II-207**:



Source : Department of Home Affairs of Teluk Bintuni Regency

Figure II-189 Road Condition

Sea Transportation

Bintuni Bay region has large water area which is occupied as commercial channel of various types of shipping both domestic or international. Based on data from Bintuni Statistics (2012) as shown in **Table II-106**, the number of various of shipping types visited Bintuni port was consecutively 564 and 787 vessels in 2010 and 2011. Meanwhile, visits of international ships were 73 and 106 vessels in 2010 and 2011. Regular vessel called as *Kapal perintis* serves Sorong-Babo-Bintuni route, or the other way route served by three vessels such as *Kasuari I*, *Kasuari II* and *Fajar Indah*. In addition, there are cargo vessels that carry foods and building materials on large tonnage known by local people as *kapal niaga* and also *kapal opsi* (small cargo vessel about 15 tons).

Table II-101 Total Number of Visits by Shipping Types in Teluk Bintuni Port

| No. | Month | Non Commercial | Nusantara (Domestic) | Perintis (Regular) | Community | Foreign | Total |
|-----|----------|----------------|----------------------|--------------------|-----------|---------|-------|
| 1 | January | 7 | 41 | 2 | 25 | 9 | 84 |
| 2 | February | 3 | 29 | 0 | 20 | 17 | 69 |
| 3 | March | 4 | 40 | 2 | 18 | 19 | 83 |
| 4 | April | 0 | 0 | 0 | 0 | 16 | 16 |
| 5 | May | 10 | 46 | 0 | 19 | 6 | 81 |

| No. | Month | Non Commercial | Nusantara (Domestic) | Perintis (Regular) | Community | Foreign | Total |
|---------------------|-----------|----------------|----------------------|--------------------|------------|------------|------------|
| 6 | June | 4 | 33 | 2 | 31 | 7 | 77 |
| 7 | July | 4 | 59 | 2 | 34 | 1 | 100 |
| 8 | August | 4 | 32 | 2 | 16 | 9 | 63 |
| 9 | September | 3 | 33 | 0 | 20 | 0 | 56 |
| 10 | October | 3 | 38 | 0 | 20 | 9 | 70 |
| 11 | November | 4 | 26 | 1 | 17 | 1 | 49 |
| 12 | December | 1 | 15 | 0 | 11 | 12 | 39 |
| Total (2011) | | 47 | 392 | 11 | 231 | 106 | 787 |
| Total (2010) | | 56 | 272 | 10 | 153 | 73 | 564 |

Source : Teluk Bintuni Regency in Figure 2012.

Local people frequently use sea transportation facilities to travel between villages, administrative area and local economic centers (Bintuni Township, Babo and Kokas). A 2009 studies by PSKK-UGM identified types of sea transport owned by household respondents in Bintuni Bay region such as *sampan*, sail boat/canoe, *ketinting* (long-tail boat), longboat (Table II-107).

Table II-102 Total and Type of Sea Transportation Means Owned by Households in Teluk Bintuni Region

| No. | Village | Total of Households | Total of Households Samples | Type of Means of Sea Transportation | | | |
|-----|------------------|---------------------|-----------------------------|-------------------------------------|-----------------|----------------------------------|----------|
| | | | | <i>Sampan</i> | Canoe/Sail Boat | Long-tail boat/ <i>Ketinting</i> | Longboat |
| 1 | Weriagar | 105 | 30 | 11 | 26 | 16 | - |
| 2 | Mogotira | 81 | 30 | 8 | 13 | - | - |
| 3 | Tomu | 62 | 30 | 11 | 21 | 23 | - |
| 4 | Ekam | 62 | 30 | 14 | 11 | 23 | - |
| 5 | Taroy | 74 | 30 | 10 | 11 | 22 | - |
| 6 | Sebyar Rejosari | 227 | 30 | 5 | 3 | 9 | - |
| 7 | Irarutu III | 448 | 30 | 3 | 3 | 6 | - |
| 8 | Tofoi | 332 | 30 | 6 | 4 | 6 | - |
| 9 | Tanah Merah Baru | 126 | 126 | 11 | 25 | 53 | 3 |
| 10 | Saengga | 126 | 126 | - | 28 | 80 | - |
| 11 | Onar | 73 | 73 | 14 | 26 | 38 | - |
| 12 | Otoweri | 60 | 30 | 6 | 14 | 9 | - |
| 13 | Tomage | 34 | 30 | 7 | 14 | 4 | - |
| 14 | Atibo Manimeri | 53 | 30 | 30 | | | |
| 15 | Mogoi | 43 | 30 | - | -- | - | - |
| 16 | Aroba | 65 | 30 | 12 | 9 | 6 | - |

Source : PSKK UGM, 2009

- **Education**

Several efforts were implemented to improve education quality in Teluk Bintuni Regency. One of the effort done by Local Government is the attempt to bring teacher from Java for several times, communicating a public announcement support to various parties regarding educational infrastructure improvement, cooperating with university in Papua or in other region to work hand in hand in improving education quality program in Teluk Bintuni Regency, and so forth. Since 2002, Tangguh LNG has committed to support education quality improvement, by working with various institutions and organizations in Teluk Bintuni Regency such as British Council besides Local Government of Teluk Bintuni Regency.

The educational improvement program generally covers capacity building of the existing schools infrastructure, and capacity development also availability of good quality of teaching staff. There are at least three institutions besides Tangguh LNG which previously has attempted to improve education in Teluk Bintuni Regency, namely the Catholic Education Development Foundation (YPPK), Christian Education Foundation (YPK), and Muhammadiyah Foundation. These three institutions assist to improve education through of infrastructure improvement, and provision of good quality of teaching staff. The education program mainly focus on 1) strengthening the authority capacity of policymaker and management of educational services; 2) increasing teaching-learning activities; and 3) increasing community awareness in Teluk Bintuni Regency regarding the importance of education. Therefore, to implement those focuses, Tangguh LNG attempts to involve three main actors i.e. educational service officers at district level (includes Department of Education (Diknas), Department of Education, Youth and Sport (Dikpora) dan the existing educational foundations), teaching staff in every levels and parents of student as well as community.

Data of British Council in November 2009 - April 2010 period related to Education program reported that there are 25 classes of six different schools which obtained support on classroom quality improvement. At the same period, Tangguh LNG also provided reading books as many as 2,916 books. Moreover, Tangguh LNG also provided scholarship to selected students to get higher education from junior high school (SMP) to high school (SMA)/vocational school (SMK); particularly for this program, Tangguh LNG has worked together with SMK MIGAS Cepu and SMA 3 Buper in Jayapura. Also Tangguh LNG continuously facilitates mentoring and training for teacher and staffs of regional department of education as well as foundation staffs, in order to strengthen their capacity in delivering good quality of education.

The presence of education program of Tangguh LNG has brought improvements to several aspects of education in Teluk Bintuni Regency. A

significant increase of elementary student attendance rate is from 74.9% in 2007 to 92.3% in 2009. Increased numbers also occur in junior high school students, from 74.2% in 2007 to 93.9% in 2009. On the other hand, the increased numbers of student attendance does not only occur to students, but also teacher attendance in elementary and junior high school. The elementary teacher attendance occurred as data shows a substantial rate of 45.4% in 2007 to 87.4% in 2009. Teacher attendance rate also increase in junior high school presented at 58.6% in 2007 to 91.3% in 2009. Nevertheless, the survey was not conducted on high school because of the limited number of schools in Teluk Bintuni Regency.

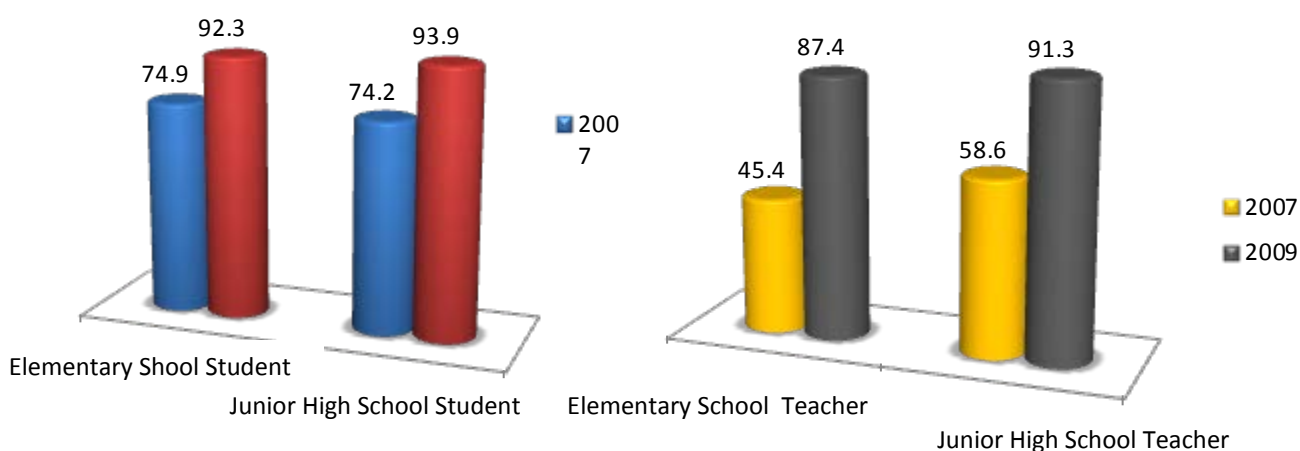


Chart II-190 Comparison of Students and Teachers (Elementary and Junior High School) Attendance in 2007 dan 2009

Education program in Teluk Bintuni Regency is also embodied in model school development activities, conducted in Tanah Merah Village, i.e. SMP YPK Sumuri Tanah Merah.

Education quality can be measured by two indicators namely teacher-student and classroom-student ratios. Teacher-student ratio is a rough comparison number of how many students are ideally accommodated by one teacher.

Nationally, the ideal proportion of teacher-student ratio is determined at 1:20, which means that ideally, each teacher can teach as maximum as 20 students. Fulfillment of teacher’s number appropriate to ratio above is considered giving significant influence on the effectiveness of teaching. Meanwhile, classroom-student ratio is a capacity of ideal number of students who are able to be accommodated by teacher in a classroom. Classroom-student ratio, nationally, is set on ideal proportions of 1:32, which ideally, every single class holds 32 students. This ratio refers to the Technical Directive Regulation of Minister of Education, Minister of State for Administrative Reform and Bureaucratic Reform,

Minister of Home Affairs, Minister of Finance and Minister of Religious Affairs Number 05/X/Pb/2011, Number Spb/03/M.Pan-Rb/10/2011, Number 48 in 2011, Number 158/Pmk.01/2011, Number 11 In 2011, page 45 set:

- Elementary School (SD) 20 at minimum and 28 at maximum students per class
- Junior High School (SMP) 20 at minimum and 32 at maximum students per class
- High School (SMA) 20 at minimum and 32 at maximum students per class
- Vocational School (SMK) 15 at minimum and 32 at maximum students per class

Teacher-student and classroom-student ratios will be put on the education data in the next section, in order to describe current condition of education in community. However, the ratio of teacher-student and classroom-student to measure the capacity and access to educational services cannot be straightforwardly implemented. In this case, the implementation of these indicators should be accompanied with a good understanding of the current condition of community and education in Teluk Bintuni Regency (also applied to Fakfak).

a. Weriagar District

- **Demographic and General Overview**

Weriagar District covers an area of 715 km² of the northern part of Bintuni Bay. This district shares borders with Kamundan District on the west, Tomu District on the east and the waters of Bintuni Bay on the south. Weriagar District is a new district as a result of Aranday District division. It is divided into six villages in which mostly inhabited by Sebyar tribe (as the owner of customary rights) then other tribes.

At the time of survey in 2013, the governance of Weriagar District was recognized by division process that has been running for several years. Formerly in 2001, the Mogotira Village is an integral part of Weriagar Village called Weriagar Mogotira Village. In 2002, when Weriagar District was officially established, the village is divided into Weriagar Village and Mogotira Village. Then, in 2009, Weriagar Village was divided into Weriagar Village (main village), and Weriagar Baru Village and Tuanaikin Village. Meanwhile, Mogotira Village was divided into Mogotira Village (main village), North Weriagar Village, and South Weriagar Village.

Likewise a new district, governance in Weriagar District is managed through institutional strengthening, both at the district and village levels. Governance strengthening in the districts and villages gains support from Tangguh LNG cooperated with PSKK-UGM and Local Government of Teluk Bintuni Regency. This program aims to improve the quality of institutions and personnel

resources in terms of public services. The program was running at the time of survey conducted in the form of mentoring and training including the development of Civil Administration Information System (SIAK), civil registration, strategic planning, governance administration, budget planning districts / villages and *tupoksi* (function and its responsibilities) of village and district officials and *Baperkam* (Village Representative Institutions) members, as well as training to prepare the Development Plan Meeting Team (TPM).



Figure II-191 Villages in Weriagar District

Total of Population

The following table shows the baseline demographic conditions of Weriagar District in 2011. Survey conducted in 2011 showed an increase number of population, while the distribution, sex ratio, and population structure did not change significantly in the past two years.

Table II-103 Total Population in Weriagar District 2011

| No. | Village | Population (Inhabitant) | | | Sex Ratio |
|-----|------------------|-------------------------|--------|-------|-----------|
| | | Male | Female | Total | |
| 1 | Weriagar | 345 | 342 | 687 | 100.8 |
| 2 | Weriagar Baru | 86 | 89 | 175 | 96.6 |
| 3 | Tuanaikin | 38 | 29 | 67 | 131.0 |
| 4 | Mogotira | 258 | 265 | 523 | 97.3 |
| 5 | Weriagar Selatan | 68 | 72 | 140 | 94.4 |
| 6 | Weriagar Utara | 66 | 55 | 121 | 120 |

Source : Survey and Census by UGM, 2011

Despite the division, the data show that the main village (Weriagar) still remains village with the largest population. Yet, there is no data obtained to describe the population distribution. However, it can be estimated that four-year period from 2009 did not affect the population distribution significantly.

Before divided into six villages, Weriar District consists of two villages namely Weriar and Mogotira Villages. Weriar District previously named as Aranday District. Moreover, Weriar and Mogotira Villages considered as a village in AMDAL 2002.

Table II-104 Total Population in Weriar District in the year of 2002, 2009, 2011

| No. | Village | Total Population (Inhabitant) | | |
|-----|----------|-------------------------------|-------------------|-------------------|
| | | 2002 ¹ | 2009 ² | 2011 ³ |
| 1 | Weriagar | 1.781 | 813 | 929 |
| 2 | Mogotira | | 610 | 784 |

Source : 1 AMDAL Tangguh LNG 2002; 2 Social Economic Survey in DAVs by UGM 2009; 3 Census and Survey by PSKK UGM in 2011

Structure of Population

a. Age

The population structures by age divide a population into eight categories of age. This structure is commonly used to formulate policy in the areas of population, social, cultural, and economic. The baseline of existing social condition to describe the population by age as follows:

Table II-105 Population Structure by Age in Weriar District in 2011

| No. | Village | Age Group | | | | | | | | Total |
|-----|------------------|-----------|-------|-------|-------|-------|-------|-------|------|-------|
| | | 0-9 | 10-19 | 20-29 | 30-39 | 40-49 | 50-59 | 60-64 | > 65 | |
| 1 | Weriagar | 260 | 139 | 101 | 95 | 53 | 23 | 6 | 10 | 687 |
| 2 | Weriagar Baru | 64 | 39 | 27 | 21 | 14 | 7 | 1 | 2 | 175 |
| 3 | Tuanaikin | 27 | 10 | 17 | 4 | 3 | 1 | 3 | 2 | 67 |
| 4 | Mogotira | 190 | 111 | 90 | 61 | 40 | 22 | 4 | 5 | 523 |
| 5 | Weriagar Selatan | 50 | 23 | 32 | 17 | 8 | 5 | 0 | 5 | 140 |
| 6 | Weriagar Utara | 48 | 21 | 21 | 16 | 9 | 3 | 0 | 3 | 121 |

Source : Survey and Census by UGM, 2011

As data shown, main village gives 58% of population structure categorized as "young" which is under 20 years old. For new village (after division) shows various numbers which is 52% in South Weriar up to 59% in Weriar Baru for people aged less than 20 years old. Nevertheless, the result number above cannot be determined as a change of population structure based on age due to the division.

b. Religion

Population structure based on religion generally divides total of population into five major religion acclaimed by government. This structure does not count possible variation occurred in two categories either major and local religions.

Table II-106 Population Structure by Religion in Weriagar District in 2011

| No. | Village | Religion | | | | | Total |
|-----|------------------|----------|----------|-----------|-------|--------|-------|
| | | Islam | Catholic | Christian | Hindu | Buddha | |
| 1 | Weriagar | 292 | 297 | 19 | 0 | 0 | 608 |
| 2 | Weriagar Baru | 12 | 86 | 32 | 0 | 0 | 130 |
| 3 | Tuanaikin | 0 | 59 | 2 | 0 | 0 | 61 |
| 4 | Mogotira | 42 | 416 | 27 | 0 | 0 | 485 |
| 5 | Weriagar Selatan | 6 | 90 | 12 | 0 | 0 | 108 |
| 6 | Weriagar Utara | 6 | 84 | 26 | 0 | 0 | 116 |

Source : Survey and Census by UGM, 2011

Pattern of the data above is representative of the history of majors religion spread in Weriagar District, Teluk Bintuni Regency, and even West Papua Province.

- **Pattern of Livelihood and Income Level**

Labor and Livelihood

It was almost no open unemployment found in Weriagar District. All labor force have jobs, although in only subsistence fishing, sago pounding or hunting in the woods. The following table employment and livelihoods in Weriagar District.

Table II-107 Workforce Data in Weriagar District 2011

| No. | Livelihood | Village | | | | | | Total | % |
|--------------|--|------------|---------------|-----------|------------|----------------|------------------|------------|-------------|
| | | Weriagar | Weriagar Baru | Tunaikin | Mogotira | Weriagar Utara | Weriagar Selatan | | |
| 1 | Fishery | 100 | 9 | 5 | 44 | 12 | 13 | 183 | 40% |
| 2 | Gatherer | 20 | 11 | 0 | 29 | 8 | 6 | 74 | 16% |
| 3 | Trading and UKM | 21 | 0 | 1 | 17 | 0 | 1 | 40 | 9% |
| 4 | Tangguh LNG Employee | 27 | 7 | 2 | 31 | 6 | 1 | 74 | 16% |
| 5 | PNS (<i>Civil Servant</i>), Teacher, TNI (military), Polri (Police), Village Officials | 19 | 6 | 5 | 13 | 12 | 16 | 71 | 16% |
| 6 | Labor/Service | 3 | 2 | 0 | 7 | 1 | 1 | 14 | 3% |
| Total | | 190 | 35 | 13 | 141 | 39 | 38 | 456 | 100% |

Source : Survey and Census by UGM, 2011

The table above shows that there is 56% of the existing workforce in Weriagar District working in traditional sectors, namely fisheries by 40% and gatherers (collecting forest products) by 16%. Fishing ground of the fishermen covers from the waters of Magarina to around Siagian trench. In this village is also found people working as employees, mainly working in Tangguh LNG, or civil servants, teachers, military and police.



Figure II-192 *Kebun Para-Para (Farm) in Weriagar District*

Survey and Census in 2011 by PSKK-UGM also showed that most local people have a side job, outside main job. Thus, the side job has become an additional alternative income for communities in Weriagar. Side job for many local mothers is producing salted fish and sago. As for the men work as an employee or government officials, while for side job is catching fish or shrimp in the sea, and carpentry services.

Economic Activities

This district is geographically located far from the center of economic activity of Bintuni Bay, consequently, the economic activity is less developed. Only few kiosks, stalls and shops were found in Weriagar District, and most of these businesses were owned by migrants. Only two kiosks were owned and managed by Indigenous People*.

Since 2002, following the approval of the AMDAL Integrated Activities, Tangguh LNG has launched several economy programs in the village as well as the processing of fisheries yields have been implemented. A number of ± 800 units of shrimp and fishing gear and 60 *ketinting* (long-tail boat) provided to increase the catch of fishermen in 2005. A wood cutting

equipment (chainsaw) as well as a tool grated sago also been provided to community.

In economic capacity improvement, Tangguh LNG has also held several training of Households Economic Training (PERT) and technical training skills to make salted fish for most of women in Weriagar District. Tangguh LNG also supports the establishment of cooperatives, cooperative management and provide training for the community. Tangguh LNG also supports two Joint Savings and Loans (UBSP), namely Weriagar in Weriagar District, and UBSP Nesitapeyo in Mogotira Village.

Tangguh LNG also supports the establishment of Joint Business Group (KUB) of Weriagar in 2012 to manage the stocking point of shrimp and salted fish to be absorbed by catering contractor of Tangguh LNG. Until now, a total of 17.09 tons of shrimp has been absorbed by Tangguh LNG contractors catering to supply employee's food, including absorption of 9.6 tons in 2012. Tangguh LNG also help promotion of salted fish products from Weriagar marketed in Babo and Bintuni Township, and the construction of a unit of KUB house as a business place for shrimp stocking point. Support is also given to the market opening of fishing sales products next to Babo Airport.

Table II-108 Income per Capita of Weriagar District in 2011

| Weriagar District | Income per Capita/Month (Rp) | Household Income/Month (Rp) |
|-------------------|------------------------------|-----------------------------|
| Weriagar | 643.003 | 3,894.739 |
| Weriagar Baru | 718.133 | 3,145.667 |
| Tuanaikin | 618.557 | 3,672.750 |
| Mogotira | 540.276 | 3,550.146 |
| Weriagar Selatan | 685.037 | 2,589.222 |
| Weriagar Utara | 887.292 | 3,655.000 |

Source : Survey and Census by PSKK UGM tahun 2011.

Community Development

Since 2003, Tangguh LNG has run Community Development Program (COMDEV) in Weriagar and Mogotira villages. Along with the division of villages and districts, the funds originally allocated to community development in Weriagar and Mogotira villages, upon the agreement of community members, the development committee and village government decide to allocate partial funds of COMDEV for developing COMDEV program in the entire division villages.



Figure II-193 Focus Group Discussion in Weriagar District

Through the process of Community Action Plans (CAPs), community development committee and community put together a development program and village development, according to needs and priorities. Program priorities include: 1) Infrastructure Development Program; 2) Educational Aid; 3) Health; 4) Women Empowerment; 5) Youth Program; 6) Economic Empowerment Program; 7) Religious and 8) ATK and incentive committee.

Through COMDEV activities, community is able to participate on development planning in accordance with the needs and priorities existed in the village. Furthermore, community is also able to implement and evaluate each of COMDEV program conducted in the village independently.

- **Local Business Growth**

Weriagar District comprises of fishing village with life pattern of coastal communities. The fisheries sector became main livelihoods for local people in this region, although small livelihood activities still exist such as agriculture and plantations, as well as trading, small businesses, and services. Before Tangguh LNG started its operations, small businesses and trading activities have been running in this area. Business sectors such as carpentry sector and transportation has grown and managed by community. Food Security Survey conducted by IPB (Institute of Agriculture in Bogor) in 2010 indicates different types of business products in Weriagar District, particularly in the two main villages; have such as fishery, fishing gear, and agricultural products. Besides commodity products, in Weriagar has also business grown in service sectors such as carpentry and transportation managed by community.

Table II-109 Livelihood Pattern in Weriagar District in 2011

| Type of Business | Weriagar | | Mogotira | |
|------------------|------------------------|--------------------------|------------------------|--------------------------|
| | Commodity Products (%) | Consumption Products (%) | Commodity Products (%) | Consumption Products (%) |
| Farm | 100 | 0 | 91.3 | 8.7 |
| Fishermen | 76.4 | 23.6 | 73.6 | 26.4 |
| Fishery | 0 | 100 | 0 | 100 |
| Agriculture | 0 | 100 | 0 | 100 |

Source : Food Security Survey by IPB, 2010

The small business activities such as kiosk has good business prospect to sell daily needs such as rice, sugar, tea, coffee, cooking oil, kerosene, instant noodles, cigarettes, and so forth. A survey conducted in 2010 did not obtain information about the symptoms, but it can be estimated from the location of business. Kiosk / stall only exist in two main villages i.e. nine kiosks / stalls in Weriagar and six kiosks / stalls in Mogotira. It concludes that high population in these two main villages influence local business development.

- **Natural Resources Utilization**

Natural resources of Weriagar District found in the waters of Bintuni Bay, plantations, especially sago palms. Most of these resources are managed traditionally, with the huge concentration of activity lies on traditional fishery.

Potential fishery in waters of Weriagar District consists of fish, shrimp, crabs and shells. Traditional fishery, with limited equipment, focuses on catching shrimp besides fish, crab and lobster (UNIPA, 2006). In the last 20 years, the traditional fishery in Weriagar District tends to compete with commercial fisheries that use better equipment.

- **Infrastructure and Means of Transportation**

- a. *Weriagar*

Means of transportation owned by Weriagar District community amounted to about 104 *ketinting* (long-tail boat) and 8 longboats. In addition, there is a functioning jetty which is used by local people.

Weriagar village is tidal areas where the land is often flooded by sea water; therefore, its people prefer to build stilt houses to prevent tidal event. Village road was made of wooden planks called as walkway. Up to now, the walkway is still in good condition; only some are decayed exposed to tidal water.

Public facilities in this village, especially education and health, are available but have been inadequate to meet the community needs. Limited facilities affect community to travel to other villages in order to access the facilities. For

example, inadequacy of educational facilities is demonstrated with the absence of Senior High School (SMA). In order to proceed to high school level, students of Weriagar village must go to Sebyar Rejosari village which has more complete educational facilities. Distance and expensive transportation costs (unavailable for daily) between the two villages cause each student have to spend additional cost for staying in a boarding house and consuming daily meals. Weriagar only has a mosque as a place of worship for Moslem, while Christians and Catholics have to go to neighboring village namely Mogotira village due to religious service.

Economic facilities in Weriagar village such as a kiosk / shop provide are available selling various kind of daily needs such as rice, sugar, tea, coffee, cooking oil, kerosene, instant noodles, cigarettes and other necessities. Currently there are four kiosks / stalls in the village owned by migrants.

b. *Weriagar Baru*

Sea transportation widely used by local people is *ketinting* (long-tail boat). Weriagar Baru village has 15 *ketinting* and two longboats. However, the jetty in Weriagar Baru village is in poor condition.

Since this village is located in the swamp area (tidal area), people are difficult to build a house or other infrastructures on the ground. All houses are shaped on stilts, as well as a road used for various purposes made of boards (called as walkway). The plank road conditions currently in pretty good, but there are few exposed by tidal water.

To access place of worship, people have to cross river using a long-tail boat headed to Weriagar or Mogotira villages. Furthermore, community in Weriagar Baru village must go to Weriagar Induk or Mogotira villages to buy daily needs, because they do not have any kiosks or stalls in the village.

c. *Tunaikin*

People in Tunaikin mostly use sea transportation such as *ketinting* or other boats/ships as they travel back and forth the village. There are 15 *ketinting* and two longboats docked in a pretty bad condition of jetty. Tunaikin village road made of wooden planks because of the swamp area location of the village.

Public facilities in the village are very limited, for example, infrastructure related to transportation facilities. Due to the lack of village hall, village official's services meeting held on village head's house. In addition, religious facilities and kiosks or stalls are not yet available in this village. People should go to Weriagar or Mogotira villages to buy their daily necessities.

Similarly, communication facilities in nearly all villages are still not available to capture cell phone signals. Sometimes, signal can be reached in two places only

which is on the riverbank and at the jetty. In case of infrastructure, lighting facilities are not yet exist in this village, thus, lanterns or generators used by people (economically) by for their houses.

d. *Mogotira*

Despite of building a house, other facilities and infrastructures on the ground, local people choose to build it on stilts as a result of tidal area. For village road, walkway is commonly used for various purposes although it is not inadequate condition because of frequently hit by tidal waters.

To support administrative population services, Weriagar District Office and village office are occupied as facilities to many local activities such as village meeting, social activities or cultural meeting. The village office also opens to community whenever they held gathering and activities. The condition of village office is quite simple, made by materials of old wood. In this village there is no village hall or special buildings for traditional meeting so that all customs and other social activities carried out at the village office.

Currently, Weriagar District Office still occupies building in the village administrative area. New building of this district office has been constructed on the South Weriagar, but not yet occupied.

In this village, public facilities particularly on education (kindergarten to junior high school) is good in average. Educational facilities are used collectively with other surrounding villages, such as Weriagar Induk, North Weriagar, South Weriagar, Tuanaikin, and Weriagar Baru villages. In addition, elementary schools are physically in adequate condition, but kindergarten is ion the opposite condition. To date, junior high school still uses one-roof concept (SMP *Satu Atap*/one-roof) of which its infrastructure is still on the same building / below one roof of elementary school.

One of economy trigger in community is the availability of a kiosk / shop that provides a wide range of daily needs. Goods are available in stalls / kiosks such as rice, sugar, tea, coffee, cooking oil, kerosene, instant noodles, cigarettes and other necessities. There are currently six kiosks / stalls in the village owned by immigrant communities.

e. *Weriagar Utara*

The availability of physical facilities becomes an progress indicator of of region. As a newly expanded area, this village still has limited infrastructure. Available road in the village is just a walkway connecting between North Weriagar village with other nearby villages.

Village officials assigned to provide civil administrative services still modest due to the absence of village office, thus, all services are provided at village

head's house. There is a volleyball court commonly used by local people for exercising or playing ground for children.

This village is a new territory; therefore, public facilities such as schools, Puskesmas (Community Health Center), and Posyandu (Integrated Health Center) are not yet built appropriately. To be able to access various kind of facilities, local people use the existing facilities in other villages, namely Mogotira and Weriagar. In addition to economic facilities, such as kiosks / stalls are also not available in the village. In terms of religion, there are three local majority religions, i.e. Catholic, Christian, and Islam. However, local people have to go to other villages in order to access church, mosque, or other places of worship due to the unavailability of those facilities in this village.

f. *Weriagar Selatan*

Local people in South Weriagar are mainly used marine transportation including motorized boat, *ketinting*, and boat. While for land transportation, the village road cannot support due to the wooden planks road which is the only accessible road and still in the state of village development and division). Distance to the other villages can be closely accessed without any transportation or just by walking.

Civil administration services or village activities are still worked at village head's home due to the lack of office facilities or village hall. Although Weriagar District Office has been built spaciously in this village, it has not yet functioned to provide services.

Public facilities, such as schools, Puskesmas (Community Health Centers), and Posyandu (Integrated Health Post), are not yet available in South Weriagar village. In addition to, economic facilities, such as kiosks / stalls, does not also exist in the village similar to religious facilities. Therefore, local people attempt to use public facilities that exist in other villages, namely in Mogotira and Weriagar.

- **Education**

Access to education in Weriagar District is insufficient provided by only having two schools and limited educational capacity that can accommodate community needs for education. PSKK-UGM center of studies has recorded data in 2011 indicating number of schools exists in Weriagar District, namely SD YPPK Weriagar and SMP Satu Atap Weriagar. These schools are still in development. SD YPPK Weriagar only has 6 classrooms, with the total number of students in 2011 as many as 338 students. Thus, it is assumed each class can accommodate approximately 56 students. Implementation of education in SD YPPK Weriagar is supported by seven teachers. It is assumed that every single teacher has responsibility to teach for approximately 48 students.

On the other hand, SMP Satu Atap Weriagar only have 26 students, divided into two classrooms, with a ratio of every single classroom accommodates 13 students. Since the school is still in the progress of development, SMP Satu Atap Weriagar has not yet permanent teacher, otherwise hiring temporary teachers from SD YPPK Weriagar in 2011.

Table II-110 Total number of Schools in Weriagar District in 2011

| No. | School | Total of Students | Classroom | Class-Student Ratio | Total of Teacher | Teacher-Student Ratio |
|-----|------------------------|-------------------|-----------|---------------------|------------------|-----------------------|
| 1 | SD YPPK Weriagar | 338 | 6 | 56.3 | 7 | 48.3 |
| 2 | SMP Satu Atap Weriagar | 26 | 2 | 13 | N/A | N/A |

Source : Survey and Census by UGM, 2011

b. Tomu District

- **Description and General Overview**

Tomu District is divided into ten villages, which consists of main village and division villages. The villages are Ekam (as the main village), Tomu, Taroy and Sebyar Rejosari villages. Ekam Village is divided into two villages namely, Ekam and Totitra. Tomu Village is divided into two villages, namely Tomu and Adur. Taroy Village is divided into four villages, namely Taroy, Tambanewa, Sorondauni, and Perapera. While Sebyar Rejosari Village separated into two villages, namely Sebyar Rejosari and Wanagir. In this village also dwells Sebyar people as the owner of customary law; however, other tribe from Bintuni, Papua or outside Papua also dwells in.

Governance strengthening support in Tomu District is delivered through training and mentoring for district and village officials to strengthen institutional capacity and district as well as village government officials.

The governance mentoring activities carried out by PSKK-UGM including Civil Administration and Information System (SIAK) and civil registration, strategic planning, administration, governance, budget planning on district / village levels as well as *tupoksi* (function and its responsibilities) of village, district, and members of Village Representative Institution (*Baperkam*).



Figure II-194 Villages in Tomu District

Total of Population

The total population of Tomu in 2011 reached 2,794 inhabitants. The least number of population in Tomu District is in Adur Village, while most populated village is Sebyar Rejosari. Sebyar Rejosari Village is a transmigrant village formerly established by Government. Besides as a transmigrant village, it also attracts migrants coming since the presence of a sago palms company in this village. Nevertheless, population is mainly concentrated on main villages which has been expanded.

Table II-111 Total Population in Tomu District in 2011

| Num. | Village | Population (Inhabitant) | | | Sex Ratio |
|------|-----------------|-------------------------|--------|-------|-----------|
| | | Male | Female | Total | |
| 1 | Ekam | 156 | 125 | 281 | 124.8 |
| 2 | Totitra | 31 | 83 | 174 | 37.3 |
| 3 | Tomu | 306 | 277 | 583 | 110.4 |
| 4 | Adur | 7 | 8 | 15 | 87.5 |
| 5 | Taroy | 216 | 209 | 425 | 103.3 |
| 6 | Tambanewa | 54 | 37 | 91 | 145.9 |
| 7 | Sorondauni | 8 | 11 | 19 | 72.7 |
| 8 | Perapera | 63 | 47 | 110 | 134.04 |
| 9 | Sebyar Rejosari | 343 | 349 | 692 | 98.2 |
| 10 | Wanagir | 225 | 179 | 404 | 125.6 |

Source : Survey and Census by UGM, 2011

Population Structure

a. Age

The village resident of Tomu District is generally dominated by young age groups between the age of 0-29 years old especially in Tomu and Taroy. It can be assumed that there is a huge burden borne by labor force for a long time.

Table II-112 Population Structure by Age in Tomu District in 2011

| No. | Village | Age Group | | | | | | | | Total |
|-----|-----------------|-----------|-------|-------|-------|-------|-------|-------|------|-------|
| | | 0-9 | 10-19 | 20-29 | 30-39 | 40-49 | 50-59 | 60-64 | > 65 | |
| 1 | Ekam | 92 | 78 | 45 | 29 | 26 | 7 | 2 | 2 | 281 |
| 2 | Totitra | 48 | 47 | 34 | 22 | 16 | 3 | 1 | 3 | 174 |
| 3 | Tomu | 198 | 143 | 102 | 58 | 48 | 24 | 4 | 6 | 583 |
| 4 | Adur | 3 | 4 | 3 | 2 | 2 | 0 | 0 | 1 | 15 |
| 5 | Taroy | 138 | 96 | 83 | 44 | 38 | 18 | 6 | 2 | 425 |
| 6 | Tambanewa | 32 | 20 | 22 | 7 | 7 | 1 | 1 | 1 | 91 |
| 7 | Sorondauni | 6 | 5 | 1 | 3 | 3 | 1 | 0 | 0 | 19 |
| 8 | Perapera | 35 | 30 | 18 | 11 | 10 | 4 | 0 | 2 | 110 |
| 9 | Sebyar Rejosari | 188 | 180 | 120 | 97 | 73 | 23 | 6 | 5 | 692 |
| 10 | Wanagir | 101 | 101 | 71 | 61 | 37 | 26 | 4 | 3 | 404 |

Source : Survey and Census by UGM, 2011

b. Religion

Islam is majority religion embraced by local residents. In addition to Islam, the religion that is subsequently adopted by many residents is Christian, especially in Sebyar Rejosari.

Table II-113 Population Structure by Religion in Tomu District in 2011

| No. | Village | Religion | | | | | Total |
|-----|-----------------|----------|----------|-----------|-------|--------|-------|
| | | Islam | Catholic | Christian | Hindu | Buddha | |
| 1 | Ekam | 260 | 0 | 0 | 0 | 0 | 260 |
| 2 | Totitra | 174 | 0 | 0 | 0 | 0 | 174 |
| 3 | Tomu | 534 | 4 | 0 | 0 | 0 | 538 |
| 4 | Adur | 15 | 0 | 0 | 0 | 0 | 15 |
| 5 | Taroy | 382 | 0 | 32 | 0 | 0 | 414 |
| 6 | Tambanewa | 91 | 0 | 0 | 0 | 0 | 91 |
| 7 | Sorondauni | 7 | 7 | 5 | 0 | 0 | 19 |
| 8 | Perapera | 100 | 0 | 2 | 0 | 0 | 102 |
| 9 | Sebyar Rejosari | 359 | 20 | 249 | 0 | 0 | 628 |
| 10 | Wanagir | 298 | 26 | 59 | 2 | 0 | 385 |

Source : Survey and Census by UGM, 2011

Tomu District has the highest number of villages among other districts in social boundaries of the AMDAL studies. Tomu District has ten villages that were previously only consisted of four main villages. The number of division villages

implies that a lot of people coming from outside district to this district. Coupled with the presence of transmigrant village increase the number of people coming to the district.

Table II-114 Total Population in Tomu District in 2002, 2009, 2011

| No. | Village | Total Population (Inhabitant) | | |
|-----|-----------------|-------------------------------|-------------------|-------------------|
| | | 2002 ¹ | 2009 ² | 2011 ³ |
| 1 | Tomu | 876 | 528 | 598 |
| 2 | Ekam | | 417 | 455 |
| 3 | Sebyar Rejosari | 815 | 1,254 | 1,096 |
| 4 | Taroy | 253 | 528 | 645 |

Source : 1 AMDAL Tangguh LNG 2002; 2 Social Economic Survey in DAVs by UGM 2009; 3 Census and Survey by PSKK UGM in 2011

- **Pattern of Livelihood and Income Level**

Workforce and Livelihood

It was almost no open unemployment found in Tomu District. All local people classified into labor force have jobs, particularly on local livelihood such as subsistence fishing, sago palms pounding or hunting in the forest. The following table explains workforce and livelihood in Tomu District.

Table II-115 Workforce and Livelihood of Community in Tomu District

| No. | Livelihood | Village | | | | | Total | Total |
|--------------|--|---------|---------|------|------|-------|-------|-------|
| | | Ekam | Totitra | Tomu | Adur | Taroy | | |
| 1 | Fishery | 26 | 14 | 48 | 4 | 52 | 144 | 34% |
| 2 | Gatherer | 11 | 7 | 37 | 1 | 34 | 90 | 21% |
| 3 | Trading and UKM (small-medium scales business) | 5 | 0 | 9 | 0 | 14 | 28 | 7% |
| 4 | Tangguh LNG employee | 9 | 10 | 29 | 0 | 24 | 72 | 17% |
| 5 | PNS (<i>Civil Servant</i>), Teacher, TNI (military), Polri (Police), Village Officials | 17 | 13 | 20 | 0 | 20 | 70 | 16% |
| 6 | Labor/Service | 5 | 6 | 11 | 0 | 3 | 25 | 6% |
| Total | | 73 | 50 | 154 | 5 | 147 | 429 | 100% |

Source : Survey and Census by UGM, 2011

The table above shows that fifty five percent of community in Tomu District engage in traditional sectors, namely fisheries by 34% and gatherers (collecting forest products) by 21 percent. The large number of gatherers in the village is caused by the geographical condition of Tomu District that is closely to the river estuary and in the middle of sago forest. There are 34% of community members who work as fishermen with fishing grounds along the Aranday river estuary and Magarina waters. There are also local people working as employees, mainly working in Tangguh LNG or government officials, teachers, military, and police.



Figure II-195 Mothers are processing sago in Tomu District

Survey and Census in 2011 conducted by PSKK-UGM also showed that most residents have side jobs apart from their main jobs. Thus, side jobs have earned additional or alternative income for community in Tomu. The common side job engaged by women is cultivating sago palms for commercial product as flat sago palms or *tumang*. While men work as employee or government officials for their main job, or catching fish and shrimp carpentry for their side jobs.

Economic Activities

Tomu District can be reached by waterway because it is located along Aranday River. Economic activities are less developing in the district due to the absence of economic path in this area. Kiosks, stalls and shops were not found. The business is generally owned by migrants, and yet there are some stalls owned and managed by Indigenous People*. In this district was also found construction contractor owned and managed by Indigenous People*.

Upon the approval of AMDAL Integrated Activity in 2002, Tangguh LNG has undertaken several economic programs in this district. Provision of 158 units of ketinting has been supplied by Tangguh LNG in 2005 to help fishermen having better fishing. Tangguh LNG also helps the sago palms products to be marketed from Tomu District to Bintuni Township. A number of wood cutting equipments (chainsaw) and sago palms processing equipments has also been provided to community.

In the field of economic development capacity, Tangguh LNG has also conducted several training sessions through Household Economics (PERT) for local people in Tomu District. It has also held technical skills training sago palms processing followed by most of mothers in the district. Tangguh LNG also supports the establishment of UBSP (Saving Loan Joint Units) of Moamae Injigo Raetama Onate (Miro) engaged in savings and loan. The presence of these cooperatives strengthens access to capital for community.

Tomu District also becomes a stocking point for shrimp supplied to catering contractor of Tangguh LNG in order to meet the food supplies for its workforce. To date, a total of 22.41 tons of shrimp were supplied, and 8.77 tons of them were shipping in 2012.

Survey and Census Data of PSKK-UGM indicate the average level of household's income in Tomu District seen on **Table II-121**.

Table II-116 Income per Capita of Tomu District in 2011

| Tomu District | Income per Capita /month (Rp) | Household Income /month (Rp) |
|--------------------------------|-------------------------------|------------------------------|
| Ekam (main village) | 1,968,655 | 574,129 |
| Totira | 1,393,429 | 901,298 |
| Tomu (main village) | 2,216,933 | 746,010 |
| Adur | 1,308,000 | 908,000 |
| Taroy (main village) | 1,424,933 | 1,084,947 |
| Tambanewa | 1,475,000 | 1,029,583 |
| Sorondauni | 1,144,000 | 1,122,500 |
| Perapera | 1,464,000 | 892,150 |
| Sebyar Rejosari (main village) | 1,969,707 | 1,468,831 |
| Wanagir | 1,527,273 | 947,727 |

Source : Survey and Census by UGM, 2011

Community Development

Since 2002, Tangguh LNG runs COMDEV program in Taroy Village, and also in Tomu and Ekam Villages implemented in 2004. Then in 2005, COMDEV program was also implemented in Sebyar Rejosari Village. Following the division of villages and districts, some of the COMDEV fund also allocated throughout each division village besides Taroy, Tomu, Ekam, and Sebyar Rejosari Villages. It is done by the agreement of community, COMDEV committee, and local village government committee.



Figure II-196 Sewing Training in Ekam Village, Tomu District

Through Participatory Planning (PBM), community development committee and community members put a development program for village together, according to needs and priorities. The program emphasizes on: 1) Infrastructure Development Program; 2) Educational Aid; 3) Health; 4) Women Empowerment; 5) Youth Program; 6) Economic Empowerment Program; 7) Religious and; 8) ATK and incentive organizers.

Through COMDEV activities, community is able to participate on development planning in accordance with the needs and priorities existed in the village. Furthermore, community is also able to implement and evaluate each of COMDEV program conducted in the village independently.

- **Local Business Growth**

Economic facilities provided in Tomu District in 2010, namely six stalls in Tomu Village and five stalls in Ekam Village (IPB, 2010). Business types managed by local people consist of farming cultivation, fishing gears, fishery and agricultural products. However, local business growth is dominantly driven by migrants, who formerly worked at sago palms processing company that is now closed, particularly in Sebyar Rejosari Village.

Data related to local growth businesses is incomplete; however, some of available data, for example, Ekam Village data that describes different types of households micro businesses owned by the population, yet, have not been developed further.

- **Natural Resources Utilization**

Fishing activity is carried out by most of Teluk Bintuni Regency population who lives in coastal areas. Although most of local people engage to fishing activities, the view of villages in Bintuni Bay region unlikely seems as fishing villages. Only a few boats anchored on the sea shore as well as fishing activities (catching fish and shrimp) are rarely seen. Local fishermen generally catch prawns, fish, crabs and lobsters.

- **Infrastructure and Transportation Facilities**

- a. *Ekam*

To support daily activities of local people, there are 12 longboats, 86 *ketintings*, and five motorbikse used as public transportation in this village. Infrastructure and public facilities are still limited. There are two village infrastructures which are two village halls available for community and village officials to conduct meetings or other events.

For land transportation, local people commonly use dirt road as transportation access throughout village. In addition, the dirt road also connect between villages. Geographical structure of villages is a swampy area, thus, the dirt road are often having waterlogged. There is also a bridge stretched from the Tomu River conecting Ekam Village with Tomu Village.

- b. *Totira*

Public facilities in Totira, such as education, health, religious, port / jetty, and transportation facilities are available with limited number and poor conditions. The available facilities to support community activities are housing, transportation, and village infrastructure such as Village Hall.

Means of transportation used by local people to go around villages and to other districts are 68 *ketinting*, five longboats, and two motorbikes. Most of the means of transportation is privately owned by the residents.

The majority of residents in this village embraces Islam. However, a mosque has not yet available in this village so that people do their religious activities in their homes.

- c. *Tomu*

Journey to Tomu Village can be reached through two routes, namely through the river by longboat for 15 minutes or by 35 minutes walking from Aranday Village. Heading to local people housing can use motorbike or walking because the distance is not too far away from the village jetty.

There is a village office where the head of village and village officials work. Meeting and other activities are often held by village residents in order to

discuss any agenda or other issues. Village administration is also operated in every working hours.

Other main facilities and infrastructure are provided in this village is transportation infrastructure (such as village roads, sea and river transport infrastructure), as well as means of transportation (such as motorbike, longboat, and *ketinting*/long-tail boat) which has opened the access between this isolated village to other areas. Type of village roads consists of dirt road with inadequate condition due to clay structure. When it rains, the road will be muddy and possibly endanger bikers who passing through it. The primary means of transportation is *ketinting* (long-tail boat) which easily found in each villages. Most of the head of household has *ketinting* rather than loangboat or wooden boat. In addition to carry passengers, such *ketinting*, longboat, and wooden boat also function as a transportation means to fishing activities.

To support the economic activities of the resident, three kiosks / stalls sell groceries and vegetables from local agricultural products. In addition to the stalls, there are also three sellers of betel nut which its fruit and leaves are commonly chewed by Papuan and Tomu District (main village) in particular.

d. *Adur*

Existing facilities in Adur Village are only a transit jetty for paddle boat / sail boat, and longboat, as well as a bridge connecting between villages. The village road is still on a land structure. For means of transportation, *ketinting*, two units of wooden boat, and 15 units of longboat are provided in this village. Other facilities, such as health facilities (Puskesmas) and education facilities have not yet available in this village. Also local children should go to another village or district to attend elementary school due the unavailability of school building.

e. *Taroy*

This village can only be accessed by sea transport since it is located at the sea tides. Meanwhile, the center of Tomu District can only be reached approximately three hours-traveling by longboat. Due to the tidal area, housing and other facilities in this village are built on stilt. Village road is called as walkway that is made of wooden planks and has improved for several times.

There is a village office to support on population administrative service. The construction of the village office is made of good quality of wood and still in very good exterior. Administrative system has been running, such as population data collection and distribution of various programs to the residents.

Economic activities are driven by the presence of kiosk / stall that consist of at least six stalls / kiosks in the village. In addition, there are six people who sell

betel nut. There is no market in the village, therefore, for the activities of buying household needs and goods for kiosk / store, or sell the catch, locals have to go to Sebyar Rejosari Village as a well-known of economic center in the north of Bintuni Bay region.

f. Tambanewa

This village can be accessed through Taroy (main village) or Perapera villages, and then proceed by walk because there is no jetty that can directly access to the village. This village has a road made of wooden plank and also stilt houses built on a swamp. As a means of transportation, there are 11 units of longboats in Tambanewa Village.

As a new village, population administration services have not been going well, as well as an orderly administration. In addition to human resource constraints, local government does not give support and mentoring on how to manage a good settlement. For a while, village head's house is occupied for village office. The entire residents are Islam though none of mosque is built unless go to Taroy Village for praying.

The economic has not yet developed because of the unavailability of support facilities in this village. All economic activity carried out in the nearest village including buying and selling activities by KUD (Village Cooperative) or stall in Taroy.

g. Sorondauni

Transportation access to the village is still quite difficult which finally cause remoteness and rare visits by migrants and government officials. Passing through the sea route, then proceed by the river using a long-tail boat for 2.5 hours from Perapera Village to this village. There has been a small jetty that is an entrance and exit of village. Villagers are quite open to the migrants. The road condition is composed of two types; the first is formed of boards or bamboo road from jetty to the village. The second is dirt road in the village.

As a new village, the village administration system in Sorondauni is not yet well adjusted. A village hall is available to support the implementation of village government activities and meeting for its residents. The role of village officials on mentoring and communication has been going pretty well due to small number of residents in the village. Thus, it is easier to deliver the information to all residents.

Places of worship, such as mosques and churches, are not available in this village so residents have to go to another village such as Taroy Village.

h. Perapera

Perapera has a jetty functioned as an entrance and exit of this village. Road facilities such as walkway made from wooden planks connecting the jetty to village. The road condition is just recently constructed and still in good condition. Village street and houses were made of boards in order to avoid the tide.

As a new village, public facilities are still very limited. There is no village government office building. Village head and village officials conducting administrative services in homes. Existing facilities are sports fields, namely volleyball court and soccer field to support residents to exercise.

i. Sebyar Rejosari

This village is located in the intertidal zone of Sebyar river made it impossible to build a house and various other infrastructures on the ground in the village. Generally, stilt house, as well as a road used for various purposes made of boards called as walkway. Another existing facility of road is a connecting road to another village that has been paved with cement. The road is a main road and connecting road between Tomu and Ekam villages.

Facilities currently built are 27 official houses for elementary school and high school teachers, mosques, Christian church, and the Catholic church. Transport equipment consisted of 20 *ketinting* (long-tail boat), nine longboats, and four timber vessels. To support economy sector, a market, cooperatives and three prawn crackers businesses are developed in Sebyar Rejosari. In addition, there is also a jetty in this small village.

Economic activities are driven by a kiosk / shop provide a various kind of daily needs. Goods are available in stalls / kiosks such as rice, sugar, tea, coffee, cooking oil, kerosene, instant noodles, cigarettes, and others. Currently, there are 43 kiosks / stalls which are generally owned by migrants.

j. Wanagir

The village is relatively completed with physical infrastructure. Those facilities include village hall and village office, police station, official residence of doctors, six official houses for nurses, dormitory, Catholic church, a volleyball court, health center, six *ketinting* (long-tail boat), three longboats, and timber vessel.

This village is located in the intertidal zone of Sebyar River, so that housing is generally on stilt shape. Road of this village consists two types; firstly, made of

wooden planks / walkway, and the other has been paved with cement. The cement road used to be the only connecting road from Sebyar Rejosari to Tomu and Ekam villages.

Economy wheels driven by a kiosk / shop provide a various kind of daily needs. Goods are available in stalls / kiosks such as rice, sugar, tea, coffee, cooking oil, kerosene, instant noodles, cigarettes, and others. Currently, there are 43 kiosks / stalls which are generally owned by migrants. In addition to kiosks / stalls, there are also eight betel nut sellers that support the habit of local people in chewing betel nut.

- **Education**

PSKK-UGM Studies in 2011 showed that there were five schools in Tomu District, with a composition of three elementary schools (SD), i.e. SD H.T.I Aranday Inpres, SD Tomu Inpres, and SDN Taroy; One junior high school (SMP), i.e. SMP Aranday; and one high school (SMA) i.e. SMA Swadaya Aranday.

SD H.T.I Aranday Inpres only has six classrooms, with the total number of students as many as 189 students in 2011. Thus, it is assumed each class accommodates approximately 32 students. Educational implementation in SD H.T.I Aranday Inpres supported by ten teachers available, thus, it is assumed that every single teacher has to teach approximately 19 students.

SD Tomu Inpres also has six classrooms, with the total number of students as many as 261 students in 2011. It indicates that every classroom should accommodate 37 students. There are only seven teachers available to teach in this school. Consequently, if compared to the total number of students, the teachers are responsible to teach approximately 44 students in a classroom.

In 2011, SDN Taroy has 145 students with five classrooms available. Compared to number of classroom, there should be 24 students attending each class. This school provides nine teachers who are responsible as many as 16 students for each class.

SMP Aranday has 142 students with only six classes available. Each class accommodates 24 students. Of nine teachers available in the school, 16 students are assumed to be ideally accommodated by every single teacher.

By 2011, SMA Swadaya Aranday is still in the process of development. Although there have been 136 students enrolled and accommodated by six contract teachers. Each teacher ideally teaches 23 students. However, there are only three classrooms, plus a library that frequently functioned as additional classrooms. In fact, each classroom can accommodate approximately 45 students.



Figure II-197 SD Negeri Taroy (Taroy Elementary School)

Table II-117 Total of Schools in Tomu District in 2011

| No. | School | Total of Student | Classroom | Class-Student Ratio | Total of Teacher | Teacher-Student Ratio |
|-----|-------------------------|------------------|-----------|---------------------|------------------|-----------------------|
| 1 | SD Inpres H.T.I Aranday | 189 | 6 | 31.5 | 10 | 18,9 |
| 2 | SD Inpres Tomu | 261 | 6 | 43.5 | 7 | 37.3 |
| 3 | SD Negeri Taroy | 145 | 5 | 24.2 | 9 | 16.1 |
| 4 | SMP Negeri Aranday | 142 | 6 | 23.7 | 9 | 15.8 |
| 5 | SMA Swadaya Aranday | 136 | 3 | 45.3 | | |

Source : Survey and Census by UGM, 2011

c. Babo District

- **Description and General Overview**

After the regional division, Babo District consists of five villages, namely Irarutu III, Kanaisi, Nusei, Kasira and Modan. Irarutu III Village (old village) is the main village and also the capital of district. The UGM Census in 2011 recorded that the division process is not yet complete, so village boundaries are administratively indistinctive. These symptoms complicate the implementation and distribution of partnership program with the district.

Irarutu tribe resides in this village as well as become the owner of customary rights, which include in Babo Petuanan. Irarutu III Village has become a major destination due to accessible airport and port facilities. This village is also the economic central in the coastal of Bintuni Bay. Stores, stalls and trading activity

can be found in the center of the city. Tangguh LNG facility also put Tangguh LNG operations support in Irarutu III.

Similar to other districts which received support of governance strengthening, Tangguh LNG also provides Civil Administration Information System (SIAK), civil registration, strategic planning, governance administration, budget planning districts / villages and *tupoksi* (function and its responsibilities) of village and district officials and *Baperkam* (Village Representative Institutions) member in Babo District.



Figure II-198 A Village in Babo District

Total of Population

Total of population in Babo District reached up to 2,783 inhabitants. Old Irarutu Village initially existed as the first village prior to village division divided into five villages, namely Irarutu III, Nusei, Kanaisi, Kasira, and Modan villages.

Of the five existing villages, three villages consist of Nusei, Irarutu III and Modan villages, have the largest population. Irarutu III is a migrant destination that also serves as a transit village.

Table II-118 Total Population in Babo District in 2011

| No. | Village | Population (Inhabitant) | | | Sex Ratio |
|-----|-------------|-------------------------|-------|-------|-----------|
| | | Males | Males | Males | |
| 1 | Irarutu III | 432 | 419 | 851 | 103.1 |
| 2 | Nusei | 465 | 406 | 871 | 114.5 |
| 3 | Kanaisi | 66 | 75 | 141 | 88 |

| No. | Village | Population (Inhabitant) | | | Sex Ratio |
|-----|---------|-------------------------|-------|-------|-----------|
| | | Males | Males | Males | |
| 4 | Kasira | 55 | 56 | 111 | 98.2 |
| 5 | Modan | 421 | 388 | 809 | 108.5 |

Source : Survey and Census by UGM, 2011

Table II-119 Total Population in Babo District in 2002, 2009, 2011

| No. | Village | Population (Inhabitant) | | |
|-----|-------------|-------------------------|-------------------|-------------------|
| | | 2002 ¹ | 2009 ² | 2011 ³ |
| 1 | Irarutu III | 546 | 2,448 | 1,818 |

Source : 1 AMDAL Tangguh LNG 2002; 2 Social Economic Survey in DAVs by UGM 2009; 3 Census and Survey by PSKK UGM in 2011

Population Structure

a. Age

Age group in this district have the same characteristics in other villages of district that are mostly dominated by young age groups between ages 0 - 29 years. High number of young population make burden for labor force which is unlikely shrinking in a proximate period.

Table II-120 Population Structure by Age in Babo District in 2011

| No. | Village | Age Group | | | | | | | | Total |
|-----|-------------|-----------|-------|-------|-------|-------|-------|-------|------|-------|
| | | 0-9 | 10-19 | 20-29 | 30-39 | 40-49 | 50-59 | 60-64 | > 65 | |
| 1 | Irarutu III | 231 | 167 | 164 | 132 | 81 | 52 | 11 | 13 | 851 |
| 2 | Nusei | 242 | 209 | 145 | 113 | 77 | 56 | 14 | 15 | 871 |
| 3 | Kanaisi | 44 | 35 | 15 | 30 | 14 | 3 | 0 | 0 | 141 |
| 4 | Kasira | 43 | 18 | 20 | 12 | 6 | 7 | 3 | 2 | 111 |
| 5 | Modan | 316 | 145 | 173 | 126 | 91 | 44 | 6 | 8 | 809 |

Source : Survey and Census by UGM, 2011

b. Religion

The village residents in the Babo District are Islam in majority. Besides Islam, community embraces to Catholic, Christian, Hindu and Budha. This heterogeneity is indicated by the number of in-migration, both from Papua or outside Papua. The total of Christian population is similar to Hinduism which is majorly embraced by Kanaisi Village. In brief, third largest religious group (Islam, Christian and Hindu) is slightly different in number, consecutively.

Table II-121 Population Structure by Religion in Babo District in 2011

| No. | Village | Religion | | | | | Total |
|-----|-------------|----------|----------|-----------|-------|------------|-------|
| | | Islam | Catholic | Christian | Hindu | Buddh a | |
| 1 | Irarutu III | 511 | 103 | 197 | 1 | 1 | 813 |
| 2 | Nusei | 523 | 125 | 207 | 0 | 0 | 855 |

| No. | Village | Religion | | | | | Total |
|-----|---------|----------|----------|-----------|-------|--------|-------|
| | | Islam | Catholic | Christian | Hindu | Buddha | |
| 3 | Kanaisi | 65 | 16 | 47 | 47 | 0 | 128 |
| 4 | Kasira | 101 | 0 | 4 | 0 | 0 | 105 |
| 5 | Modan | 597 | 50 | 127 | 0 | 0 | 774 |

Source : Survey and Census by UGM, 2011

- **Pattern of Livelihood and Income Level**

Workforce and Livelihood

Most people in Babo commonly work in trading sector, office employees, and government officials. Only 21% are working in the fisheries and agriculture sectors. Babo is an relatively open access to commercial ships that carry passengers from other regions. An airport is also available and commonly used to support oil companies operating in Bintuni Bay region.

It has recorded that 8% of labor force is unemployed. However, these figures are open unemployment; disguised unemployment is perceived to be higher than that. As dependency ratio reaches 69 means that every 100 people in the productive age bears 69 unproductive people (babies, elderly, etc.) in Babo. In general, all community members have jobs, even if it is only done subsistence activities. The following table explains employment and livelihoods in Babo District.

Table II-122 Workforce and Livelihood of Community in Tomu District

| Livelihood | Modan | Irarutu III | Nusei | Kanaisi | Kasira | Total | % |
|---|------------|-------------|------------|------------|------------|--------------|-------------|
| Fishery | 90 | 28 | 62 | 3 | 8 | 191 | 17% |
| Agriculture | 9 | 6 | 20 | 4 | 1 | 40 | 4% |
| Trading and UKM | 83 | 84 | 40 | 3 | 11 | 221 | 19% |
| Employees | 98 | 64 | 54 | 1 | 2 | 219 | 19% |
| Teacher/PNS (civil servant)/TNI (military)/Polri (police)/Village Officials | 68 | 92 | 44 | 2 | 2 | 208 | 18% |
| Labor/ Service | 51 | 47 | 59 | 4 | 9 | 170 | 15% |
| Workforce | 399 | 321 | 279 | 17 | 33 | 1,049 | 92% |
| Unemployment | 24 | 23 | 39 | 0 | 1 | 87 | 8% |
| Labor Force | 423 | 344 | 318 | 17 | 34 | 1,136 | 42% |
| Non-Labor Force: Housewife, Student, Infant & Elderly | 351 | 469 | 537 | 111 | 71 | 1,539 | 58% |
| Total Population | 774 | 813 | 855 | 128 | 105 | 2,675 | 100% |

Source : Survey and Census by UGM, 2011

Some residents in Babo have a side job mainly on catching fish or crabs, selling daily needs in kiosk or service such as motorcycle and TKBM (dockworker). Thus, side job has become an additional or alternative income for community.

Economic Activities

Babo District is more accessible compared to other areas in the Bay, therefore, Babo become a major destination village for migrants to settle down, or transit village before moving to the other village.

Economic growth in Babo is dominated by migrants. In this town, daily necessities and foods are provided in stores, small restaurants and food stalls. Also shops sell clothes and school supplies. Shops and stalls as well as *ojek* (motorcycles that take pillion of passenger) are generally managed by migrants and partially Indigenous People¹ who commonly prefer to work as TKBM (dockworker). Some local contractors also engage to housing construction. To provide capital and financial services, BRI and Papua Bank equipped with ATM machines are available in Babo.

Although Babo does not specified as Directly-Affected Villages (DAVs) on AMDAL Integrated Activity 2002, its location adjacent to in part of Tangguh LNG facility. Therefore, in new AMDAL document, Babo is considered to obtain social programs as well as other DAVs. Since 2003 to date, several economic programs have been running in Babo such as Multipurpose Business Cooperative in Tambaysiri and Rajaberefal, fishery products outlets and vegetable farming, crab fattening and bicycle workshop.

As in Weriagar and Taroy, Babo also become stocking point for vegetable, fruit and crabs to supply labor's food needs of Tangguh LNG. At this time, a total of 80.64 tons of vegetables and crabs have been sent to catering contractor, of which 23.64 tones are part of supplies during 2012.

The following training and mentoring have been also done to support community capacity building in Babo are Household Economy Training (PERT), training and mentoring for agricultural crops of vegetables and fruits, cooperative management and crab fattening.

The average household income in Babo District earned by community can be seen on **Table II-128**.

Table II-123 Income per Capita in Babo District in 2011

| Babo District | Income Per Capita/ month (Rp) | Household Income/month (Rp) |
|---------------------|-------------------------------|-----------------------------|
| Irarutu III (Induk) | 928,187 | 3,417,520 |
| Nusei | 938,156 | 3,824,524 |

¹ See the terminology on Tangguh Social Management document

| | | |
|---------|-----------|-----------|
| Kanaisi | 916,667 | 5,500,000 |
| Kasira | 1,343,333 | 6,716,667 |
| Modan | 1,414,111 | 5,403,833 |

Source : Survey and Census by UGM, 2011

Community Development

Since 2005, Tangguh LNG has implemented COMDEV program in Irarutu III Village. Along with the division of villages and districts, funds originally allocated to the COMDEV in Irarutu III, some of the funding was developed to COMDEV throughout each village division. This is done with the agreement of community, COMDEV committee, and local village government committee.

Through Participatory Planning (PBM), community development committee and community members put a development program for village together, according to needs and priorities. The program emphasizes on: 1) Infrastructure Development Program; 2) Educational Aid; 3) Health; 4) Women Empowerment; 5) Youth Program; 6) Economic Empowerment Program; 7) Religious and; 8) ATK and incentive organizers.

Through COMDEV activities, community is able to participate on development planning in accordance with the needs and priorities existed in the village. Furthermore, community is also able to implement and evaluate each of COMDEV program conducted in the village independently.

- **Local Business Growth**

Based on Food Security Survey data by IPB in 2010, Babo District especially Irarutu III has the largest economy facilities of all surveyed location. Irarutu III has 132 kiosks / stalls and six markets among any districts in Teluk Bintuni Regency.



Figure II-199 Store in Babo District

Types of businesses owned by residents cover crops, fishery and agricultural products. In addition, there is also a betel nut seller as betel nut chewing becomes habit of local people. Based on the above data, the orientation of economic activity almost focuses on commercial business. In fact, the presence of stalls and market seems to be very important in the growth of local businesses.

Table II-124 Type of Local Business in Babo District in 2011

| Type of Business | Irarutu III | |
|------------------|-----------------------|-------------------------|
| | Commodity Product (%) | Consumption Product (%) |
| Farming | 100 | 0 |
| Fishermen | 96.4 | 3.6 |
| Fishery | 97 | 3 |
| Agriculture | 100 | 0 |

Source : Food Security Survey by IPB, 2010

- **Natural Resources Utilization**

Located on the coastal area, fishing activity is a common livelihood of local people mostly carried out by men. Fishing activities is running individually or in groups, either day or night. Although this livelihood is classified as male activity, some women have also done it particularly during the day and at night when the full moon occurred. Types of fishing targets in Babo District are shrimp and crab (UNIPA, 2006).

The results of fishery study in 2013 by IPB, mentioned the type of fish species in Babo District like snapper, mullet, *sembilang* fish, sharks, *bandeng* fish, shrimp and crab. Fishing gears used by local people are fishing line, nets and traps. The

fishery products are marketed in Bintuni, while for shrimp and crab is marketed in Jakarta.

- **Infrastructure and Transportation Facilities**

Modan

The condition of village road is quite good because most have a asphalt road though not so flat and hollow. Only main village road has been paved. Village road is extremely muddy in rainy season, and when the dry season comes, the streets will be awfully dusty. Vehicles such as cars or motorcycles can pass through the village road. In addition to longboat, some people have motorcycles and car as a means of land transportation to facilitate their journey. Also *ketinting* and longboat which are usually stop at jetty, and a lot of TKBM (dockworker) who serves to carry passengers stuff.

Irarutu III

Type of transportation used towards this village is through air and seawater. There is a big port functioned as a dock for large ships coming from other districts and also a relatively small jetty as dock for small boats from other villages. In addition, there are airports that only functioned for company facilities.

As the capital district of Babo, this village has adequate infrastructure and facilities to accommodate the needs of all its resident. Public facilities, such as roads, bridges, drainage, and jetty, are in fairly good condition although there is some repairs need for wooden walkway which connects between houses in this village. Other public facilities, such as health facilities, education, religion, economy, government offices, as well as economic facilities are adequately complete.

There is also a traditional market as a place for community runs economic activity in Babo District. Commodity products such as fruits and vegetables are sold in the market. Fish and other fishing catches are sold at a small jetty and some are sold in the surroundings. There are also vegetables and fruit stalls at several houses of local people. In this village also stands a large market that provides clothing and household necessities, such as stove and bucket. The mini market is also brisk the economic activity of the population.

The villagers have a variety choice of transportation means, but mostly have their own means of water transportation.

Nusei

Regular transportation means that is used to enter this village is airplane, boats, and speedboat. By using a longboat, people can travel to the village about 45 minutes. Meanwhile, transportation means commonly found throughout the village is *ojek* (motorcycles that take pillion of passenger).

The infrastructures and public facilities in the village are not yet complete since it is an division village. Nevertheless, an elementary school in Nusei Village has existed and equipped with a soccer field.

Kanaisi

Similar to the condition of Nusei Village, the provision of infrastructure and public facilities in Kanaisi are still incomplete due to the division village. However, a junior high school has already built in this village. Next to the airport and jetty, this village provides a boarding house as the effort of local business development.

Kasira

This village can be only reached by long-tail boat or *ketinting* and longboat and cannot be accessed by land transportation. However, the villagers can use land or water transportations for only a close visit to health facility or village office located in the village area.

Village conditions are currently in the process of development of both infrastructure and public facilities, including housing. New public facilities in this village is a village hall that functioned as a place for community meeting or other events. However, other public facilities such as place of worship (mosques and churches) are not yet available.

- **Education**

Education facilities such as schools are sufficiently provided particularly for elementary school. A study conducted by PSKK-UGM in 2011 identified the existence of three elementary schools which are SD Inpres Babo, SD Nurul Falaq Asmanu and SD YPPK Babo. Meanwhile, only one junior high school is built on the district i.e. SMP Negeri Babo; and one high school i.e. SMA Persiapan Babo.

SD Inpres Babo has 284 students which are accommodated by eight classrooms. According to student-classroom ratio, every single class is ideally accommodated 36 students. There are also 12 teachers worked in SD Inpres Babo. By looking at the total number of students, it can be considered that each teachers ideally have 24 students.

SD Nurul Falah Asmanu has smallest number of students which is 79 people. It is assumed that each classroom has approximately 19 students. Only four teachers teach in SD Nurul Falah Asmanu. Considering the total number of students (79 people), each teachers in this school has only as many as 20 students.

There are 163 students in SD YPPK Babo. The teaching-learning activities is running in the seven existing classrooms. Thus, it is assumed that every classroom can accomodate approximately 23 students. There are only seven teachers in this school and responsible to teach 23 students.

SMP Negeri Babo has a total number of 247 students studying in eight available classrooms. Consequently, every class can be attended by approximately 31 students. There are 17 teachers that should ideally teach about 15 students.

d. Aroba District

- **Demographic and General Overview**

Aroba District stretches along 859 km² in the southern part of Bintuni Bay. This district is established as the division of Babo District. Total of population in Aroba District based on Population Census in 2010 is 2,601 inhabitants with sex ratio distribution consist of 1,635 males and 966 females.

Aroba District consists of five villages, namely Wimbro, Aroba, Yaru, Sidomakmur, and Saengguar. Of the five villages are only two villages were included on the AMDAL study, namely Wimbro and Sidomakmur. At this time, mentoring and governance strengthening program by Tangguh LNG in cooperation with PSKK-UGM have not yet covered Aroba Districts and its villages.



Figure II-200 Wimbro Village in Aroba District

Total of Population

Since Wimbro Village is the only village in Aroba District that is estimated to get direct impact from the Tangguh LNG Expansion Project activities, this village is considered as part of AMDAL study. The total population demonstrates 121 people living in this district which is divided into 30 households (KK). This population consists of Indigenous People* derived from Irarutu tribe, and migrants from other tribes in Papua and outside Papua.

Table II-125 Total Population in Aroba District in 2011

| No. | Village | Population (Inhabitant) | | | Sex Ratio |
|-----|---------|-------------------------|--------|-------|-----------|
| | | Male | Female | Total | |
| 1 | Wimbro | 66 | 55 | 121 | 1,2 |

Source : Survey and Census by UGM, 2011

Table II-126 Total Population in Aroba District in 2002, 2009, 2011

| No. | Village | Population (Inhabitant) | | |
|-----|---------|-------------------------|-------------------|-------------------|
| | | 2002 ¹ | 2009 ² | 2011 ³ |
| 1 | Aroba | 485 | 360 | 121 ^{*)} |

Source : 1 AMDAL Tangguh LNG 2002; 2 Social Economic Survey in DAVs by UGM 2009; 3 Census and Survey by PSKK UGM*) total population of Wimbro Village

Aroba District has currently encountered regional division for several times. Based on the Socio-Economic Survey report by PSKK-UGM (for Tangguh LNG monitoring) in 2009 stated that Aroba District has experienced village division into three villages such as Sangguar, Air Terjun and Wame villages. Number of villages in the district has also encountered with division. Based on the Spatial Plan of Bintuni (RTRW) in 2011-2030 mention name of villages has existed in

Aroba District namely Aroba, Wimbro, Sidomakmur, Sangguar, and Yaru villages.

Population Structure

a. Age

Similar to other villages, young age group between 0-39 years is dominated the village population. Population aged 0-9 years amounted to 35 people has become the largest age group followed by the productive age between 30-39 years as many as 26 people. Most of labor force mainly work at the shrimp cultivation company.

Table II-127 Population Structure by Age in Aroba District in 2011

| No. | Village | Age Group | | | | | | | | Total |
|-----|---------|-----------|-------|-------|-------|-------|-------|-------|------|-------|
| | | 0-9 | 10-19 | 20-29 | 30-39 | 40-49 | 50-59 | 60-64 | > 65 | |
| 1 | Wimro | 35 | 18 | 16 | 26 | 22 | 4 | 0 | 0 | 121 |

Source : Survey and Census by UGM, 2011

b. Religion

Wimbro community embraces Islam, Catholic and Christian. There are no village residents in Wimbro embrace Hindu or Buddha. A similar number of Islam and Catholic exist in this village.

Table II-128 Population Structure by Religion in Aroba District in 2011

| No. | Village | Religion | | | | | Total |
|-----|---------|----------|----------|-----------|-------|-------|-------|
| | | Islam | Catholic | Christian | Hindu | Budha | |
| 1 | Wimbro | 46 | 46 | 29 | 0 | 0 | 121 |

Source : Survey and Census by UGM, 2011

- **Pattern of Livelihood and Income Level**

Workforce and Livelihood

Survey and Census Data by PSKK-UGM in 2011 reported that 50% of labor force working in the fisheries sector. Another potential livelihood encountered by community such as agriculture, trading, labor and services, employee and government officials. Unemployment is recorded 5% of the total workforce. As dependency ratio reaches 68 means that every 100 people consist of 68 unproductive people (babies, elderly, etc.) that are borne by 32 productive people in Aroba.

Economic Activities

In the past, Wimbro was a fisheries stocking point for community in Bintuni Bay where PT. Bintuni Mina Kingdom was formerly engaged in fishery and part of Jayanti Group of Jakarta. Since the company has no longer operated in Wimbro, the economic activity in the village decreases dramatically.

To date, Wimbro become a gathering place for fishery collectors from Bintuni Bay which later distribute the products to Sorong. Tangguh LNG program has not yet implemented in Aroba District including in Wimbro Village. Average household income of Wimbro community is Rp 2,510,350,- per month, and the average income per capita is Rp 816,394,- per month.

- **Local Business Growth**

Economic facilities in Aroba District, especially in Wimbro Village is not yet completely provided such as daily market facilities. Activity in the market only runs on certain days. Many residents frequently go to shop / kiosk / groceries to buy food, groceries, vegetables, and other daily needs. Local economy is driven by a shrimp processing company.

- **Utilization of Natural Resources**

Fishery resources is managed by various parties such as local people as the owners of customary rights, migrant communities, private companies and large corporations. Although fishing ground is not located at this village, most of residents are working on fisheries. Type of fishing catches is shrimp and fish.

- **Infrastructure and Transportation Facilities**

The village has limited facilities. Roads, bridges and jetty are minimum and in poor condition. Sea transportation mostly used by community such as boats, *ketinting*, longboats and canoes. The road in this village is walkway (made of wooden planks) and dirt road. While surrounding the company, there is a concrete path with minimum length.

Village office and village hall are pretty good condition. The village hall is also functioned as a place for community activities. However, residents are more frequently complete administration services in village secretary's house. Although only small damage occurs to the village office and hall, it does not interrupt the working process of village activities. Village hall is commonly used for many activities on Posyandu or other activities, and sometimes also used as a fish market.

The villagers are mostly migrants with a diversity of social, religion and cultural background. Thus, there are three places of worship in the district such as Mosques, Christian and Catholic churches that portray community diversity.

- **Education**

Based on the study conducted by PSKK-UGM in 2011, there were only four schools in Aroba District, which consists of four elementary schools, namely SD Inpres Wimbro, SD YPPK Aroba, SD YPPK Yaru, and also a junior high school named SMP Satu Atap Wimbro.

In SD Inpres Wimbro, there are 145 students studying in six classrooms. Thus assumed every single class has an ideal capacity of as many as 24 students. Only 6 teachers are available of which every teacher should bear as many as 24 students. Meanwhile, SD YPPK Aroba has 113 students with six classrooms available. It concludes that classroom can accommodate 19 people for each. There are five teachers who teach these students, in other words, every teacher has a teaching capacity for 23 students. On the other hand, SD YPPK Yaru has a total of only 54 students who study in six different classrooms, thus, each class has an ideal capacity of as many as nine students. Three main teachers are available in this school by 18 students of teaching capacity.

As the only junior high school in Aroba District, SMP Satu Atap Wimbro only has 16 students with only one classroom. Despite of having permanent teaching staff, the school teacher is hired temporarily from SD Inpres Wimbro.

Table II-129 Total of Schools in Aroba District in 2011

| No. | School | Total of Student | Classroom | Class-Student Ratio | Total of Teacher | Teacher-Student Ratio |
|-----|------------------|------------------|-----------|---------------------|------------------|-----------------------|
| 1 | SD Inpres Wimbro | 145 | 6 | 24.2 | 6 | 24.2 |
| 2 | SD YPPK Aroba | 113 | 6 | 18.8 | 5 | 22.6 |
| 3 | SD YPPK Yaru | 54 | 6 | 9 | 3 | 18 |
| 4 | SMP Satap Wimbro | 16 | 1 | 16 | N/A | N/A |

Source : Survey and Census by UGM, 2011

e. Sumuri District

- **Demographic and General Overview**

Sumuri District is located at the south shore of Bintuni Bay, and has a long coastline, with a total area reached 1,922 km². This district is a division of Babo District in 2009. Initially, there were seven villages in Sumuri District. Then, of a division into Onar Village, Onar Lama Village and Onar Baru Village, so there are currently nine villages in the district. In addition, this district has two migrant villages, i.e. Materabu Jaya or known as the first housing (SP 1) and Fuerada (SP 2). In terms of geographical, ecological, and demographic and socio-cultural, Sumuri District has a heterogeneous community.

Similar to other districts in DAVs, governance mentoring system is applied through government official strengthening program including Civil Administration Information System (SIAK), civil registration, strategic planning, governance administration, budget planning districts / villages and *tupoksi* (function and its responsibilities) of village and district officials and *Baperkam* (Village Representative Institutions) members in Sumuri District. At the village level, mentoring has implemented in village of Tanah Merah Baru (New Tanah Merah/TMB), Saengga, Onar Lama, Onar Baru and Tofoi.



Figure II-201 Tanah Merah Baru Village in Sumuri District

Total of Population

The population in the district is 4,177 inhabitants. Of eight villages in the district, three villages have the largest population, namely Tofoi, Tanah Merah Baru and Saengga. Tofoi and Saengga are old villages, while the Tanah Merah Baru is a new village relocation of Tanah Merah Lama.

Sumuri District has a variety of residents concerning tribe, homeland, or field of work compared to people living in Weriagar District.

Table II-130 Total of School in Sumuri District in 2011

| No. | Village | Population (Inhabitant) | | | Sex Ratio |
|-----|------------------|-------------------------|--------|-------|-----------|
| | | Male | Female | Total | |
| 1 | Onar Lama | 75 | 76 | 151 | 98,6 |
| 2 | Onar Baru | 143 | 129 | 272 | 110,8 |
| 3 | Tanah Merah Baru | 415 | 378 | 793 | 109,7 |
| 4 | Saengga | 375 | 372 | 747 | 100,8 |
| 5 | Tofoi | 1080 | 870 | 1950 | 124,1 |
| 6 | Padang Agoda | 67 | 57 | 124 | 117,5 |
| 7 | Materabu Jaya | 24 | 32 | 56 | 75 |
| 8 | Furada | 43 | 41 | 84 | 104,8 |

Source : Study by UGM, 2011

Formerly, Sumuri District is a part of Babo District, Manokwari Sub-district. After Bintuni Bay region changes into an independent sub-district, Tanah Merah Baru, Saengga and Tofoi villages incorporated to Sumuri District.

Table II-131 Total of School in Sumuri District in 2002, 2009, 2011

| No. | Village | Population (Inhabitant) | | |
|-----|-------------|-------------------------|-------------------|-------------------|
| | | 2002 ¹ | 2009 ² | 2011 ³ |
| 1 | Tanah Merah | 369 | 732 | 793 |
| 2 | Saengga | 345 | 624 | 747 |
| 3 | Tofoi | 1.511 | 1.430 | 1.950 |

Source : 1 AMDAL Tangguh LNG 2002; 2 Social Economic Survey in DAVs by UGM 2009; 3 Census and Survey by PSKK UGM, 2011

Population Structure

a. Age

Age group of population in Sumuri District is dominated by young age group at the age of 0 – 29 years old. A dynamic population structure in each age group affects a big burden borne by labor force starting from now to future.

Table II-132 Population Structure by Age in Sumuri District in 2011

| No. | Village | Age Group | | | | | | | | Total |
|-----|------------------|-----------|-------|-------|-------|-------|-------|-------|------|-------|
| | | 0-9 | 10-19 | 20-29 | 30-39 | 40-49 | 50-59 | 60-64 | > 65 | |
| 1 | Onar Lama | 49 | 31 | 24 | 19 | 21 | 2 | 3 | 2 | 151 |
| 2 | Onar Baru | 78 | 57 | 46 | 46 | 23 | 19 | 2 | 1 | 272 |
| 3 | Tanah Merah Baru | 223 | 172 | 151 | 119 | 65 | 39 | 7 | 7 | 793 |
| 4 | Saengga | 222 | 165 | 144 | 92 | 70 | 37 | 9 | 8 | 747 |
| 5 | Tofoi | 390 | 335 | 250 | 222 | 158 | 71 | 15 | 17 | 1458 |
| 6 | Padang Agoda | 33 | 25 | 28 | 16 | 14 | 4 | 1 | 3 | 124 |
| 7 | Materabu Jaya | 10 | 10 | 7 | 6 | 13 | 5 | 1 | 4 | 56 |
| 8 | Furada | 21 | 22 | 9 | 9 | 13 | 6 | 2 | 2 | 84 |

Source : Survey and Census by UGM, 2011

b. Religion

Village residents living in the villages of Sumuri District widely embrace Islam, Catholic, and Christian. Hindu and Buddha are also found in this district but only in Tofoi. Population diversity in terms of religion does not determined by the large number of population.

Table II-133 Population Structure by Religion in Sumuri District in 2011

| No. | Village | Religion | | | | | Total |
|-----|------------------|----------|----------|-----------|-------|--------|-------|
| | | Islam | Catholic | Christian | Hindu | Buddha | |
| 1 | Onar Lama | 78 | 52 | 13 | 0 | 0 | 143 |
| 2 | Onar Baru | 109 | 13 | 111 | 0 | 0 | 233 |
| 3 | Tanah Merah Baru | 216 | 128 | 365 | 0 | 0 | 709 |
| 4 | Saengga | 85 | 458 | 69 | 0 | 0 | 612 |
| 5 | Tofoi | 346 | 578 | 461 | 1 | 7 | 1393 |
| 6 | Padang Agoda | 2 | 70 | 80 | 0 | 0 | 100 |

| No. | Village | Religion | | | | | Total |
|-----|---------------|----------|----------|-----------|-------|--------|-------|
| | | Islam | Catholic | Christian | Hindu | Buddha | |
| 7 | Materabu Jaya | 56 | 0 | 0 | 0 | 0 | 56 |
| 8 | Furada | 43 | 18 | 23 | 0 | 0 | 84 |

Source : Survey and Census by UGM, 2011

- **Pattern of Livelihood and Income Level**

Labor and Livelihood

Majority of community in Tofoi works as employees by 31%, then followed by 19% in the agricultural sector and other sectors of fisheries, trading and services. The dominant livelihood as employees and on agricultural sector is influenced by the location of largely villages away from the shore, except Onar and Tanah Merah Villages. In addition, the presence of exclusive zone has restricted access to the fishermen of Tanah Merah and Saengga to catch fish.

On the other hand, many people who come from Tofoi, Agoda, Materabu and Furada working in the wood processing industry or oil palm plantations that exist in their area. Transmigrants of Materabu and Furada generally have agricultural land planted with vegetables. Meanwhile, many people from Tofoi, Tanah Merah and Saengga work in Tangguh LNG.

Unemployment in Sumuri District is recorded by 8% of the total workforce. However, these figures are perceived as open unemployment, while disguised unemployment is predicted to be higher than that.

Table II-134 Type of Livelihood of Community in Sumuri District

| Livelihood | Onar Lama | Onar Baru | Tanah Merah Baru | Saengga | Tofoi | Padang Agoda | Materabu Jaya | Furada | Total | % |
|---|-----------|------------|------------------|------------|------------|--------------|---------------|-----------|-------------|------------|
| Fishery | 29 | 37 | 7 | 53 | 9 | 0 | 0 | 0 | 135 | 11% |
| Agriculture | 4 | 22 | 54 | 39 | 53 | 24 | 24 | 18 | 238 | 19% |
| Trading and UKM | 5 | 7 | 31 | 14 | 124 | 3 | 6 | 7 | 197 | 15% |
| Employee | 6 | 14 | 99 | 58 | 207 | 5 | 3 | 6 | 398 | 31% |
| Teacher/PNS (civil servant)/TNI (military)/Polri (police)/Village Officials | 3 | 9 | 32 | 16 | 71 | 6 | 0 | 1 | 138 | 11% |
| Labor/Service | 0 | 4 | 12 | 4 | 53 | 1 | 1 | 3 | 78 | 6% |
| Workforce | 47 | 93 | 235 | 184 | 517 | 39 | 34 | 35 | 1184 | 92% |
| Unemployment | 1 | 6 | 19 | 32 | 34 | 2 | 0 | 4 | 98 | 8% |
| Labor Force | 48 | 99 | 254 | 216 | 551 | 41 | 34 | 39 | 1282 | 38% |
| Non-Labor Force: housewife, student, infant & elderly | 95 | 134 | 455 | 396 | 842 | 59 | 22 | 45 | 2048 | 62% |

| Livelihood | Onar Lama | Onar Baru | Tanah Merah Baru | Saengga | Tofoi | Padang Agoda | Materabu Jaya | Furada | Total | % |
|-------------------------|------------|------------|------------------|------------|-------------|--------------|---------------|-----------|-------------|-------------|
| Total Population | 143 | 233 | 709 | 612 | 1393 | 100 | 56 | 84 | 3330 | 100% |

Source: Survey and Census by UGM, 2011

Economic Activities

Similar to Babo District, Sumuri also become one destination of migrants due to wood processing companies in Tofoi, palm oil plantations in Materabu and Furada and Tangguh LNG in Tanah Merah. In this area, there is also a transmigrant housing from Java which are largely of the population have agricultural land.

Local market is the central of agricultural products and fisheries sales for Tofoi and surrounding communities. A general commercial marine transportation provides commute route service from Tofoi to Babo. This village also has a post and Bank BRI as well as ATM services to serve financial demand from the community. The average income of Sumuri community shown in the following table:

Table II-135 Average Income of Community in Sumuri District

| Sumuri District | Income per Capita/month (Rp) | Household Income/month (Rp) |
|--------------------------|------------------------------|-----------------------------|
| Onar Lama (Main Village) | 1,218,353 | 3,778,997 |
| Onar Baru | 314,080 | 1,775,598 |
| Tanah Merah Baru | 1,091,123 | 4,781,858 |
| Saengga | 826,784 | 3,784,585 |
| Tofoi | 1,204,705 | 4,722,880 |
| Padang Agoda | 718,639 | 3,350,500 |
| Materabu Jaya | 784,765 | 2,888,786 |
| Furada | 350,964 | 2,752,539 |

Source: Survey and Census by PSKK UGM, 2011

Tangguh LNG presence delivers positive impacts who live in Tofoi, Tanah Merah, Saengga and Onar villages, particularly regarding to the resettlement program in 2004-2005. Various income recovery programs have been launched to manage the impact of resettlement as well as the impact of safety exclusive zone enforcement.

Several trainings related to agriculture, fishing, carpentry, machine, workshop, business management and household management have been performed for locals. In 2005, there are 127 longboats of 15 HP given to the community of

Tanah Merah and Saengga. It also carried out training and mentoring fishing methods as well as provision of fishing nets.

In agriculture, agricultural technical training has been conducted for 24 farmers from Tanah Merah, Saengga, Onar, Tofoi and Babo in Agriculture Course for Farmers (KPPT) Salatiga. At this time, the area of agricultural land in two villages has reached 15.12 ha with 126 active farmers.

To date, Tanah Merah becomes a stocking point for vegetables, fruit and fish to feed Tangguh LNG's workforce. Management of food stocking is managed by Mayri Cooperative which also accommodates fruits, vegetables and fish productions from Saengga and Onar. Up to now, a total of 77.49 tons consists of agricultural and fishery products of which 11.23 tones are products throughout 2012.

Similarly, Tofoi is a stocking point for vegetable and seasonal fruit crops in order to provide foods for Tangguh LNG catering. Management of stocking points is managed by Imuri Cooperative. Until now, 170 tons of supply consists of vegetable and fruits products have been supply to Tangguh catering of which 53.84 tons are products throughout 2012.

Community Development

Since 2004, Tangguh LNG has run a COMDEV program in Tofoi Village. Furthermore, in recent years, its COMDEV program has also been implemented in the villages of Tanah Merah Baru, Saengga, Onar Baru Lama and Onar.

Through Participatory Planning (PBM), community development committee and community members put a development program for village together, according to needs and priorities. The program emphasizes on: 1) Infrastructure Development Program; 2) Educational Aid; 3) Health; 4) Women Empowerment; 5) Youth Program; 6) Economic Empowerment Program; 7) Religious and; 8) ATK and incentive organizers.

Through COMDEV activities, community is able to participate on development planning in accordance with the needs and priorities existed in the village. Furthermore, community is also able to implement and evaluate each of COMDEV program conducted in the village independently.

- **Local Business Growth**

Tanah Merah Baru (TMB) Village in Sumuri District has the second highest number of economic facilities after Irarutu III Village in Babo. TMB village has 15 kiosks / stalls and a market which sells commodities including plantation

crops, fisheries and agriculture (IPB, 2010). In Onar Lama Village, there are shrimp collectors to whom community accommodate their catch from the sea.

Table II-136 Type of Local Business in Sumuri District in 2011

| Type of Business | Tanah Merah Baru | |
|------------------|-----------------------|-------------------------|
| | Commodity Product (%) | Consumption Product (%) |
| Farming | 95 | 5 |
| Fishermen | 66 | 34 |
| Fishery | 95.8 | 4.2 |
| Agriculture | 100 | 0 |

Source : Food Security Survey by IPB, 2010



Figure II-202 KSU Mayeri (Business Cooperative Mayeri) Vegetable Supplies Unit in Tanah Merah Baru Village

- **Natural Resources Utilization**

Sumuri District region has three fishing grounds which are Tanah Merah, Saengga, and Onar Village (Unipa, 2006). Fishing targets consists of shrimp and fish. Community commonly sells shrimp in fresh condition, while fish is sold either in fresh or processed form.

The results of IPB's study on fishery in 2013, indicates type of fishery catches in Sumuri District includes shrimp, shark fins and bubbles fish. Community uses fishing gear such as nets and long line. Fishery products are marketed in Bintuni.

However, in rural areas, the most natural resources are agriculture and plantations. In Tofoi, the land use has followed industry pattern such on plantation and forestry companies. While in Padang Agoda Village and the two migrant villages, the land use follow the modern pattern and no longer limited to customary rights.

- **Transportation Facilities and Infrastructure**

- a. *Onar Lama*

Housing area in the village is only equipped with dirt road and footpaths infrastructure without adequate drainage. Port and jetty are not yet available although community is able to use the existing jetty at Onar Baru. There is a bridge connecting Onar Lama and Onar Baru Villages which still in good condition though frequently passed by.

In spite of occupied a village office, the activities of administrative services both head of the village and village officials are organized directly in villagers' home. The village office open every day (except Sunday). Moreover, village hall does not exist in the village.

This village only provides public facilities such as place of worship, except education and health facilities unless used existing facilities in Onar Baru Village. A Catholic church and a mosque are available on semi-permanent building in quite good condition.

There are only two kiosks / stalls that provide goods for household. Consequently, residents often shops to Central Village (Central Onar). To accommodate the fishery, fishermen typically utilize existing shrimp collectors in Onar Baru Village.

- b. *Onar Baru*

Road infrastructure in this village is a dirt road with adequate drainage. Infrastructure to support the activities of population administration is complete enough in this village. Among these are village office and village hall in good condition. Religious facilities available are Christian church that was built by Tangguh LNG and has quite well maintained.

For health facilities, there is a Pustu (Supporting Community Health Center), but the current condition of the building is badly damaged. Consequently, health staffs are currently living and serving treatment at church office. Both education and health facilities in this village are also used by Onar Lama Village.

Economy facilities only are available in the form of kiosks or stalls. There are six unit of kiosks / stalls that provide goods for households. Stall condition is quite varied and in general is not a permanent building. The main economic activities are shrimp collectors of which two collectors shrimp are selling of leading crawfish commodities in the village.

c. *Tanah Merah Baru*

The nearest village of Tanah Merah Baru (TMB) is Saengga Village. To reach Saengga of TMB, the population use longboat about 5-10 minutes. However, TMB is an important village because education and health facilities are available in the village.

Public facilities, such as village hall is also in good condition despite frequently used. Moreover, there is also a soccer field and volleyball court that can be used by community because of well maintained.

Population of TMB has five motorcycles, 13 *ketinting*, four boats and a rowboat. From these data, it concludes that land and water transportation are mostly accessed with more dominant number of water transportation ownership.

d. *Saengga*

Road infrastructure condition in Saengga Village is in good condition although it is still unpaved. Drainage channel has been available, but overgrown by weeds. There are three units of jetty that are owned by Tangguh LNG, shrimp companies and public jetty. The condition of three jetty are relatively good.

Infrastructure to support the administration and the population has been completely available in the village. There is a village office, a village hall, and a cooperative building. The condition of all buildings is less maintained because of rarely used. While the police station and cooperative are no longer operated.

Health facilities provided in this village is a Posyandu (Integrated Health Center) which actively offers services. Overall the Posyandu is in a good condition though the environment is less maintained.

Two units of Catholic Church, namely St. Francis Catholic Church and, St. Francis Xavier Catholic Church exist in this villages though no longer used for worship activities due to the lack infrastructure condition.

Economy facilities are only available in the form of kiosks or stalls. There are seven kiosks / stalls which sell regular daily needs, betel nut and agricultural products, such as vegetables and fruits. The sales product is derived from *ketinting*/merchant vessel from Bintuni.

The following number of transportation in Saengga are eight motorcycles, six bicycles, 15 *ketinting*, six rowboats and a traditional boat called as *sampan*. In brief, most people in this village of water transportation.

e. *Tofoi*

Roads and drainage in Tofoi Village are still inadequate, although it has been partially improved. Some roads also have been paved, but with poor quality. Therefore, during the rainy season, the roads are badly damaged and difficult to be accessed. There are no paved roads unless a typical dirt road.

In this village, there are several Government officials offices, including Sumuri District Office, Tofoi Village Office, and Village Hall of Tofoi. The condition of village office is quite good, and only little damage affected on this new building. Unlike the village office, village hall is in poor and outdated conditions, but is still able to be occupied by residents to do a variety of activities. In addition, for security service, there is a police station which is located adjacent to the district office.

The village has two units of market and a cooperative as a forum of economic activity. Market consists of traditional Market (market fish, vegetables, and fruits) and *Pasar Opsi* / Optional Market (special clothing and grocery markets). The location of these markets is quite far apart. These two markets have pretty good conditions with the building construction is typically made of wood. To support the economy of Tofoi community, there are 52 shops, 10 betel nuts sellers, and 20 market sellers.

f. *Padang Agoda*

This village is accessible by road takes about 1.5-2 hours from Tofoi. However, poor road conditions make it difficult to access villages, especially during the rainy season. There is no drainage system in the village, as well as the power grid and access to clean water.

Public facility provided in this village is a single unit of educational facilities (elementary school) and two churches. There are no health facilities and other rural infrastructure available in the village.

g. *Materabu Jaya*

Adequate public facilities are available in Materabu Jaya. There are village office, village cooperatives office, three mosques, a Catholic church, and two Christian churches. All the religious facilities are in good condition. Mosques are open daily for community, while Sunday service is also actively performed in

Christian and Catholic churches. Educational facilities are available only kindergarten (TK) and elementary school (SD) / Madrasah Ibtidaiyah School (MI).

Although the majority of population works as subsistence farmers of palm oil or vegetable, some of the villagers open as many as eight stalls / kiosks. In addition, there are also two cooperatives which play an important role in economic community. There is no market in this village for shopping activities; therefore, villagers should go to Tofoi taken approximately 45 minutes to buy personal needs and supplies for their stalls, as well as to sell agricultural products.

h. *Furada*

To support population administration service, village office and village are available in Forada Village. However, the village hall is not functioning for any activities due to destruction on its physical construction. According to public facilities availability in this village, there are village office, village hall, elementary school, junior high school, mosque, Christian Church, Catholic Church, soccer field, volleyball court, 20 units of kiosks / stalls and 15 market sellers.

- **Education**

Based on study conducted by PSKK-UGM in 2011, Sumuri has six elementary schools and three junior high schools. Elementary schools consist of SD Inpres Klp Dua SP 1, SD Inpres Klp Dua SP II, SD Inpres Tofoi, SD YPK Onar, SD YPK Serito Tanah Merah, dan SD YPPK Saengga. Meanwhile, for junior high school namely are SMP Perintis Kelapa Dua, SMP Stellamaris Tofoi and SMP YPK Tanah Merah.

The study also indicates similar number of students and classrooms in SD Inpres Klp Dua SP 1 as many as 201 students and six classrooms. It suggests that each class is able to accommodate 34 students. Furthermore, this school provides eight teachers which teach as many as 25 students individually based on ideal ratio. On the other hand, SD Inpres KLP Dua SP II has 175 students who undertake learning activities in seven classrooms (each class accommodates 25 students). Moreover, eight teachers in this school are assumed having responsibility of teaching as many as 22 students.

SD Inpres Tofoi has 284 students within six classrooms which have ideal capacity of 47 students for each classroom. Teaching and learning activities supported by six teachers, so it is assumed every teacher should ideally teach as many as 22 students. SD YPK Onar has a total of 96 students who study in three

classes. While teachers are available at the elementary school as well as eight people; therefore each teacher has responsibility to teach 16 students.

SD YPK Serito has been developed into a pilot elementary school. SD YPK Serito located in Tanah Merah and has 151 students studying in six classrooms. According to the number of classrooms, the ideal capacity of each class is 25 students. There are six teachers work in this school who individually responsible to teach 25 students. Next to SD YPK Serito, there is a SD YPPK Saengga that has 137 students studying in six different classrooms. Having eight teachers, each teacher is able to accommodate 17 students ideally on teaching-learning activities.

SMP Perintis Kelapa Dua has 108 students studying in three different classrooms, so that each class is assumed to ideally accommodate 36 students. On the other hand, there are ten teachers who are assumed to teach 11 students of each of them. On the other hand there are 100 students studying in three classrooms at the junior Stellamaris Tofoi, it is assumed that each class can accommodate 33 students. There are six teachers who teach at the junior high, so that each teacher teaches assumed to bear as many as 17 students. SMP YPK Tanah Merah only has 86 people taught in six different classrooms, so that each class has an ideal capacity for 14 people. On the other hand, there are five teachers who teach at the school, so that every teacher is assumed to bear 17 students ideally.

Table II-137 Total of School in Sumuri District in 2011

| No. | School | Total of Student | Classroom | Class-Student Ratio | Total of Teacher | Teacher-Student Ratio |
|-----|-------------------------|------------------|-----------|---------------------|------------------|-----------------------|
| 1 | SD Inpres Klp Dua SP I | 201 | 6 | 33.5 | 8 | 25.1 |
| 2 | SD Inpres Klp Dua SP II | 175 | 7 | 25 | 8 | 21.9 |
| 3 | SD Inpres Tofoi | 284 | 6 | 47.3 | 6 | 47.3 |
| 4 | SD YPK Onar | 96 | 3 | 32 | 6 | 16 |
| 5 | SD YPK Serito | 151 | 6 | 25.2 | 6 | 25.2 |
| 6 | SD YPPK Saengga | 137 | 6 | 22.8 | 8 | 17.1 |
| 7 | SMP Perintis Kelapa Dua | 108 | 3 | 36 | 10 | 10.8 |
| 8 | SMP Stellamaris Tofoi | 100 | 3 | 33.3 | 6 | 16.7 |

Source : Survey and Census by UGM, 2011

The tables above show that in Teluk Bintuni Regency, especially in these districts, elementary schools have the largest quantity of students to be accommodate as well as fulfill the needs of education in the regency. Based on these data, Teluk Bintuni Regency has not provided proper education access either on junior high school or above education levels. Most of schools

have inadequate numbers of teachers both in quantity and quality. Even for some schools, they have no permanent teachers unless hired temporary teachers from other school. Consequently, this suggests heavier burden to the teachers, and potentially lead to a decrease in the quality of teaching. In addition, it is inappropriate to the proportion of national eligibility on student-teacher ratio, which refers to the Government Regulation no. 74 Year 2008 Article 17 in the amount of 20:1 in elementary, junior high and high school - every single teacher has the responsibility of teaching ideally as many as 20 students.



Figure II-203 SD YPK in Saengga Village (YPK Elementary School)

f. Kamundan District

- **Demographic and General Overview**

Kamundan District (Kalitami II as its capital city) has five villages which two villages are new village as a result of village division of Aranday District. Compared to other districts in Teluk Bintuni Regency, this district has small area which is 572 km². Sebyar tribe initially dwells in the district, and also the owner of customary rights. Nevertheless, to date, the composition of its population, relatively varied, i.e. Sebyar tribe, Bugis tribe, Sumatra, Java, Buton, and Merauke. The villages in this district are not included in the governance program conducted by Tangguh LNG in cooperation with Local Government of Teluk Bintuni Regency and PSKK-UGM at this time.



Figure II-204 Villages in Kamundan District

Total of Population

The total of population in Kamundan District is 914 inhabitants, and most of them are in the village of Kalitami I. Meanwhile, Bibiram and Kenara Village is a new village which was expanded due to small number of population. The average population density is only 1.60 people per km².

Table II-138 Total Population in Kamundan District in 2012

| No. | Village | Population (Inhabitant) | | | | Sex Ratio |
|-----|-------------|-------------------------|------|--------|-------|-----------|
| | | Household | Male | Female | Total | |
| 1 | Kalitami II | 70 | 137 | 253 | 390 | 54.15 |
| 2 | Kalitami I | 74 | 222 | 227 | 449 | 97.8 |
| 3 | Kenara | 8 | 16 | 19 | 35 | 84.21 |
| 4 | Bibiram | 9 | 16 | 24 | 40 | 66.67 |

Source : Central Bureau of Statistics, Kamundan District in Figure, 2012

Before the district division, Kamundan District is included in Aranday District. Then the villages in this new district is formerly expanded from Kalitami Village as Main Village.

Table II-139 Total Population in Kamundan District in 2002, 2009, 2011

| No. | Village | Population (Inhabitant) | | |
|-----|----------|-------------------------|-------------------|-------------------|
| | | 2002 ¹ | 2009 ² | 2012 ³ |
| 1 | Kalitami | 514 | - | 449 |

Source : 1 AMDAL Tangguh LNG 2002; 2 Social Economic Survey in DAVs by UGM 2009; 3 Central Bureau of Statistics, Kamundan District in Figure 2012

Population Structure

a. Age

Population data on Kamundan District showed that the population of productive age (15-60 years) is relatively high, reaching 49.77% of the total population. The amount of the productive age percentage is potential to the implementation of development in Kamundan District and specifically villages in Kamundan District.

Table II-140 Population Structure by Age in Kamundan District in 2012

| Age | Male | Female | Total |
|--------------|------------|------------|------------|
| 0 - 4 | 73 | 65 | 138 |
| 5 - 9 | 54 | 56 | 110 |
| 10.-14 | 39 | 35 | 74 |
| 15-19 | 27 | 33 | 60 |
| 20-24 | 11 | 30 | 41 |
| 25-29 | 31 | 30 | 61 |
| 30-34 | 16 | 31 | 47 |
| 35-39 | 26 | 17 | 43 |
| 40-44 | 11 | 14 | 25 |
| 45-49 | 15 | 13 | 28 |
| 50-54 | 9 | 8 | 17 |
| 55-59 | 4 | 4 | 8 |
| 60-64 | 5 | 2 | 7 |
| 65-69 | 1 | 2 | 3 |
| 70-74 | - | - | - |
| > 75 | - | 1 | 1 |
| Total | 322 | 341 | 663 |

Source : Central Bureau of Statistics of Teluk Bintuni Regency in 2012

b. Religion

Residents in Kamundan District largely embraced Islam, particularly, Kenara and Bibiram Villages which all inhabitants are Islam. Other religions professed by the villagers are Christian with only small number in Kalitami I and Kalitami II villages.

Table II-141 Population Structure by Religion in Kamundan District in 2012

| No. | Village | Religion | | | | |
|-----|-------------|----------|-----------|----------|-------|--------|
| | | Islam | Christian | Catholic | Hindu | Buddha |
| 1 | Kalitami II | 99.11% | 0.89% | - | - | - |
| 2 | Kalitami I | 97.69% | 2.31% | - | - | - |
| 3 | Kenara | 100% | - | - | - | - |
| 4 | Bibiram | 100% | - | - | - | - |

Source : Central Bureau of Statistics of Kamundan District in figure, 2012

- **Pattern of Livelihood and Income Level**

Labor and Livelihood

Most of villagers in this district work on agriculture and partially on fisheries sector due to its geographical location in the north shore of Bintuni Bay and along the Kamundan River. Agricultural commodities that are commonly cultivated by villagers are cocoa, nutmeg and coconut. While in the fisheries sector, Kamundan fishermen has fishing grounds along the Siagian trench to Estuary Kamundan on the Bintuni Bay shore.

Total of Kamundan population are 914 people spread in 70 households. Workforce on productive age (14 - 60 years) recorded as 330 inhabitants or 49.77% of the total of population in Kamundan District. The amount is recognized quite large, also potentially affects the development process in this district.

Economic Activity

The geographical site of Kamundan is distant from the economic growth center, causing the economic activity of this region is less developed. Economic activity is prominent in fisheries sector. Kiosks and shops are generally owned and managed by migrants. Subsistence agricultural activities are also conducted by some of the people in this district.

- **Local Business Growth**

Economic facilities provided in the district are still very limited. Although each village has a kiosk, it sells limited number and type of daily necessities. The market development is still ongoing process through PNPM (National Program for Community Empowerment) program. The location of Kamundan District's market is right in front of small jetty, which is expected to be a trigger of economic growth point of village communities in Kamundan. In addition, there are 15 kiosks / stalls and one cooperative in this district.

Types of businesses owned by residents of Kamundan District include fisheries, food crops, plantations and livestock. Community mostly develops products such as shrimp, salted fish and snapper. Meanwhile, the agricultural commodity crops consist of vegetables (spinach, *kangkung*, green beans, peppers, etc.). Plantation crops comprises of durian, cacao, *rambutan*, nutmeg, coconut, mango *rambutan*, bark (*salak*), and bananas. In general, livestock activities are seeking for goats and chickens.

- **Natural Resources Utilization**

Community housing in Kamundan are generally located on the edge of Kamundan River. The presence of this river becomes an important factor for fishermen.

Type of fishing catches are fish and shrimp, which are more commonly utilized for food consumption than commodities sold for a source of income. Agriculture and plantation sectors become potential business because a small number of people in Kamundan have been developing various agricultural and plantation commodities, although still small scale.

Natural resources such as land is commonly exploited to be forest which is utilized for sago planting and hunting. On the other hand, agricultural and plantation is limited unless utilizing tidal lands.

- **Transportation Facilities and Infrastructure**

The ongoing process of market development presents development of economic infrastructure in Kamundan District. This development completes other former public infrastructure, such as schools and health centers. However, the infrastructure is centralized in Kalitami II which is the "entrance" through jetty all at once.



Figure II-205 Market Construction located at Kamundan District

Meanwhile, other economic infrastructure includes electrification. The electricity power generated by several generators, which would require expensive fuel.

In addition, means of transportation available to residents consist of one piece of 200 PK-powered speedboat and five longtail boats / *ketinting*. Due to its geographical site, Kamundan District does not seem to improve its land transportation infrastructure.

- **Education**

Based on Central Bureau of Statistics figure in 2012, Kamundan District only has two schools, namely SD Negeri Satu Atap and SMP Negeri Satu Atap.



Figure II-206 SMP Negeri Satu Atap in Kamundan District (Negeri Satu Atap Junior High School)

SD Negeri Satu Atap has 171 students learning in 14 classrooms, therefore, every class should ideally accommodate as many as approximately 12 students. On the other hand, there are nine teachers who teach these students. It assumed a teacher has the responsibility of teaching as many as 19 students.

SMP Negeri Satu Atap (junior high school) has a total enrollment of 93 students studied only in two classrooms. Approximately 47 students are ideally accommodated in each classroom. It also has six teachers which are responsible to teach more less 15 students.

Table II-142 Total of School in Kamundan District in 2011

| No. | School | Total of Student | Classroom | Class-Student Ratio | Total of Teacher | Teacher-Student Ratio |
|-----|----------------------|------------------|-----------|---------------------|------------------|-----------------------|
| 1 | SD Negeri Satu Atap | 171 | 14 | 12.2 | 9 | 19 |
| 2 | SMP Negeri Satu Atap | 93 | 2 | 46.5 | 6 | 15.5 |

Source : Survey and Census by UGM, 2011

g. Aranday District

- **Description and General Overview**

Aranday District consists of four villages. The total area of Aranday District is 572.01 km² or 3.07% of the entire Teluk Bintuni Regency. Topography of Aranday District is a valley / watershed, which directly adjacent to Sebyar River. Aranday district is bordered by four other districts, namely South Moskona, Bintuni, Tomu, and Weriagar.

Aranday District is divided into four villages, namely Aranday, Kecap, Manunggal Karya, and Kampung Baru. In addition, there are four expanded villages division, namely Kandarín, Botenik, Irida, and Yakora.



Source : YPTB 2008

Figure II-207 Road Condition and Several Village Facilities in Aranday District

Total of Population

According to census data of population in 2010, the district population is as much as 1055 inhabitants with sex ratio consisted of 533 males and 545 females inhabitants as well as 238 households.

Table II-143 Total Population in Aranday District in 2010

| No. | Village | Population (Inhabitant) | | | |
|-----|---------|-------------------------|------|--------|-------|
| | | Household | Male | Female | Total |
| 1 | Aranday | 96 | 197 | 209 | 406 |
| 2 | Kecap | 63 | 138 | 155 | 293 |

| No. | Village | Population (Inhabitant) | | | |
|--------------|-----------------|-------------------------|------------|------------|-------------|
| | | Household | Male | Female | Total |
| 3 | Manunggal Karya | 23 | 47 | 49 | 96 |
| 4 | Kampung Baru | 56 | 128 | 132 | 260 |
| Total | | 238 | 510 | 545 | 1055 |

Source : Central Bureau of Statistics, Aranday District in figure 2013

Population Structure

a. Age

According to sex ratio data in 2012, Aranday District is dominated by children aged 0-4 years, amounting to 189 inhabitants with number of males and females consisted of 100 inhabitants and 89 inhabitants.

Table II-144 Total Population of Aranday District by Sex and Age Group in 2012

| No. | Age | Population (Inhabitant) | | |
|--------------|-------|-------------------------|------------|-------------|
| | | Male | Female | Total |
| 1 | 0-4 | 100 | 89 | 189 |
| 2 | 5-9 | 94 | 104 | 198 |
| 3 | 10-14 | 67 | 69 | 136 |
| 4 | 15-19 | 30 | 47 | 77 |
| 5 | 20-24 | 32 | 44 | 76 |
| 6 | 25-29 | 41 | 58 | 99 |
| 7 | 30-34 | 35 | 32 | 67 |
| 8 | 35-39 | 32 | 40 | 72 |
| 9 | 40-44 | 26 | 18 | 44 |
| 10 | 45-49 | 21 | 15 | 36 |
| 11 | 50-54 | 12 | 12 | 24 |
| 12 | 55-59 | 9 | 5 | 14 |
| 13 | 60-64 | 1 | 4 | 5 |
| 14 | 65-69 | 9 | 4 | 13 |
| 15 | 70-74 | 3 | 3 | 6 |
| 16 | 75+ | 3 | 6 | 9 |
| 17 | TT | 0 | 0 | 0 |
| 18 | NA | 0 | 0 | 0 |
| Total | | 515 | 550 | 1065 |

Source : The Central Bureau of Statistics, Aranday District in figure 2013

b. Religion

Based on data from the Central Bureau of Statistics of Teluk Bintuni Regency, 100% of the population in Aranday District embrace Islam.

Table II-145 Population Structure by Religion in Kamundan District in 2012

| No. | Village | Agama | | | | |
|--------------|-----------------|-------------|-----------|----------|----------|----------|
| | | Islam | Christian | Catholic | Hindu | Buddha |
| 1 | Aranday | 416 | - | - | - | - |
| 2 | Kecap | 293 | - | - | - | - |
| 3 | Manunggal Karya | 96 | - | - | - | - |
| 4 | Kampung Baru | 260 | - | - | - | - |
| Total | | 1065 | - | - | - | - |

Source : The Central Bureau of Statistics, Aranday District in figure 2013

- **Pattern of Livelihood and Income Level**

Labor and Livelihood

About 93.2% of community work on agriculture sector, Agricultural consists of food crops, such as grains, and vegetables and fruits. Food crops in paddy fields generate cassava, sweet potatoes, peanuts, chili, *kangkung*, and spinach. As for fruit trees and vegetable plants generate guava, papaya and *rambutan* annually.

Table II-146 Percentage of Agricultural Family by Village in Aranday District in 2010

| No. | Village | Percentage of Agricultural Family (%) |
|-----|-----------------|---------------------------------------|
| 1 | Aranday | 90 |
| 2 | Kecap | 90 |
| 3 | Manunggal Karya | 90 |
| 4 | Kampung Baru | 98 |

Source : The Central Bureau of Statistics, Aranday District in figure 2013

Table II-147 Harvested Area, Production and Average Crops Production in Aranday District in 2012

| No. | Type of Crop | Harvested Area | Production | Production Average |
|------|--------------|----------------|------------|--------------------|
| 1 | Corn | 2 | 2.4 | 1.2 |
| 2 | Cassava | 1 | 9 | 9 |
| 3 | Sweet Potato | 1 | 5.5 | 5.5 |
| 2012 | | 4 | 16.9 | 15.7 |
| 2011 | | 4 | 4.32 | 15.2 |

Source : The Central Bureau of Statistics, Aranday District in figure 2013

Table II-148 Annual Production and Average Fruits Production in Aranday District in 2012

| No. | Type of Crop | Total of Trees | Production | Production Average |
|-----|--------------|----------------|------------|--------------------|
| 1 | Guava | 13 | 2 | 6.5 |
| 2 | Siam Orange | 97 | 4 | 24.25 |
| 3 | Mango | 12 | 9 | 1.3 |

| | | | | |
|--------------|-----------|-----------|------------|--------------|
| 4 | Jackfruit | 8 | 5 | 1.6 |
| 5 | Papaya | 20 | 7 | 2.8 |
| 6 | Rambutan | 10 | 5 | 2 |
| Total | | 89 | 2.1 | 38.45 |

Source : The Central Bureau of Statistics, Aranday District in figure 2013

Table II-149 Annual Production dan Average Vegetables Production in Aranday District in 2012

| No. | Type of Crop | Harvested Area | Production | Production Average |
|-----|--------------|----------------|------------|--------------------|
| 1 | Tomato | - | 48 | 48 |
| 2 | Bean | 3 | 5.5 | 1.83 |
| 3 | Chili | 4 | 46 | 15.3 |
| 4 | Kangkung | 6 | 77 | 12.83 |
| 5 | Spinach | 4 | 4 | 1 |
| 6 | Cucumber | 16 | - | - |
| | 2012 | 32 | 180.5 | 78.96 |
| | 2011 | 12 | 13.75 | 5.2 |

Source : The Central Bureau of Statistics, Aranday District in figure 2013

- **Education**

In 2011, education facilities in the district consist of a kindergarten, four elementary schools and one junior high school. One of success key of education is the availability of adequate teaching staff for each level of education. Student-teacher ratio is one indicator that describes teaching level of a teacher to his students. Student-teacher ratio for kindergarten was at 7.3, and for student-teacher ratio of ECD was at 8.6. Furthermore, student-teacher ratio for elementary school was at 47.6, while junior high school was at seven.

Table II-150 Total of Schools in Aranday District by Village in 2012

| No. | Village | Kindergarten | SD (Elementary School) | SMP (Junior High School) | | SMA (High School) | |
|-----|--------------------|--------------|------------------------------|--------------------------------|------------|----------------------|------------|
| | | | | Public | Vocational | Public | Vocational |
| 1 | Aranday | - | 1 | 1 | - | - | - |
| 2 | Kecap | 1 | 1 | - | - | - | - |
| 3 | Manunggal Karya | -- | 1 | - | - | - | - |
| 4 | Kampung Baru | 1 | 1 | - | - | - | - |

Source : The Central Bureau of Statistics, Aranday District in figure 2013



Source : YPTB 2008

Figure II-208 Elementary schools in Aranday District consist of SD Inpres Aranday, SD Inpres Kecap, SD Inpres Kampung Baru, and SD Inpres HTI II Manunggal



Figure II-209 SMP Negeri Babo (Babo Junior High School)

Table II-151 Total of Schools in Babo District in 2011

| No. | School | Total of Student | Classroom | Class-Student Ratio | Total of Teacher | Teacher-Student Ratio |
|-----|-----------------------|------------------|-----------|---------------------|------------------|-----------------------|
| 1 | SD Inpres Babo | 284 | 8 | 35.5 | 12 | 23.7 |
| 3 | SD Nurul Falaq Asmanu | 79 | 4 | 19.8 | 4 | 19.8 |
| 4 | SD YPPK Babo | 163 | 7 | 23.3 | 7 | 23.3 |
| 5 | SMP Negeri Babo | 247 | 8 | 30.9 | 17 | 14.5 |
| 6 | SMA Persiapan Babo | 158 | N/A | N/A | 16 | 9.9 |

2.3.1.2 Fakfak Regency

- **Description and General Overview**

Fakfak is one of the oldest regency in Papua and historically can be traced from pre-independence Indonesia. In the 16th century and 18th, Fakfak was under the Sultan of Tidore. At this time, the regency is divided into nine districts and 118 villages. The district capital is also named Fakfak and located in District / City of Fakfak.

Based on the statistic data in 2012, Fakfak population is amounted to 66,828 inhabitants, which consisted of 35,409 men and 31,419 women with a ratio of male to female was 1.13 (the Central Bureau of Statistics of Fakfak Regency, 2011). With a total area of 14,320 km², the population density of Fakfak was 4.67 inhabitants/km². Fakfak District has the highest number of population, amounting to 33,174 people (49.85% of the total population of Fakfak Regency), with a population density of 40.46 inhabitants/km². Eastern part of the regency has the lowest number of inhabitants, amounting to 2,992 (3.87%) with a density of 1.74 inhabitants/km².

Some villages included in AMDAL studies are located within Bomberay and Kokas Districts.

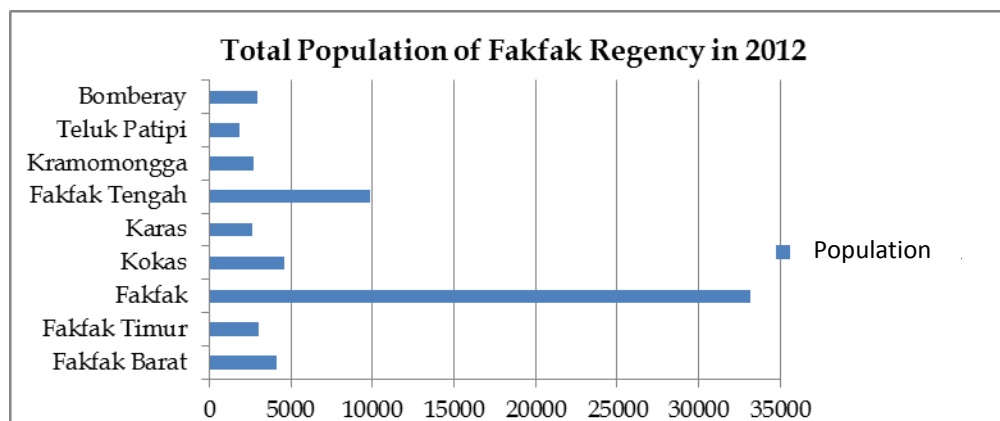


Figure II-210 Total Population of Fakfak Regency in 2012

Total of Population

Based on the statistic data in 2012, Fakfak population is amounted to 66,828 inhabitants, which consisted of 35,409 males and 31,419 females with a ratio of male to female was 1.13 (the Central Bureau of Statistics of Fakfak Regency, 2011). With a total area of 14,320 km², the population density of Fakfak was 4.67 inhabitants/km². Fakfak District has the highest number of population, amounting to 33,174 people (49.85% of the total population of Fakfak Regency), with a population density of 40.46 inhabitants/ km². Eastern part of the regency has the lowest number of inhabitants, amounting to 2,992 (3.87%) with a density of 1.74 inhabitants/km². Total population, population density and distribution in each district in Fakfak Regency are shown in **Table II-157**.

Table II-152 Total, Density, dan Distribution of Population in Fakfak Regency by District (2010)

| No. | District | Population (Inhabitant) | | | Total Area (km ²) | Sex Ratio | Population Density (Inhabitants/km ²) | Population Distribution (%) |
|---|---------------|-------------------------|------------------|------------------|-------------------------------|--------------|---|-----------------------------|
| | | Male | Female | Total | | | | |
| 1 | Fakfak Barat | 2,103.00 | 2,019.00 | 4,122.00 | 1,685.00 | 1.04 | 2.45 | 4.57 |
| 2 | Fakfak Timur | 1,568.00 | 1,424.00 | 2,992.00 | 1,721.00 | 1.10 | 1.74 | 3.87 |
| 3 | Fakfak | 17,611.00 | 15,563.00 | 33,174.00 | 820.00 | 1.13 | 40.46 | 49.85 |
| 4 | Kokas | 2,423.00 | 2,187.00 | 4,610.00 | 1,786.00 | 1.11 | 2.58 | 14.69 |
| 5 | Karas | 1,382.00 | 1,215.00 | 2,597.00 | 2,491.00 | 1.14 | 1.04 | 6.08 |
| 6 | Fakfak Tengah | 5,110.00 | 4,762.00 | 9,872.00 | 705.00 | 1.07 | 14.00 | 6.83 |
| 7 | Kramongmongga | 1,423.00 | 1,314.00 | 2,737.00 | 1,478.00 | 1.08 | 1.85 | 5.66 |
| 8 | Teluk Patipi | 1,957.00 | 1,817.00 | 3,774.00 | 1,724.00 | 1.08 | 2.19 | 4.08 |
| 9 | Bomberay | 1,832.00 | 1,118.00 | 2,950.00 | 1,910.00 | 1.64 | 1.54 | 4.38 |
| Total Population of Fakfak Regency | | 35,409.00 | 31,419.00 | 66,828.00 | 14,320.00 | 10.39 | 4.67 | 100.00 |

Source : Fakfak Regency in Figure, 2011; The Central Bureau of Statistics of Fakfak Regency 2011

Population Structure

Table II-158 shows the population structure of Fakfak Regency by age group and sex. The highest age group is 0-4 years amounted to 12.28%. Meanwhile, the age group >75 years is the smallest population as only 0.45%. Toddler age (0-4 years), children (5-9 years) and adolescents (10-14 years) reach the highest total population which is one third of the total population (34.82%).

Table II-153 Total Population in Fakfak Regency in 2010 by Age Group and Productivity

| Age Group | Sex | | Total | % | Productivity Categories |
|--------------|--------------|---------------|----------------|----------------|----------------------------|
| | Male | Female | | | |
| 0-4 | 4,271.00 | 3,936.00 | 8,207.00 | 12.28% | 34.82% (Non-Productive) |
| 5-9 | 4,203.00 | 3,894.00 | 8,097.00 | 12.12% | |
| 10-14 | 3,625.00 | 3,338.00 | 6,963.00 | 10.42% | |
| 15-19 | 2,987.00 | 2,864.00 | 5,851.00 | 8.76% | 63.36% (Productive) |
| 20-24 | 3,447.00 | 3,077.00 | 6,524.00 | 9.76% | |
| 25-29 | 3,751.00 | 3,259.00 | 7,010.00 | 10.49% | |
| 30-34 | 3,286.00 | 2,781.00 | 6,067.00 | 9.08% | |
| 35-39 | 2,551.00 | 2,293.00 | 4,844.00 | 7.25% | |
| 40-44 | 2,167.00 | 1,916.00 | 4,083.00 | 6.11% | |
| 45-49 | 1,803.00 | 1,435.00 | 3,238.00 | 4.85% | |
| 50-54 | 1,234.00 | 1,050.00 | 2,284.00 | 3.42% | |
| 55-59 | 865.00 | 636.00 | 1,501.00 | 2.25% | |
| 60-64 | 552.00 | 387.00 | 939.00 | 1.41% | |
| 65-69 | 353.00 | 25.00 | 606.00 | 0.91% | 1.82% (Non-Productive) |
| 70-74 | 150.00 | 162.00 | 162.00 | 0.47% | |
| 75+ | 166.00 | 135.00 | 301.00 | 0.45% | |
| Total | 1,666 | 31,416 | 66,6775 | 100.00% | 100.00% |

Source : ERM Analysis, 2012 from Fakfak Regency in Figure, 2011

Non-productive age population (<14 years and > 64 years) in Fakfak amounted to 36.64%, while the population of reproductive age (14-65 years) amounted to 64.36%. This shows that the dependency ratio between the non-productive age population and productive by 57.83%, similar to that occurring in Teluk Bintuni Regency, the population of productive age bears the non-productive age.

Similar to Fakfak, the majority of population embraced Islam (59.02%), followed by Christian (21.40%) and Catholic (19.30%).

Table II-154 Religion Distribution in Fakfak Regency in 2010

| No. | Religion | Percentage of each Religion in Regency(%) |
|-----|-----------|---|
| | | Fakfak |
| 1 | Christian | 21.40 |
| 2 | Islam | 59.02 |
| 3 | Catholic | 19.30 |

| No. | Religion | Percentage of each Religion in Regency(%) |
|--------------|----------|---|
| | | Fakfak |
| 4 | Hindu | 0.21 |
| 5 | Buddha | 0.07 |
| 6 | Konghucu | - |
| Total | | 100.00 |

Source : The Central Bureau of Statistics of Teluk Bintuni and Fakfak Regencies

- **Pattern of Livelihood and Income Level**

- Labor and Livelihood

Livelihood characteristics in Fakfak Regency tend to be varied rather than in Teluk Bintuni Regency. In addition to fishery, mining and service sectors, community of Fakfak Regency also work in agricultural and plantation sectors. Fakfak Regency in Figure 2012 recorded community products in agricultural and plantation contribute huge total of number. In 2011, agriculture products reached 449.6 tons, with soy bean as the best product. Meanwhile, plantation sector reached 2,444.3 tons of which nutmeg is the best product.

- **Local Business Growth**

Based on statistics data of Fakfak in Figures, the most implemented trading type is small-scale trading, such as carpentry, household appliances, as well as nutmeg sweets and syrup.

Table II-155 Total of Entrepreneurs by SIUP (Trading Business License) and Company Accepted TDP (Certificate of Company Registration) in Fakfak Regency, 2006-2010

| Description | 2006 | 2007 | 2008 | 2009 | 2010 |
|--|------|------|------|------|------|
| Division of Business Group by Business Capital | | | | | |
| Limited Liability Company | 5 | 4 | 8 | 18 | 19 |
| Cooperative | 1 | 1 | 3 | 5 | 3 |
| CV | 75 | 121 | 172 | 102 | 64 |
| Firm | - | - | 1 | 1 | - |
| Private | 93 | - | 95 | 149 | 123 |
| Others | - | 247 | - | - | - |

Source : Fakfak Regency in Figure 2011, Trade and Industries Institution of Fakfak Regency

Table II-156 Total of Entrepreneurs by SIUP (Trading Business License) and Company Accepted TDP (Certificate of Company Registration) in Fakfak Regency, 2006-2010

| Description | 2006 | 2007 | 2008 | 2009 | 2010 |
|--|------|------|------|------|------|
| Division of Business Group by Legal Status | | | | | |
| Wholesaler | 5 | 7 | 21 | 10 | 10 |
| Middle Scale Trading | 27 | 19 | 56 | 58 | 36 |
| Small Scale Trading | 142 | 333 | 202 | 212 | 136 |
| TDP | 174 | 373 | 282 | 274 | 209 |

| | | | | | |
|------|-----|-----|-----|-----|-----|
| SIUP | 174 | 359 | 279 | 280 | 209 |
|------|-----|-----|-----|-----|-----|

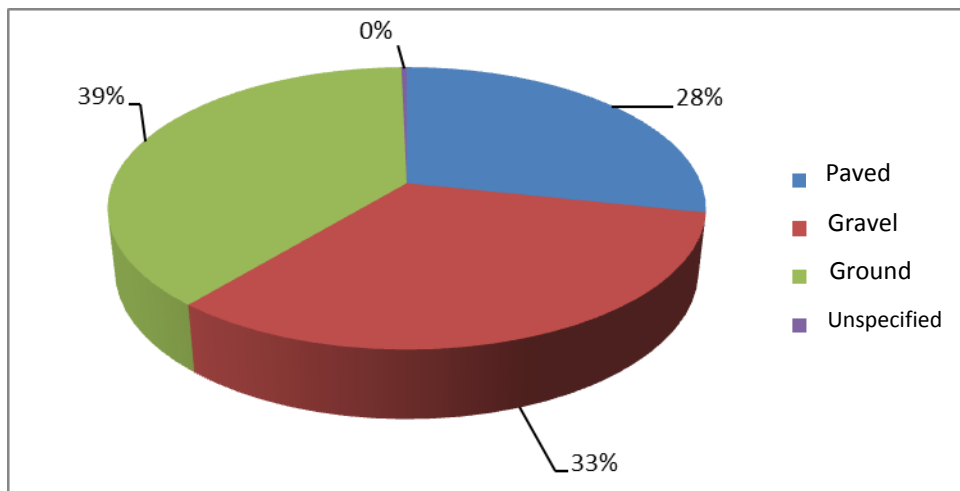
Source : Trade and Industries Institution of Fakfak Regency 2011

- **Natural Resources Utilization**

Similar to Teluk Bintuni Regency, Fakfak community largely depends on fisheries resources. Most of fishing activity is a traditional fishing but also aquaculture such in Arguni. The community cultivate fish also seaweed and pearl oysters.

- **Transportation Facilities and Infrastructure**

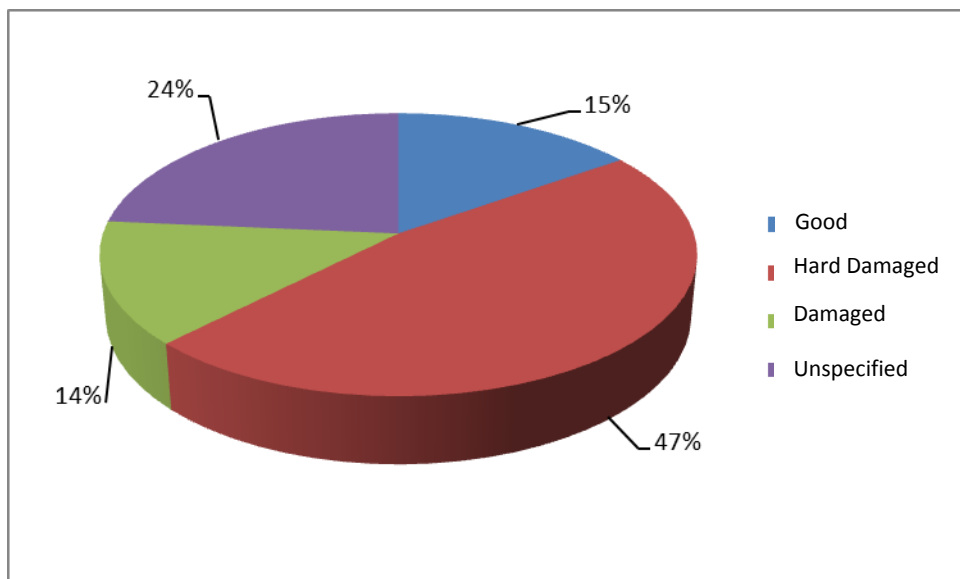
Road infrastructure is also available, both state road and provincial road. The total length of roads is 832.832 km, with the details as shown below:



Source : Department of Public Affairs of Fakfak Regency

Figure II-211 Road Facilities and Infrastructure

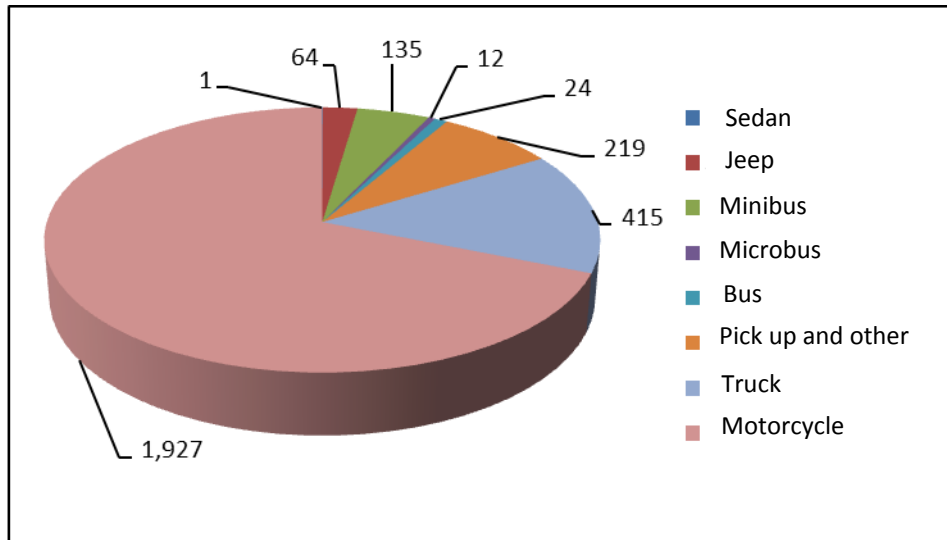
Meanwhile, the road condition in Fakfak Regency can be described approximately 47% of the total length of roads were damaged, namely 116.829 km² of which 58.34 kilometers are in good condition.



Source : Department of Public Affairs of Teluk Bintuni Regency

Figure II-212 Road Condition

Public transport is available as a minibus, micro buses, buses and etc. Overview of number of motor vehicles available in Teluk Bintuni Regency as below:



Source : Department of Public Affairs of Teluk Bintuni Regency

Figure II-213 Total of Motor Vehicle

Sea Transportation

Fakfak region is a watershed area passed by various types of commercial shipping both from within the country and from abroad. Based on statistics data from Fakfak Regency in 2012 as shown in **Table II-162** is that number of various types of cruise ships in port of Fakfak respectively were 443 and 617 ships in 2010 and 2011. Meanwhile foreign ships visits in 2010 and 2011 were 30 and 202 ships respectively. Regular boat (PT.Pelni), namely KM Tatamailau serving cruise once a week and KM Nggapulu serving cruise two weeks connecting port cities in Papua and outside Papua. In addition, there are ships that carry food needs, building materials including vehicles known as merchant vessel (cargo ship) for large tonnage ships and optional vessel with small tonnage of about 15 tons.

Table II-157 Total Number of Visits by Shipping Types in Fakfak Port

| No. | Month | Non Commercial | Nusantara (Domestic) | Perintis (Regular) | Community | Foreign | Total |
|-----|----------|----------------|----------------------|--------------------|-----------|---------|-------|
| 1 | January | 29 | 23 | 2 | - | - | 54 |
| 2 | February | 17 | 21 | 11 | 6 | 6 | 61 |
| 3 | March | 10 | 15 | 8 | 1 | 3 | 37 |
| 4 | April | 20 | 17 | 13 | 9 | 4 | 63 |
| 5 | May | 13 | 19 | 9 | 4 | 10 | 55 |
| 6 | June | 12 | 12 | 7 | 4 | 4 | 39 |
| 7 | July | 22 | 21 | 8 | 4 | 6 | 61 |

| No. | Month | Non Commercial | Nusantara (Domestic) | Perintis (Regular) | Community | Foreign | Total |
|-------------------|-----------|----------------|----------------------|--------------------|-----------|-----------|------------|
| 8 | August | 22 | 23 | 6 | 4 | 6 | 61 |
| 9 | September | 20 | 9 | 9 | - | 9 | 47 |
| 10 | October | 16 | 16 | 5 | 4 | 7 | 48 |
| 11 | November | 16 | 5 | 7 | 4 | 6 | 38 |
| 12 | December | 13 | 21 | 8 | 1 | 10 | 53 |
| Total 2011 | | 210 | 202 | 93 | 41 | 71 | 617 |
| Total 2010 | | 242 | 30 | 97 | 74 | - | 443 |

Source : Fakfak Regency in Figure 2012.

Community regularly moves between villages also to the center of area administrative and economic activities. In accessing education and health services, through sea transportation, Kokas community goes to some village such as Arguni, Darembang, Fior, Forir and other surrounding villages. According to LPPM IPB 2013, total number of sea transportation owned by households in Fakfak is similar to Teluk Bintuni Regency, which consists of *sampan*, canoe /sail boat, *ketinting*, and longboat.

- **Education**

In addition to community of Teluk Bintuni Regency, education program has also conducted in Fakfak Regency particularly in Otoweri and Tomage Villages in Bomberay District as well as Kokas District. For Kokas District, education program will only covers villages of Ugar, Arguni, Taver, Andamata, Fior, Furir, Darembang, Goras, Kokas, Kampung Baru, Sisir, Sekar, and Kinam.

Tanggung LNG will work together with other parties, with the involvement of various stakeholders relevant to the improvement of education program in Kokas District in terms of capacity building of educational services, as well as increased demand and awareness for education Kokas District.

Fakfak community tend to have good awareness of education demand. This is proved by public consultation result undertaken in 2012, in which one of the community aspirations foremost is the problem of availability of facilities and infrastructure as well as proper education. Community also complained of difficulty access of their children to reach a decent education. Based on this aspiration, Fakfak community suggests that scholarships should be granted to their children in order to get a proper education at various levels.

- a. **Bomberay District**

- **Description and General Overview**

Bomberay District is located in North Shore of Fakfak Regency or the Southern part of Bintuni Bay. The total area of this district is 1,910 km²; bordered by the

sea on the North, West, and South. Only the eastern part has land borders by the Southern of Teluk Bintuni Regency.

Bomberay region is divided into 11 villages, mostly in coastal areas. Surveyed villages are namely Otoweri and Tomage. Both villages are located in the North Shore bordered by Teluk Bintuni Regency.

In 2001, the two villages are united in Toweri Village. In 2003, the village was divided into Otoweri and Tomage. Although Indigenous People* living in Bomberay are generally part of Mbaham tribe, the two villages have distinctive on customary rights ownership. Otoweri Village was formerly inhabited by Sebyar tribe, while Tomage Village was Irarutu tribe.

Tangguh LNG also supports governance strengthening in partnership with PSKK-UGM and Fakfak government both in these two villages. Governance strengthening in the district especially in Otoweri and Tomage include includes the development of Civil Administration Information System (SIAK), civil registration, strategic planning, governance administration, budget planning districts/villages and *tupoksi* (function and its responsibilities) of village and district officials and *Baperkam* (Village Representative Institutions) members.



Figure II-214 Tomage Village in Bomberay District

Total of Population

Bomberay District is one district in Fakfak Regency which has eleven villages include Otoweri, Tomage, Mbima Jaya, Warisa Mulia, Onim Sari, Mekar Sari, Pinang Agung, Bumi Muroh Indah, Wonodadi Mulya, Wamosan, and Tesha (Centraul Bureau of Statistics of Bomberay in Figures 2011). In the AMDAL

Tangguh LNG Expansion Project, surveyed village consist of Otoweri and Tomage.

Prior in 2004, Tomage and Otoweri were united in one village before the introduction of special autonomy. Otoweri Village is supposedly known as gateway to the village of Tomage. Due to the availability of facilities and complete food stocks, many residents prefer to live in Otoweri than Tomage. Thus, total of population in Otoweri is more than Tomage. However, none of data conveys whether there has been a movement of communities from Tomage to Otoweri.

Table II-158 Total Population of Otoweri and Tomage Community in Bomberay District in 2011

| No. | Village | Population (Inhabitant) | | | Sex Ratio |
|-----|---------|-------------------------|--------|-------|-----------|
| | | Male | Female | Total | |
| 1 | Otoweri | 172 | 156 | 328 | 110.2 |
| 2 | Tomage | 106 | 106 | 212 | 100 |

Source: Survey and Census by UGM, 2011

Table II-159 Total Population of Otoweri and Tomage Community in Bomberay District in 2002, 2009, 2011

| No. | Village | Population (Inhabitant) | | |
|-----|---------|-------------------------|-------------------|-------------------|
| | | 2002 ¹ | 2009 ² | 2011 ³ |
| 1 | Otoweri | - | 244 | 328 |
| 2 | Tomage | - | 182 | 212 |

Source : 1 AMDAL Tangguh LNG 2002; Social Economic Survey in DAVs by UGM 2009; 3 Census and Survey by PSKK UGM, 2011

Population Structure

a. Age

Both age groups in Tomage and Otoweri have similar number of highest average of young age group. The age range is between 0-29 years. Dynamic structure of population in each age group indicates a heavy burden borne by labor force at the present time and in the next few years.

Table II-160 Total Population by Age in Bomberay District in 2011

| No. | Village | Age Group | | | | | | | | Total |
|-----|---------|-----------|-------|-------|-------|-------|-------|-------|------|-------|
| | | 0-9 | 10-19 | 20-29 | 30-39 | 40-49 | 50-59 | 60-64 | > 65 | |
| 1 | Otoweri | 94 | 75 | 67 | 42 | 38 | 8 | 1 | 3 | 328 |
| 2 | Tomage | 71 | 40 | 42 | 32 | 17 | 4 | 3 | 3 | 212 |

Source: Survey and Census by UGM, 2011

b. Religion

Religion is widely adopted in both villages namely Islam, Catholic and Christian. For Otoweri Village, villagers are dominated by Muslim, while Tomage village is predominantly Catholic.

Table II-161 Total Population by Religion in Bomberay District in 2011

| No. | Village | Religion | | | | | Total |
|-----|---------|----------|----------|-----------|-------|--------|-------|
| | | Islam | Catholic | Christian | Hindu | Buddha | |
| 1 | Otoweri | 209 | 1 | 0 | 0 | 0 | 300 |
| 2 | Tomage | 14 | 179 | 12 | 0 | 0 | 205 |

Source: Survey and Census by UGM, 2011

- **Pattern of Livelihood and Income Level**

Labor and Livelihood

Livelihood pattern of Tomage and Otoweri population presents fishermen by 28% and agriculture by 21%, while others work as employees of oil companies. In both these villages recorded unemployment at 8%, which is recognized as open unemployment while disguised unemployment to be higher than that. With the dependency ratio reaches 81, it can be said that every 100 people of productive age in these two villages have to bear 81 unproductive people (babies, elderly, etc.).

Table II-162 Dependency Ratio

| Livelihood | Onar Lama | Onar Baru | Total | % |
|--|------------|------------|------------|-------------|
| Fishery | 52 | 8 | 60 | 28% |
| Agriculture | 10 | 35 | 45 | 21% |
| Trading and UKM | 13 | 8 | 21 | 10% |
| Employee | 21 | 15 | 36 | 17% |
| Teacher/PNS (civil servant)/TNI (military) /Polri (police)/Village Officials | 12 | 13 | 25 | 12% |
| Labor/Service | 3 | 5 | 8 | 4% |
| Workforce | 111 | 84 | 195 | 92% |
| Unemployment | 12 | 5 | 17 | 8% |
| Labor Force | 123 | 89 | 212 | 42% |
| Non-Labor Force: housewife, student, infant & elderly | 177 | 116 | 293 | 58% |
| Total | 300 | 205 | 505 | 100% |

Source: Survey and Census by UGM, 2011

Economic Activities

The geographic location of Otoweri Village is on the south shore of Bintuni Bay, while Tomage Village is located at the entrance of Tomage River. Otoweri location benefits economically due to easy access to the economic activities in Bintuni Bay.

There is Saving Loan Cooperative (KSP) of Mawerehawamo in Otoweri as well as in Tomage, Saving Loan Joint Units (UBSP) of Omniovo provide access to capital for community. The economic activities consist of salted fish production, industrial crops, livestock breeding, carpentry services, and vegetables farming, while the main activity is fishing shrimp. There is only one shrimp collector in Otoweri.

The median income in both villages is shown in the table below:

Table II-163 Average Income

| Village | Income per Capita/ month (Rp) | Household Income/ month (Rp) |
|---------|-------------------------------|------------------------------|
| Otoweri | 849,781 | 4,332,845 |
| Tomage | 546,559 | 2,863,322 |

Source: Survey and Census by UGM, 2011

Community Development

Since 2004, Tangguh LNG has run a community development program (COMDEV) in Otoweri Village, and in recent years its development program has also been implemented in Tomage Village.

Through Participatory Planning (PBM), community development committee and community members put a development program for village together, according to needs and priorities. The program emphasizes on: 1) Infrastructure Development Program; 2) Educational Aid; 3) Health; 4) Women Empowerment; 5) Youth Program; 6) Economic Empowerment Program; 7) Religious and; 8) ATK and incentive organizers.

Through COMDEV activities, community is able to participate on development planning in accordance with the needs and priorities existed in the village. Furthermore, community is also able to implement and evaluate each of COMDEV program conducted in the village independently.



Figure II-215 Community Planning in Otoweri Village, Bomberay District

- **Local Business Growth**

Number of economic facilities in Tomage includes five units of kiosk / stall. Type of businesses owned by villagers covers crops, agriculture and fisheries. Commodities of these businesses consist of vegetables, fruits, crabs, and shrimp. In addition, there are also oil, cakes, mobile phones, and furniture sellers.

Table II-164 Type of Business in Bomberay District in 2011

| Type of Business | Tomage | |
|------------------|----------------------|-------------------------|
| | Comodity Product (%) | Consumption Product (%) |
| Farming | 100 | 0 |
| Fishermen | 0 | 100 |
| Fishery | 0 | 100 |
| Agriculture | 100 | 0 |

Source : Food Security Survey by IPB, 2010

- **Natural Resources Utilization**

Agropolitan zone with agricultural and livestock commodities are encouraged to be a method of natural resource utilization in Bomberay District. Agricultural commodities focus on paddies and rice crops, while livestock sector is cattle farms. Agropolitan zone in Bomberay District is divided into four clusters. Based on the Spatial Profile of Fakfak in 2012, the four clusters are located in three annual crops and one crop area located between the wetland and dry land crop areas.

Bomberay Agropolitan zone plans to be located in an area of 200,000 acres. This area is expected to develop into a central collection and distribution of agricultural commodities for local and regional services. Until now, investment opportunities of agropolitan development have been attracted investors from China for the development of food crops of rice and corn.

Study by IPB fishery in 2013 recorded type of fishery catches in Bomberay District includes mullet and shrimp. Fishing gear commonly used by community is nets. This fishery product is marketed in Fakfak.

- **Transportation Facilities and Infrastructure**

- a. Otoweri

People should use water transportation such as a longboat, speedboat, or *ketinting* (longtail boat). There is no regular cruise towards the village so had to rent a fishing boat or a ship supplier logistics between villages, or can also have a ride from Tangguh LNG boat that have a particular itinerary. Otoweri can be said as the village gate of Tomage. The migrants frequently make a stop first at jetty of Otoweri and buy supplies in the stalls. This is due to stock groceries at Tomage stalls sometimes empty. Even villagers of Tomage buy at stalls in Otoweri because it is cheaper. The journey to Tomage of this village can be reached by motorboat less than two hours. Administratively, this village consists of two Neighborhoods (RT), RT 1 is located in the jetty area and RT 2 is located next to a mosque.

- b. Tomage

Roads condition in Tomage is hard damage, although street has been paved. To support water transport, there is a jetty provided in the village. Other public facilities have been built by local government such as education, health, religion, sports, and economics. Educational facilities include an elementary school building, and official houses for five teachers. For villagers plan to continue education to a higher level, they must go to the capital of district.

Health facilities include Supporting Community Health Center (Pustu) and Village Malaria Workers (JMK). There is also health program of Tangguh LNG purposed to maternal and child health. Only a Catholic church as place of worship is available in the village. Sports facilities include a soccer field and volleyball court. To date, for village government facilities, Tomage does not have sufficient village office unless occupying official house of principal.

In this village, market is not yet available in this village. For economic means, there are four kiosks used for buying daily needs. These stalls are owned by migrants from *Buton*. At this time, the condition of kiosk has diminished because many residents are owed to the owner of the kiosk purchases. The stall owners have been trying to collect the debt, but many people cannot pay off

their debt due to lack of money. This village does not have a place of entertainment. For entertainment, they are watching television at neighbor houses that can afford to buy a satellite.

- **Education**

Based on studies conducted by PSKK-UGM in 2011, there are only two schools in Bomberay District. These two schools are elementary schools, namely SD Inpres Otoweri and SD YPPK Tomage. It also identified 76 children aged 7-12 years who were attending school in 2011, while 89 remaining were not declared as a student.

The average education period of Bomberay District communities tends to be short ranging between 5.2 years.

Table II-165 Total of School in Bomberay District in 2011

| No. | School | Total of Children aged 7 - 12 years Attend School | Total of Children aged 7 - 12 years not Attend School | Average of School Year |
|-----|---------------------------------------|---|---|------------------------|
| 1 | SD Inpres Otoweri; and SD YPPK Tomage | 76 | 89 | 5.2 tahun |

Source: Bomberay District in Figure, 2012

b Kokas District

- **Description and General Overview**

Kokas is located in the northern part of Fakfak District with an area of 1,786 km². The district boundaries comprises of the Berau Bay in the north; while Southern, Western and Eastern part have land borders with Kramongmongga, Patipi Bay, and Bomberay Districts.

The area of Kokas District is divided into 22 villages, mostly in coastal areas. The surveyed villages in the AMDAL studies consist of Goras Village, Darembang Village, Furir Village, Fior Village, Andamata Village, Kokas Sub-district, Kinam Village, Sekar Village, Sisir Village, Kampung Baru, Ugar Village, Taver Village, and Arguni Village.



Figure II-216 Arguni Village in Kokas District

Total of Population

Kokas District is one of district in Fakfak. The district has 22 villages consisted of 14 villages in coastal areas and eight villages in inland areas with hills and mountainous topography. However, only 13 villages included on AMDAL studies, namely Goras Village, Darembang Village, Furir Village, Fior Village, Andamata Village, Kokas Village, Kinam Village, Sekar Village, Sisir Village, Kampung Baru, Ugar Village, Taver Village, and Arguni Village (Kokas District Data, 2012). Kokas Village, Sisir Village, and Sekar Village respectively have the largest population, i.e. 409 inhabitants, 509 inhabitants, and 622 inhabitants.



Figure II-217 Sisir Village and Kokas Township in Kokas District

Table II-166 Total Population in Kokas District in 2012

| No. | Village | Population (Inhabitant) | | | Sex Ratio |
|-----|----------------------|-------------------------|--------|-------|-----------|
| | | Male | Female | Total | |
| 1 | Kokas Sub-District | 263 | 254 | 517 | 117.5 |
| 2 | Kampung Baru | 183 | 180 | 363 | 101.6 |
| 3 | Sisir Village | 248 | 261 | 509 | 95 |
| 4 | Sekar Village | 293 | 329 | 622 | 89 |
| 5 | Ugar Village | 115 | 109 | 224 | 105.5 |
| 6 | Batufiafas Village | 85 | 92 | 177 | 92.3 |
| 7 | Patimburak Village | 77 | 65 | 142 | 118.4 |
| 8 | Mandoni Village | 143 | 152 | 295 | 94 |
| 9 | Mambunibuni Village | 187 | 150 | 337 | 124.6 |
| 10 | Kriawaswas Village | 43 | 42 | 85 | 102.3 |
| 11 | Kinam Village | 90 | 75 | 165 | 120 |
| 12 | Andamata Village | 78 | 78 | 156 | 100 |
| 13 | Arguni Village | 92 | 83 | 175 | 110.8 |
| 14 | Village Taver | 105 | 88 | 193 | 119.3 |
| 15 | Fior Village | 135 | 119 | 254 | 113.4 |
| 16 | Furir Village | 40 | 39 | 79 | 102.5 |
| 17 | Darembang Village | 89 | 91 | 180 | 97.8 |
| 18 | Goras Village | 216 | 192 | 408 | 112.5 |
| 19 | Mitimber Village | 50 | 53 | 103 | 94.3 |
| 20 | Waremu Village | 52 | 65 | 117 | 80 |
| 21 | Woos Village | 17 | 20 | 37 | 85 |
| 22 | Bahamdandara Village | 34 | 25 | 59 | 136 |

Source : Population Data of Kokas District, 2012

Structure of Population

a. Age

The age group of Kokas District population cannot be explained completely; hence, based on the observation, the largest population is on the range of young age between 0-29 years. Dynamic social structure in each age group indicates a heavy burden borne by labor force at the present time and in the next few years.

b. Religion

Most of the population adheres to Islam. Particularly in coastal areas such as Arguni, Taver, Goras, Darembang, Fior, Forir, Andamata, Sisir, and Sekar Villages, all inhabitants (100%) are Moslems. Other religions adhered by Kokas residents is Christian. There is only small portion of Christian religion in the inland villages (a little far from the shore) such as Kinam and Patimburak.



Figure II-218 Mosque in Arguni Village, Kokas District

- **Pattern of Livelihood and Income Level**

Labor and Livelihood

Most communities have a livelihood as fishermen, especially in coastal villages such as villages of Arguni, Taver, Goras, Darembang, Fior, Forir, and Andamata. However, people living near the Kokas District such as Sisir, Sekar and Kokas Village, the bulk of livelihood is as teachers/civil/military/police/village officials.

Table II-167 Workforce and Livelihood

| Livelihood | Kokas Sub-District | Kampung Baru |
|---|--------------------|--------------|
| Fishery | 12 | 5 |
| Agriculture | 24 | 302 |
| Trading and UKM | 5 | 9 |
| Tangguh LNG Employees | 0 | 0 |
| Teacher/OPNS (civil servant)/TNI (military)/Polri (police) /Village Officilas | 47 | 34 |
| Private Employees | 11 | 5 |
| Labor/Service | 0 | 7 |
| Livestock | 5 | 0 |
| Total | 104 | 362 |

Source : Kokas District in Figure, 2012

Economic Activities

Kokas District has a variety of economic activities, such as nutmeg plantations, palm and food crops such as taro and cassava (*kasbi*). In this district also found many activities in the fisheries sector, particularly in Arguni Island which become fish stocking point to supply catering contractor of Tangguh LNG. On this island can also be found in seaweed and pearl farming commercially.



Figure II-219 Market in Sekar Village, Kokas District

Stocking activity from Arguni fish supply to catering needs of Tangguh LNG is managed by Emenem Jaya Cooperative. Up to now, a total of fish supply reaches 72.19 tons of the type of red snapper, mackerel, and mubara, of which 17.85 tons are supplied in the year of 2013.

- **Local Growth Business**

Economic facilities in Kokas District are not much different from other facilities in the districts through kiosks/stalls and markets. At the village level, the availability of kiosks/stalls is very essential to the community buying their daily necessities such as sugar, coffee, tea, cigarettes or gasoline. At least, one stall is available in every village.



Figure II-220 Emenem Cooperative in Arguni Village, Kokas District

Market in Kokas District is centered on Kokas Sub-district and also in Sekar Village. The market in Kokas Sub-district is physically less appropriate place called as market. Compared with Sekar Village which has a constant place for buying and selling process, market activity in Kokas Sub-district occur at the port of Kokas. Commodities sold in these markets are slightly different. Market in Sekar completely sells commodities varying from seafood, farming and household appliances. Meanwhile, sales commodities in Port of Fakfak are limited to crops and agriculture, such as durian and so forth.

Related to livelihood, there are two distinctive aspects found in Kampung Baru, namely Ownership Pattern, associated with the origin clan; and Utilization Pattern, open to migrants. In terms of natural resource utilization, company should deal firstly with the owner of the clan without involving Petuanan (Mr. King) as a facilitator.

- **Natural Resources Utilization**

Villages in Kokas District occupies the coastal region. Based on the geographical site, fisheries resources become the main livelihood for villagers living in the shore. Besides fisheries, people also cultivate seaweed and pearl oysters as their income source.

Government of Fakfak Regency plans to develop Kokas District as nutmeg industry. Kokas nutmeg plantation in the district will set up an area of 140 acres involving 105 families. In addition, another commodity product from this district is chocolate that is centered at Ugar Village.

- **Transportation Facilities and Infrastructure**

Permanent market in Sekar Village provides useful facilities which are not only for the villagers but also the surrounding villages in Kokas District such as Sisir Village and Kokas Sub-district. Infrastructure of Kokas District has been development through public facilities, namle Elementary School building (SD), a place of worship and Puskesmas (Community Health Center)/Pustu (Supporting Community Health Center) which are available almost in every village.

Meanwhile, other economic infrastructure includes electricity only available in Kokas Sub-district, Sekar Village, and Sisir Village. The electricity serves from 6 - 12 o'clock at night. None of electricitiy is provided to other villages, therefore villagers do not frequently use oil/diesel generators due to expensive fuel costs.



Figure II-221 Port of Kokas in Sekar Village, Kokas District

Telecommunications network is only available on *wartel* (telecommunication stall) from telecommunication satellites served only at nine in the morning until two in the afternoon, then at seven until nine at night. The telecommunications network from cellular phone providers and PT Telkom Indonesia is not available in Kokas unless going to *wartel* or away from Kokas in order to get a signal.

Meanwhile, means of transportation available to residents of Kokas District varies for each village. Transportation access to the coastal villages, such as villages of Arguni, Taver, Goras, Darembang, Forir, Fior, Andamata, and Ugar is still quite difficult. To reach these villages, people have to use sea route by using a long-tail boat or longboat for approximately 30-45 minutes from Sisir Village/Sekar Village or Kokas Sub-district. The transportation facilities available in Sekar, Sisir, Kokas Sub-district and Kampung Baru are sufficient due to the availability of public transportation served Kokas - Fakfak transport within an hour. Based on the Central Bureau of Statistics of Kokas District in 2010, the length of roads in the district is along 143.68 km, consisting of 98,681 km of provincial roads and 45 km of district roads. Motor vehicles such as cars and motorcycles are able passing through this road. Despite of having *ketinting* (long-tail boat) and longboat, the majority of population also has motorcycles and car as a means of land transportation to facilitate their journey.

- **Education**

Based on the Central Bureau of Statistics studies in 2012 (Kokas District in the Figure), there are 20 existing schools to accommodate education needs of Kokas community as follows:



Figure II-222 SD YPK Kokas (Elementary School of YPK Kokas)

Table II-168 Total of School in Kokas District in 2011

| No. | School | School Name |
|-----|---------|---|
| 1 | SD (11) | SDN Fior SDS YPK Kokas SDN Inpres Kokas SDN Inpres Kampung Baru SDN Arguni SDN Forir SDN Inpres Andamata SDN Inpres Darembang SDN Inpres Ugar SDN Inpres Kinam SDN Inpres Goras |
| 2 | SMP (2) | SMPN 3 Kokas SMPN 1 Kokas |
| 3 | SMA (1) | SMAN Kokas |

Source : Bomberay District in Figure, 2012

2.3.1.3 Migration

Tangguh LNG presence in the Bintuni Bay has given contribution to the socio-economic changes in Bintuni Bay and Berau Bay regions, and especially for villages in Surrounding Area of Tangguh LNG Operations site. Development of this region is accelerated by the establishment of Teluk Bintuni Regency in 2005. Economic

benefits that arise from Tangguh LNG presence and the establishment of new regency, triggering migrants to come and settle in this region, as the honey pot syndrome.

A census and survey data carried out by PSKK-UGM in DAVs in 2003 and 2005 to 2011 indicates a trend showing increasing number of migrants in this region.

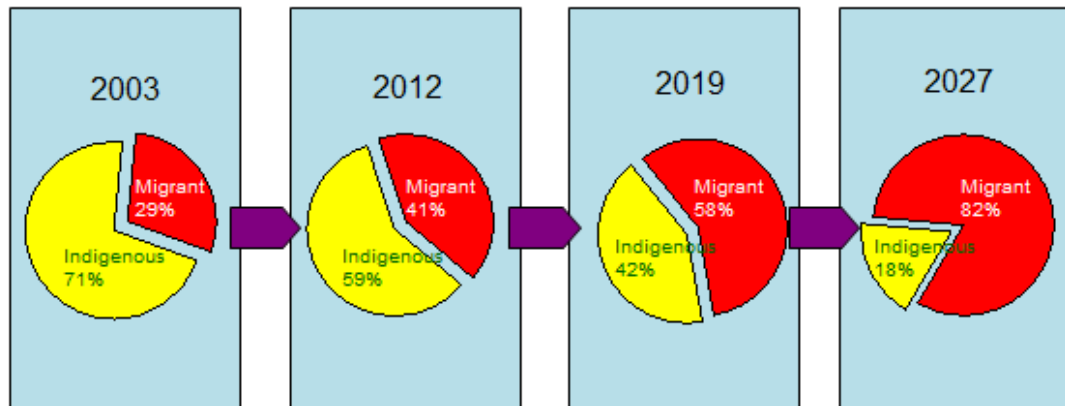


Figure II-223 Projection of Indigenous People and Migrants since 2003 to 2027

The chart above also demonstrate the projection of Indigeous People and migrants until 2027, of which the percentage of Indigenous People in that year is projected at 18%. The conditions assumed in the normal operating state of Tangguh LNG as it is today.

In the evaluation of governance program conducted by Elacuria in 2011 related to in-migration, mentioned some destination areas in Bintuni Bay, i.e. Babo, Tofoi, Tanah Merah, Saengga, and Onar located in the south shore of Bintuni Bay. However, other census and survey data in 2011 conducted by PSKK-UGM, showed another entrance passed by villages on the north shore of Bintuni Bay.



Figure II-224 Migration coming to Babo

To support governance program regarding in-migration management, Tangguh LNG in cooperation with PSKK-UGM support Civil Administration Information System (SIAK). The program is part of governance strengthening, particularly incoming migration program. Other activities in governance strengthening delivered to village officials is related on civil registration, strategic planning, governance administration, budget planning districts/villages and *tupoksi* (function and its responsibilities) of village and district officials and *Baperkam* (Village Representative Institutions) members, as well as training in order to prepare the Development Planning Meeting Organizing Team (TPM). Based on demographic data between the years of 2003-2015 is predicted to have an additional amount of population approximately 8,000 residents, by the time of early construction of the Tangguh LNG Expansion Project. Trend of projected migrants can be seen in the following figure:

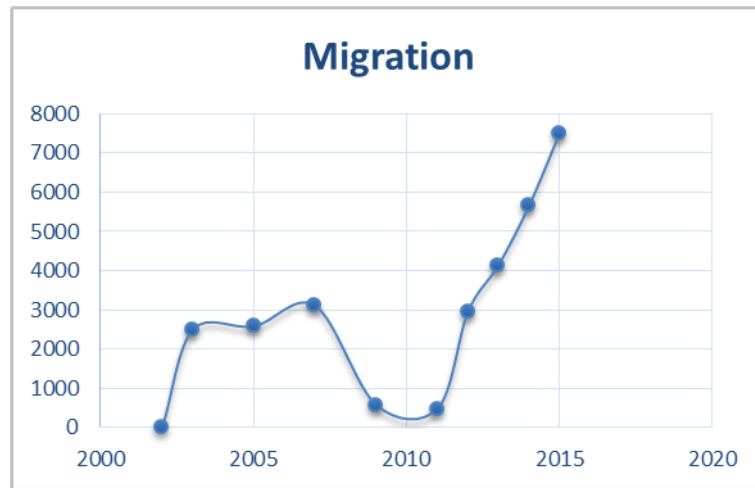


Figure II-225 Projected Migration from year 2000 to 2015

In the prior time, Bintuni population or about 70-80% population have a typical livelihood system such as hunting, gathering and relied heavily on forest products. Hence, such livelihood pattern is slowly neglected (Sutrisno (ed.), 2009: 431). In 2003, the number of migrants in Bintuni Bay was approximately 15.56%, and projected to increase from year to year. Within certain limits, the existence of Indigenous People in certain ethnic groups of Sebyar, Sumuri, Irarutu, and Mbaham in Kokas District began to be marginalized from mainstream. The migrants in Bintuni Bay live widespread in the capital of regency and district, while Indigenous People settle separately in the coastal areas of the river as traditional fishermen. Other Indigenous People live in the lowlands and hills as sago gatherers.

In this study, we discuss some ethnic groups among others Sebyar, Sumuri, Irarutu, and Mbaham in Kokas District as part of ethnic groups living in the surrounding of Bintuni Bay, an area located in the western part of Papua, precisely at the mouth of the bird's head upon 132036' - 134036' East and 03015 ' - 03032' South. The total area of Bintuni Bay covers 22,817.44 km² or 60.7% of the total area of Manokwari Regency.

2.3.2 Socio-Cultural

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2.3.2.1 Ethnic Groups in Tangguh LNG Operation Site

a. Sebyar

Sebyar ethnic group is one of the indigenous ethnic groups settled in Bintuni Bay. This ethnic group has historical relationship and close kinship with ethnic groups in Fakfak recognized by the similarity of families name and origin stories. In the past, Sebyar is included in the territory of Petuanan Arguni Kingdom.

This ethnic group classifies itself into two sub-ethnics namely: Dambando (Ndamban) sub-ethnic, and Kembaran sub-ethnic. These groupings are based on the place of living and spoken dialect. According to the place of living, Dambando sub-ethnic resides in the woods of South Weriagar, while Kembaran sub-ethnic dwells on the coastal. Regarding the language aspect, these sub-ethnic groups have two different languages, namely Dambando language and Kembaran language (Keith and Christine Berry, 1987).

The following are the distribution of Dambando and Kembarano sub-ethnics :

1. The *Dambando* (Ndamban) Sub-ethnic inhabits Tomu Village, Aranday Village, Kecap Village, and Kampung Baru Village. Clans included in *Dambando* sub-ethnic consist of awarisa, Kosepa, Kaitam, Inai, Gegetu, Efun, Kokop and Kinder. The first three aforementioned clans (Nawarisa, Kosepa and Kaitam) are also part of indigenous clans of Tomu region according to the informant. While the five clans mentioned later are part of migrant's clans derive from Weriagar clans. Meanwhile, Ndambando sub-ethnic groups inhabit remote area along Weriagar River.
2. *Kembaran* is a sub-ethnic clan inhabited in coastal areas of Weriagar, Taroy, and Kamundan. In addition, these sub-ethnics are found in the villages mentioned above which is in the north of Bintuni Bay, also some of these live in Otoweri Village, southern part of Bintuni Bay. The division of sub-ethnic *Kembaran* into two groups is caused by disputes occurred between sub-ethnic members when they are in the village. As a result of the dispute, some of them moved and settled in the southern bay. This happens before the Dutch government did pacification in this area in the early of 20th century (based on the description from FGD results in Weriagar, May 2, 2013). According to its origin, some clans formerly formed this sub-ethnic such as Bauw, Patiran, Kutanggas, and others which have a very close kinship with the clans in Fakfak. In addition, there are

also clans came from other places, such as Sorowat who admits that his ancestors came from Salawati (Sorong) and Frabun clans derived from Key Islands, Southeast Maluku. There are 26 clans found in Sebyar ethnic divided into two groups based on ethnic origin. Ndambando sub-ethnic spread in Tomu of which some clans inhabiting the village such as Nawarisa, Kosepa, Kaitam, Inai, Gegetu, Ufun, and Kinder.

These two groups have lived in the same place and engaged close relationship to each other although they have different languages. The place of living and close relationship have produced a blended language between these two groups due to a dialect relation between Dambando and Kembaran languages (*Action-research on Cultural Revitalization of Sebyar and Sumuri in Bintuni*, by FISIP Airlangga University, 2010).

Relationship to the universe are commonly found in various indigenous tribes also Sebyar community. They strongly believe that if human destroy the nature, it will back attack human dwell in it. The thought is relied on totemic consciousness which are familiarly found in many folk legends. This consciousness believes human are originated from Mother Nature. For example, Kutanggas clan believes that they are descendants of the crocodile (*Crocodylus Porosus*), while Bauw clan believes cassowary (*Casuarius Benetti*) as their ancestor.

Close relationship with nature is also manifested in living habit of Sebyar community. When people suffer from illness, it will be associated with faults (violations) to the nature or other person. This is not only suffered by adult but also small children and infants's illness whom parents violations are charged to them. For example, many diarrhea diseases suffered by children and infant tend to be perceived as parents faults or supernatural realm rather than unhygienic environment. Consequently, children or sick person suggest getting medical treatment from a shaman than Pustu (Supporting Community Health Center). In many instances, the sick children will be given water with special prayers and herbs of medicinal plants from the woods. Disease treatment often gives fatal results even death for patients.

Sebyar belief does not only believe on close relationship with the nature, but they also embrace religious beliefs such as Islam and Catholic. The two major religions are called religious family where Islam first entered the region in the early 1900 named as older sister, while Catholic entered around 1938 named as young sister. Islam spread from Kamundan to the Sebyar villages in the the northern part of Taroy. In Weriagar, Islam co-exists in a harmonious relationship with the Catholic. The proportion of population is 70% Catholic and 30% Moslem.

Religious harmony among Sebyar community complies with customary law that has become a fundamental foundation to build a harmonious life in the

village. For them, religion is a freedom of belief in God, also part of rights of each individual. Religious harmony is expressed by various religious celebrations like Eid and Christmas. The religious celebrations often held together between the two major religions.

However, syncretism is still commonly found among both Islam and Catholic. The embodiment of Syncretism among Islam is through a ritual of mosque dome construction as well as ritual of the four main pillars construction in the mosque called *Hanan, Manan, Dayan, and Burhan*. Donation support to the place of worship construction both Islam and Catholic is another form of Syncretism practices. Furthermore, the practices also occur when people give offerings before all project activities in indigenous territories of Sebyar started. This practice is expressed as a symbol of respect the prevailing belief in the community.

The smallest social organization in Sebyar community is an extended family. Family relationship is built through bond of marriage based on religious affiliation. Main requirement of marriage is dowry with varied amount up to millions dollars. If the groom cannot pay off the approved cost of dowry before marriage, then she is not entitled to bring his wife to stay at her parents place. Marriage is called as 'in-marriage' or *kawin masuk* in which the couple is required to stay at women parent's home after marriage until her husband's pay the dowry off. In contrary, if the groom was able to repay the approved cost of dowry, then the couple will live with husband's parents. Sebyar community adopts patrilineal lineage, which follows the line of male lineage. Thus, when a man from Bauw clan married to women of Frabun clan, it will follow the lineage of his paternal of Bauw clan. However, many couple encountered in in-marriage patterns that the children will follow the lineage of her/his mother in which patrilineal offspring converted into matrilineal offspring.

Community of Sebyar Kembarano largely consists of Bauw members clan. This clan group is almost ubiquitous around Bintuni Bay and Berau Bay reach to Fakfak. According to the interviewee, this group could have a quite large number of clan members due to the marriage of male offspring.

The structure of clan groups of Sebyar community are independent group because the power is centered at the level of clan. Each clan regulates the ownership of natural resources at the same time to maintain the existence of the clan members. Each clan has a head of clan. Each head of clan speaks on behalf of clan members in each discussion of Sebyar community activities, such as marital problems, death and utilization of indigenous lands. Besides being a clan representative in discussions between the clans head of clan also considered as a unification within the clan members. The oldest members of community or who have the oldest lineage is chosen as the head of clan.

Sebyar people actually are not familiar with the leadership of head of clan and traditional leadership structure. They tend to prevail the leadership of head of clan. Most of Sebyar-Kembarano sub-ethnic people settle in the coastal areas closely to the river flow. Their housing pattern stretches along the coast and built to follow the river's edge. Unlike the Sebyar-Ndambano sub-ethnic, they are alive and living in a swamp surrounding the Sebyar River.

Sebyar people's house is divided into two parts of building, namely the first part consists of a living room and one bedroom, while the second part is the kitchen. The bathroom and toilet are usually just a basic construction, just covered by former plywood without roof. Most people have no bathroom and healthy toilet.

Their houses are built on the higher pillars construction than tides. The houses were simply on stilt. Generally, the house floor is made of wood, while the walls are made of *merbau* or *matoa* woodplanks or other additional material such as dried sago leaves. Main building roof is commonly made of zinc. While kitchen building has a roof made of sago leaf, and frequently connecting to the main building. By doing so, on the day, the kitchen is to be a cooler place to gathering.

Housing patterns of Sebyar community built under their parent's instruction. Their house was built according to their interest and not constructed in accordance with the clan groups agreement. An adult male will in time be asked by his father to build a home. If the adult male has already capable on several aspects of skill, he will be assisted by his parents to build a house. Their houses are built on communal land.

Different conditions encountered in Tomu Village. Community is forbidden to build houses by their own. Most of land in Tomu and Ekam villages are controlled by Kosepa clan. Kosepa clan controls the land around the villages of Tomu, Ekam to Sebyar Rejosari. Therefore, for those who renovate their houses should pay adat compensation to Kosepa clan. This understanding comes from the assumption that Kosepa, Nawarisa and Kaitam are the first migrants in Tomu, while other clans such as Henna, Gegetu, Efun, and Kinder are migrants arrived in Tomu after the three clans above.

b. Simuri

Simuri ethnic group (also called Sumerine) live in the southern part of Bintuni Bay and located on the peninsula of north Bomberay along the Bapai River and Gondu River. In terms of region administration, Simuri community settles in Simuri District. Simuri community consists of 18 clans spread in five villages, namely Tofoi, Tanah Merah, Saengga, Onar Lama and Onar Baru in south shore of Bintuni.

Sumuri community does not come from similar descendants, for example, Sowai coming from Tanah Merah, Wayuri coming from east of Bintuni Bay, Simuna coming from west coast around Fakfak region. The three ancestral clans then migrate and inhabit Simuri mainland as well as create a shared history and united language, namely Simuri language. At present, social facts indicate that besides reinforcing Simuri cultural identity, children are studying Indonesian language as an official language in school education. It is actually part of integration and homogenization processes with the entire territory of Papua and even Indonesia.

Sebyar people have close relationship to nature proved by some existence of cultural sites such as 'Kali Nene Mai' (Nene Mai River), Iron Wood Tree and Nene Mae site in Saengga River Estuary. Sumuri communities believe that nature is a dwelling place of their ancestors, hence respect nature is the same as adab respect to the parents. Frequent communication with the world spirit is practiced especially on land opening event. Communication is practiced through offerings such as betel nut and cigarettes giving to ancestral spirits. It is also accompanied by singing and praying contained asking for safety in the implementation of future activities in the prospective land.

c. Irarutu

According to the administrative area, Irarutu community live in Babo District. They occupy villages such as Irarutu III, Warganusa I, Warganusa II, Tugarama, Wagura, Suga, Mabowar, Fafurwar, Maridi, Yakaema, Wermutan, Fredebe, Satura, Maguri, and Sara. Irarutu word, according to the local people, has a meaning that Irroru means 'language' and Tu means 'true' or 'Good'. So, Irarutu means 'good language' or 'true language'.

According to tradition of Irarutu tribe, leadership in the community is on the level of clan. Each clan has a leader called head of clan or *nabrede*. Similarly, in Irarutu III Village, there are five community leaders for each of the existing clan, namely Ajumaat Nauri for Nauari, Nasar Manuama for Manuama clan, Amusalam Fiawey for Fiawey clan, Umar Puara for Puara clan, and Fimbay Commission for Fimbay clan. Fimbay clan actually comes from ethnic groups of Wamesa, however, they are now recognized as one of the former clan in Babo due to their ancestors (Myor Fimbay) had ever developed Babo region.

d. Mbaham

In Fakfak Regency, there are two ethnic groups. Firstly, Mbar-mbar inhabits the distribution area of Petuanan Arguni, Sekar, Wertuar, Ugar, and Rumbati. They inhabit coastal areas ranging from Goras, Andamata, Arguni, heading westward to the border of Kaisapata (which is the territory of Rumbati Kingdom). Meanwhile, some ethnic groups speaking in Iha Language inhabits coastal areas, for example, in Kokas such as Homokokma Village, Ubadari

Village, Patimburak Village, Sisir Village, Kampung Baru, Kramongmongga Village, and Warpeper Village.

Secondly, Mbaham Tiri (mountain people) ethnic group who is speaking in Mbaham language inhabits eastward inland villages covering an area such as Mambuni-Buni village, Bahbadan Village, Komkuamor Village, Namor Village, Nimbuktep Village, and Pikpik Village.

In addition to these two ethnic groups, there are migrant groups who arrive when the Sultan of Ternate/Tidore ruled over Bintuni and Fakfak. This group includes the King, the followers and relatives those who exercise power of Sultan of Ternate/Tidore in Fakfak and Bintuni. This kingdom consists of (1) Arguni (2) Sekar/Pikpik (3) Rumbati (4) Pattipi (5) Wertuar located in Kokas District, while in Fakfak capital city, the kingdom consists of (6) Ati-ati and (7) Fatagar. The last kingdom existed in Kaimana Regency, namely (8) Namatota.

In Kokas District, there are three kingdom centers visited by researcher team which are Sekar, Wertuar, and Arguni. Formerly, Sekar Kingdom was previously centered on Pikpik Village but today centered on Sekar Village in Kokas District. Sekar Village is the place where the royals reside. It is comprised of five major clans or *Petua*. The five major clans are Rumagesan (the clan descendants of the king), Serbunit, Baraweri, Iriwanas and Iha.

Sekar region includes villages of Sekar, Ugar, Genam, Batufiafas, Mandoni, Triwaswas, Mambuni-Buni, Bahbadan, Komkuamor, Pikpik, Nimbuktet, and Namor.

Arguni Kingdom is centered on Arguni Island, one of several islands in the end of southern bay. Arguni Kingdom region covers area of Kinam (in Kokas District) reached up to Kara-Kara as part of Tame Kali area or the whole area of Weriarag (in Teluk Bintuni Regency). Clans in Arguni (especially on Arguni Island) consist of: Paus-Paus (the royal clan), Rumosan, Mumuan, Umbesapu, Karoror, Masapu, Turua, Baraweri, Patiran, and Bauw.

While the Wertuar Kingdom lives at the center of Kokas particularly in Sisir Village including Homokokma, Ubadari, Patimburak, Sisir, Kampung Baru, Kramongmongga, Warpeper. Clans in aforementioned areas are Heremba, Pattipi, Hindom, Patiran, Bauw, Iha, and Baraweri.

2.3.2.2 Distribution of Ethnic Groups and Migration

Since the kinship system of ethnic groups in Papua oriented on clan ties, intimate relationship in some clans and inter-clan of several ethnic groups in the Bay area also become a major factor in the pattern of distribution areas of ethnic groups in the Bay. They also adopt nomadic lifestyle since the past hundreds years ago. The history of clan distribution which refers to the availability of natural resources and housing also support the establishment of sub-ethnic region. Sub-ethnic region

(detailed description of clan topic can be found in this report, especially to figure out about the clan distribution of the two tribes).

The history of clans or ethnic groups movement or distribution in bay region has been entwined in a long term period. There are several major factors behind the resettlement as follows:

1. Availability of natural resources consumed for food;
2. Belief on the plague attacks merely stopped after the resettlement;
3. Clan dispute among tribe usually begins with 'women issue' (such as men disputes related to women issues), customs violations by a particular clan, committed murder by a member of another clan against clan members;
4. Wars between tribes or known as the Hongi War;
5. Changes in social, cultural, and economic occur in the bay region.

Passing through the long term of migration and resettlement processes in the span of hundreds years, several clans inhabit several villages in the bay area today. Based on the geographic location can be assumed that the 20 clans of Sumuri tribe largely occupied villages in the southern waters of the bay, whereas the 15 clans of the tribe occupied most of Sebyar Village in the north, and four clans settled in the south, precisely in Otoweri Village.

Based on the aforementioned areas of sub-ethnic category, the following describes the geographical area where the clans dwell.

Firstly, **Sebyar Kembaran Sub-Ethnic Region** are areas inhabited by eight of 15 clans of Sebyar. The eight clans are Bauw, Pattiran, Kutanggas, Hindum, Frabun, Braweri, Sorowat, and Gegetu. They inhabit in the coastal areas/river estuary area in the northern of Bintuni Bay waters.

Administratively, the sub-ethnic of Kembaran (Sebyar) includes the villages of Weriagar Induk, North Weriagar, South Weriagar, East Weriagar, and Mogotira residing in Weriagar District. This district area is located in the northern of Bintuni Bay waters bordering the southern of Bintuni Bay waters and Aranday District around. Weriagar District is a new district after division area which was officially established in 2009. Previously, Weriagar was just a village included in Aranday District territory.

Secondly, **Sub-Ethnic Regions of Sebyar-Damabando** is an area inhabited by seven of 15 clans of Sebyar. The seven clans consists of three major clans i.e. Nawarisa, Kosepa, Kaitam, and four other clans such as Kinder, Efun, Inai, and Gegetu. These clans inhabit the northern of Bintuni Bay waters.

Administratively, the Sebyar Kembaran sub-ethnic includes two districts, i.e. Tomu District and Aranday District. The villages of Sebyar Rejosari, Tomu, Ayot, Adur, Wanagir, Ekam, Totira, Tambanewa, Perapera, and Sorondauni are included in

Tomu District. Meanwhile, Taroy Village, Manunggal Jaya, and Aranday are part of villages in Aranday District.

Thirdly, **Sub-Ethnic Region of Sumuri** is a region where the twenty clans of Sumuri tribes dwell in that place. The twenty clans are Masipa, Siwana, Kamisopa, Dokasi, Sabandafa, Waripa, Agofa, Wayuri, Fossa, Inanosa, Monai, Morena, Mayera, Arimuni, Bayuni, Dorisora, Simuna, Sowai, Sodefa, and Ateta. The entire clan inhabits the coastal waters/river estuary and in the southern of Bintuni Bay waters. Villages included on Sumuri cultural region consist of villages within Sumuri District territory, namely villages of Tanah Merah Baru, Saengga, Tofoi or Kelapa Dua, Onar, and Tomage.

Fourthly, **Sub-Ethnic Region of Sebyar** in the south is a cultural region where the four clans of Sebyar tribe dwell in due to the history of resettlement. The resettlement took long period of time also process as they occupied one of the region in coastal waters/waterfront at the south of the Bintuni Bay. Administratively, the clans occupied Otoweri Village, Bomberay District and, Fakfak Regency.

Detailed description of Irarutu III communities includes those who living in Babo District can be found in this study, while for Mbaham ethnic communities illustrated in this document is part of communities spread throughout Kokas District.

2.3.2.3 Leadership System- Petuanan

Traditional leadership system known by tribes in Bintuni Bay region can be grouped into four types according to the large and small-scale of population led by community leader, and according to the historical dimension of leadership that took place in this region. The first leadership is the head of clan. As mentioned before that each ethnic in Bintuni Bay was formed by a number of clan.

The first leadership system is led by community leader who is responsible to lead each clan. This community leader has particular terms in each ethnic group, for example, the Irarutu ethnic named *nabrede*, Wamesa ethnic named *didiau* or Mbaham Mata ethnic called it as *Dupiat*.

The task of community leader of the clan is adjusting domestic problems of clans such serving marriage ceremonies, regulating the utilization of natural resources in the ground owned by government, resolving conflicts between citizens and representing the clan to resolve problems occurs to other clans. At the present time, clan community leaders also represents the clan to take care and decide the utilization of natural resources such as forests, soil, water, rivers and others with the interested external parties such as government or corporate.



Figure II-226 The House of Petuanan Arguni King

The aforementioned roles are played by the head of clan either on the past or present time; therefore, this position is essential to the clan group. Basically, the position of head of clan is determined by seniority both in age and genealogies. Although seniority is a major requirement and foremost, sometimes the position is given to the one having good knowledge both about clan origins and history as well as has courage to defend the clan interests. By considering these, he can be recognized as a clan leader by its members.

The next leadership system is the head of village. This leadership system will be applied when a number of clan join and reside in the same location. Clans merging into the same residence called as village, is caused by many factors, namely security, marriage and trading factors. In the period before the incoming influences from outside, individuals who appear as leaders villages are citizens who have the courage and skill to defend and unite the community residents. Such leaders are called *ni mineroa* (in Simuri language), *nabrede* (in Irarutu language) and *nadi* (in Mbaham language). Such requirements indicate that the leadership position is not inherited in the offspring, whereas the position of the leader or head of village can switch from one clan to another clan.

The third is the leadership system in the Sultan of Tidore which performs trading expeditions in most areas in the Bay in the 19th century. In areas of trading expedition placed a number of representative/agent to collect local products are sent to the central government in Tidore. In his report, A.L Vink (1932:58) stated that, in 1896, Sultan of Tidore named community leaders as *Mner* of soa Beraweri, became 'king lieutenant' in Sekar Village. Furthermore W. J. Cator (1939:112) reported that Wertuar King previously under Rumbati King, but later became viceroy by letter decision (Besluit) of Tidore, dated on March, 30th, 1930. Also King

of Arguni was formerly under the King of Rumbati that could escape from the power of King of Rumbati in 1914 (WJ Cator, 1939:113).

Each of these aforementioned kings master a particular area called Petuanan region which includes a number of villages. Depicted on a Social Boundary map (map I-10 I-212 pages), there are three areas covered in Petuanan therein, including Petuanan Wertuwar, Petuanan Arguni, and Petuanan Sekar-Pikpik. Each Petuanan have a fairly widespread power coverage, not only in Fakfak Regency, but also included Bintuni Bay and Berau Bay region.

In Vink’s report (1932) and Cator’s report (1939) recorded that the area of Petuanan Raja Sekar covering 11 villages which all located in the area of Kokas hinterland inhabited by ethnic groups of Mbaham. Petuanan Sekar-Pikpik is one of Petuanan located in administration area of Fakfak government. The location of this petuanan resides in two districts namely, Kramongmongga and Kokas District and adjacent to Petuanan Wertuwar and Arguni.

After the death of the late of Rumagesan Amir (the 4th King of Pikpik-Sekar) to present, there is no change of the king position. To fill the leadership void, petuanan government temporarily held by Warnemen Sekar and Piter Tigtwigweria as customary leaders. Petuanan Sekar-Pikpik territory covers most of the coastal and inland villages in the Kokas District, such as Kokoda and some villages in the coastal region of South Sorong.

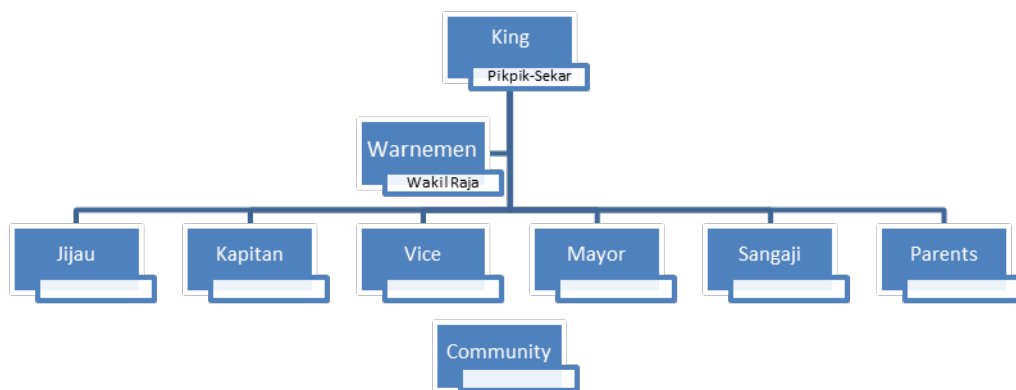


Figure II-227 Organization System of Petuanan Sekar-Pikpik

Furthermore, the area of King of Wertuar includes seven villages; entirely located on the western inland regions in Kokas that majority of the people are Mbaham ethnic. Territory coverage of Petuanan Wertuwar is Kramongmongga District, half of villages in Kokas District, Patimbuan, and most of the villages in South Sorong.

Then Petuanan Arguni region which consists of 13 villages of Petuanan located in coastal areas ranging from Kokas to Otoweri and Tomage. The entire population

came from Mbaham ethnic. In addition, the territory of King of Arguni also includes up to Teluk Bintuni Regency, as Babo District and Kalitami District.

Petuanan Arguni Region

Table II-169 Petuanan Arguni Area

| King | Village | Leadership Title |
|--------|--------------|----------------------|
| Arguni | 1. Arguni | Lieutenant |
| | 2. Andamata | Lieutenant |
| | 3. Fior | Vice Head of Village |
| | 4. Furir | Vice Head of Village |
| | 5. Darembang | Vice Head of Village |
| | 6. Goras | Vice Head of Village |
| | 7. Bomberay | Vice Head of Village |
| | 8. Otoweri | Vice Head of Village |
| | 9. Tomage | Vice Head of Village |

Source: Primary Data, 2013

According to adat, King of Petuanan has the authority to govern and also as the owner of customary rights over the resources in its petuanan area which is recognized by the Indigenous People. King admits clans in his region have customary rights over the existing resources in the region of petuanan. In addition, the king also has a role in the resolution of customary rights disputes as follows:

- a. If there is a dispute at the village level, the highest adat leader in village level will handle the problem in accordance with the authority and position, and if the dispute can not be resolved at the village level, the dispute will be delivered to the level of the King through adat leaders in the village to be resolved.
- b. If a dispute occurs between petuanan, it will be resolved at the level of King with adat leaders appointed by the King.
- c. If a dispute occurs at the community level (as in the current formal government dynamics), local/indigenous/Petuanan requested by government/security forces to resolve the dispute together.

Indigenous People living in areas of Petuanan have one sacred belief that their ancestors were brothers. Then, the blood ties are getting stronger due to marriage cross between Petuanan, both among the royal family and other Indigenous People. Therefore, Indigenous People are only separated by a boundary of Petuanan and royal government areas, while it is still in the unity of generous family.

2.3.2.4 Social Culture Heritage

Each culture has each devices in terms of material and non-material. The cultural material device is a 'hardware' of culture that manifests itself into physical forms and materials borrowed from Koentjaraningrat term: a physical system (and/or artifacts) culture. It is a set of cultural objects that become cultural distinctiveness inherited generation to generation.

Cultural objects are owned by the tribe either belong to ethnic distinctiveness based on local wisdom and local knowledge, as well as on the influence of external culture as a result of interaction with other culture. Part of this section does not want to create a complex of origin category of cultural objects, but rather outlines the cultural objects that become distinctiveness of cultural wealth of these tribes.

Table II-170 Cultural Objects of Simuri and Sebyar Tribes

| Simuri Tribe | Sebyar Tribe |
|--|--|
| | Kembaran and Dambando |
| Arts means (Music Instrument): 1. <i>Tifa panjang</i> (traditional drum) 2. <i>Gong</i> | Arts (Music Instrument): 1. <i>Tifa pendek</i> (traditional drum) 2. <i>Gong</i> 3. <i>Terummbe</i> |
| Traditional Clothes: 1. Crown made of cassowary feathers or other birds 2. Gold Jewelry 3. <i>Sisir bambu</i> (comb made of bamboo) 4. <i>Kain rumput</i> (skirt made of certain leaves) 5. <i>Noken</i> | Traditional Clothes: 1. Crown made of cassowary feathers or other birds 2. Gold Jewelry 3. <i>Sisir bambu</i> (comb made of bamboo) 4. <i>Ramino</i> 5. <i>Noken</i> |
| Means of Cultural Ceremony and others: 1. Plates and jar 2. Betel nut and <i>sirih</i> / areca 3. Boat | Means of Cultural Ceremony and others: 1. Plates and jar 2. Betel nut and <i>sirih</i> / areca 3. Boat |

Source: Primary Data, 2013

Generally, there are similarities, both in physical form and function of cultural objects owned by these tribes. Traditional clothes, jewelry, traditional marriage ceremonies devices in the form of plates and jars, or areca and betel, and art owned by these families are similar, except musical instrument such as *tifa* (traditional drum). Sumuri recognizes long tribal drum which is commonly called as 'Kefera' in Sebyar language, while short *tifa* called as *dimbane/atob*. Sebyar tribe also has tradition music made of bamboo called as *terummbe* which does not belong to Sumuri tribe.

Adat mat is one of cultural device that plays an important role of Sumuri and Sebyar tribes, primarily has functioned in the adat activities. In the past, adat mats is

used to hold adat activities, such as ceremonies, as well as meetings to discuss conflict resolution and so forth.

The mat is a cushion made from the leaves and used by people of both tribes to conduct traditional ceremonies, which co-exists with the other cultural device that are also important and vital to them, i.e. nut, *siring*, and lime for practicing 'chewing betel'.

At present, this belief is still held by people of both tribes, but the practice is no longer as stiff as in the past. Despite of using adat mat for adat activities, bench in the hall village or other cushion are more frequently used by people.

However, it does not mean that adat mat belief is completely eroded by various changes occurred. Although this belief has been physically replaced, indigenous spirit beliefs on adat mat still held firmly, especially when discussing vital matters related to the history and origin of the tribe or clan. The origin history is still living among them such as oral stories commonly spoken by the elders or young generation.

Anthropologically, the stories included in the category of myth believed by people to be the truth and guidance in cultural practices.

At the time of discussing matters related to this myth such as history of ancestors, adat mat must be provided unless could bring disaster or calamity. Therefore, narrative story-related history of the ancestors can not be told without adat mat. It is one of the local belief which are still alive and maintained by the people of both tribes to present.

Table II-171 Location of Sacred Objects

| No. | Location | Description | Coordinate Position |
|-----|--|--|-------------------------------------|
| 1 | <i>Kali Kobara</i> | Small river, streaming from a valley located between LNG Plant 1 and 1 st Security Post, estuary surrounding Jetty Construction | 02° 26' 10.8" S 133° 07' 54.2" E |
| 2 | <i>Kali Mai</i> (Nene Mai) | The place is located next to Kali Kobara, which is also situated between Kuburan Lama (old grave) and 1 st Security Post | 02° 26' 32.2" S 133° 07' 29.5" E |
| 3 | <i>Kuburan of Tanah Merah Lama</i> (Grave of Tanah Merah Lama) | Located next to the Jetty construction | 02° 26' 16.3" S 133° 07' 49.8" E |
| 4 | <i>Kayu Besi</i> (Wooden Iron) | Located at the peak of hill between LNG Plant 1 and 1 st Security Post | 02° 26' 18.6" S 133° 07' 55.5" E |

| No. | Location | Description | Coordinate Position |
|-----|---|--|---------------------------------------|
| 5 | Rumah Batu Keramat (Sacred Stone House) | Located outside the west fence between TMB Village and LNG site. | 02° 27' 01.3'' S 133° 06' 52.8'' E |

Source: Primary Data, 2013

For Irarutu communities, the origin of all humans in the world is derived from Mount Guri (Guri is equal to Mount Prophet; and this is the last name given by a Dutch priest named pastor I.S. Kijne, which was in the 1930s became the school principal in Mie). In these places, there are holes in the ground in which believed by all nations with different language in the world originated. This mountain is believed as sacred place up to now.

They also believe that the great flood had destroyed the world so that the first world was lost and now we live in the second world. This belief appears in their legends. They believe that man is composed of two forms, namely body, *tni*, and spirit, *gmon*, while the belly is the center of a feeling or emotion. In traditional beliefs, people believe that there are three types of Irarutu spirit alive and control of people in this world. The third spirit, respectively *kabi* spirit, evil spirit, *nia kabia*, *egtmen* demons or ghosts. These spirits can transform into humans (spirits) or wild animals which tend to harm humans. In order to avoid the spirit's attack to human, human is supposedly build good relationship with the spirits. Relationships can be built though giving offerings to the spirits. The offerings can be tobacco (cigarettes), betel, and coins. The offering materials are placed on the ground (a place where an activity will be carried out), then the people brought the offering prayer to invoke protection from the spirit. By doing so, Irarutu people believe that any kinds of activity they carry out will work well by the blessing from the spirit.

Based on the belief, Irarutu III people believe that there is spirit in the form of hydra in the vicinity of the airport. Hydra is derived from the Kuri (Mount of the Prophet). The time hydra arrived at this place, Babo has not yet shaped as island and without inhabitants. The deified hydra was named *kanaisi*. According to the informants, the clan ancestors also came from Fiawei clan from Kuri region who came to Babo simultaneously with the arrival of the hydra, *kanaisi*. The hydra resided in the spring (near the airport) which called as Babo until now. It means a new place for the Hydra and Fiawei clan. Another explanation from informants that the definition of "new" stands for Babo is derived from Biak language. However, there is no further information given about the background of Babo definition in the Biak language.

The sacred area as the dwelling place of hydra, *kanasi*, by Irarutu people, is surrounded by the sago trees near Babo airport, which is currently occupied by locals living in the tin-roofed shack. In this place, they often (especially residents of Fiawei clan) bring offerings including white chicken chop and blood, and then poured around the spring. These offerings are believed to be eaten by snakes,

kanaisi. According to their belief, at certain times, the god is transformed into a snake and comes into the place to tell about events that will occur in the future.

2.3.2.5 Vulnerable Community Group

Youth and women are not empowered and/or not yet fully empowered. At the time of the research conducted, youth and women organization did not entirely exist in villages where the both tribes dwell in. Despite this, in the future, youth and women will be developed in the social and cultural life. Youth has skills and capabilities that actually have great potential to be developed for the future of community. Unfortunately, up to the time the research was conducted, the role of youth seemed less than optimal. The conditions are less viable (non-decent). Lack of space for activities, such as employment, adequate education, and creative performance, are some of the factors affect the have less productive roles of Sumuri and Sebyar.

These conditions encourage the emergence of migration, especially among youth to leave home, go adventuring to other areas in the efforts to find a productive activities. However, a few young men who remain opted to stay at home are trying to create art and creativity spaces. In addition to art galleries filled by young people in TMB, Otoweri Village also has a fan group of young soccer sports who pursue their passion and often got achievement in various soccer competitions at regency level.

In the economic field, most of Sumuri and Sebyar youth also engage in assisting the main productive activities on livelihood such as marine products management and utilization. Fishing or catching fish in the ocean are the principal activities of youth. Recently, many of them also obtain jobs at some companies operated in Bintuni Bay and Berau Bay such as Tangguh LNG.

Meanwhile for women, who are traditionally described as strong and tough, also has a major role in community. Culturally, women's roles are placed only in domestic sphere, related to household affairs, and only serve to help men (husbands) for productive and public affairs, and do not on the position of leader. However, the actual role of women (*mama-mama*/mothers) is enormous in domestic life and in 'helping the husband', which certainly encourage women role to support better community.

Log into the woods, pick a tree with good quality of wood, cutting down trees and chopping wood, binding splited wood, and lifted a pile wood, are series of regular activity for *mama-mama* while helping husband looking for firewood in the forest. In addition to the searching for firewood, *mama-mama* has been well-known as an expert and reliable in pounding sago, which is the main food used as a staple menu for both tribes. In addition to forest, marine and surroundings are the locus of outdoor acitivities for Sumuri and Sebyar women. It is still in the realm of 'helping husband' that the assistance from their wives is symbolized 'help' and 'support' bridging the husband to easily perform productive work.

In Otoweri Village, *mama-mama* have been busy with various activities. While the male (father) is preparing to go to sea, some women were also to be participated, either on preparing her husband fishing needs, or keeping the catches from evening the day before, of course, without leaving household activities, such as taking care of children and so forth. At the afternoon before dusk, *mama-mama* are waiting in the two small jetties to welcome their husband (men) and come in a flurry of removing fish from net, sorting the fish for sale, cutting the shrimp heads, weighing fish catches in shelters, or offering the catches to buyer.

In addition to the economic life of household, Sebyar and Sumuri women also play various aspects of social life, such as the efforts to increase the maintenance of community health and disease prevention, also education, as well as areas of organizational groups for *mama-mama* in *PKK* (Family Welfare Education). In terms of the maintenance of community health and disease prevention, *mama-mama* are mentioned as the vanguard of actors in the villages where the two tribes dwelt. *Posyandu* (Integrated Health Center) cadres which are encouraged over again in the villages as a result of Integrated Social Program of Tangguh LNG, are entirely female (*mama-mama*) and has been carrying out its role optimally.

Some of the regular agenda of *Posyandu* like a baby weighing, implementation of *Posbumil* (Mother Center), as well as various agendas in health counseling concerns to prevention of communicable diseases, such as malaria (Malaria village cadre that are standby in every village), HIV/AIDS, influenza, and etc. These activities have been running regularly in the villages with the extraordinary support from Sumuri and Sebyar women, also some midwives and doctors in the villages.

Women role is tied to many kinds of community basic needs, such on the health support above. Consequently, it is important to implement planned and systematic efforts in order to involve women role in Sumuri and Sebyar community due to prosperity of the two tribes.

2.3.2.6 Adat Customary Rights

The role of clan institution or division in society fragmented in small social units (segmentary society) and who do not know central power is essentially egalitarian societies, such as those tribes in this study. Institutions clan is important because it controls the social relations between people in the clan in natural resources utilization belong to the clan, the reciprocal relationships and reproduction of social relations either domestic or inter-clan.

The role of clan in the regulation and utilization of natural resources such as clan power over its land, not over individual of clan members. Land rights on such tribes in Bintuni Bay is a communal rights which the utilization are governed by the head of clan. Functions of clan in reciprocal relations are playing role based on the lineage through the father, so it is patrilineal. Lineage customs is important because through

this way, members of the clan between generation to generation are bounded as well as clan and individual's ownership rights are maintained and inherited.

Likewise clan plays an important role in the regulation of marriage, that people in the same clan may not marry each other. Therefore, the principle of marriage adopted by tribes in Bintuni Bay is the nature of exogamy clan, means to marry outside their own clan. The principle of such marriages causes the bonds between the clans which vary in the same ethnic or between the clans of different ethnicity. Through inter-clan and inter-ethnic marriages, solidarity emerges between clan and ethnic groups.

Furthermore, clan acts as the organizing and monitoring institution against members of the community. These roles are manifested in the form of community members' life and the settlement of various disputes or conflicts between clan members and/or members from other clan. Thus, the role of institutions clan plays as one important element of social cohesion in the community on tribes in Bintuni Bay.

Cultural Rights

1. Adat Institution Empowerment

Adat institutions are one important life aspect of traditional society's tradition. The role of adat institutions is required in the social processes occurred within the community. Adat institutions also become aspiration forum to accommodate thoughts from each individual, clan, and local ethnic by providing input, criticism and advice to the relevant stakeholders. This is supported by the UN Law stipulated in the Article 18, which reads:

'Adat Community has the rights to participate in the process of making decisions with regard to the things that have an impact on their rights, through selected representatives in accordance with their procedures itself and also to develop and maintain the decision makers institution they have traditionally.'*

The study indicates that decision-making and aspirations related to communal rights are at the level of clan. Clan has decision-making authority to the social aspects that happen to them. All these responsibilities are generally delegated to the head of clan with the criteria described in the previous chapter. In decision on the wider scope, clan groups which are bounded in united community called as village, make a deal based on clan decision. For example, any matters related to customary right, the decision is in the clan level due to the ownership of existing resources such as land, forest, sago, shallow water areas (mangrove) is in the clan. When it comes to larger area such as included on the territory of several clans, the agreement will be decided by some clans exist in the related region. Other groups outside the clan do not have the right

to give a decision. Generally, they only serve as a facilitator in finding agreement between the parties concerned. In the areas, such in Mbaham Mata area, king who oversees petuanan the region has an important role in the processes agreements made. King could provide a view from the customs side, but all authority in decision-making remains in clan.

Clan-based adat institutions are considered important because it has strong legitimacy compared to the traditional institutions of other formations (eg: LMA) which is not derived from the roots of the community tradition.

2. Protection on Customary Territory

Today conflict related to customary land fairly widespread in Papua region. This situation must be addressed with the comprehensive and holistic approaches of various aspects of science. Protection and ownership identification on the customary land are major necessities regarding customary territory. This protection can prevent vertical and horizontal conflicts escalation. The conflict situation in the field do not only occur between government/private with local residents, but also among the local population. In the Article 32 of the UN Declaration:

- *Point 1: Indigenous People* have the right to determine and develop priorities and strategies for the development or use of their lands or territories and other resources.*
- *Point 2: States shall consult and cooperate in good faith with the indigenous people concerned through their own representative institutions in order to obtain their free and informed consent prior to the approval of any project affecting their lands or territories and other resources, particularly in connection with the development, utilization or exploitation of mineral, water or other resources.*

Customary land owned by clan groups in Bintuni as generally in Papua is communal. There are three aspects of the customary land ownership in Bintuni (1) *Property Rights*, property rights generally are in the level of clan; (2) *Utilization Rights*, the rights use generally adopted in some clan kinship or lineage or marriage relationships; (3) *The ownership rights of clan group*, is generally related to sacred places, burial ancestors, the old hamlet that are based on the history of clan groups in the past, or ancestral territories claimed in the beginning of the origin of some clan.

3. Protection on Focal and Sacred Places of Adat Community*

In traditional communities, their ethnic identity are commonly described in the mythology, both a haven or ancestors's journey and other places which are considered sacred. In addition, traditional communities also has broad aspects in the elaboration of territorial across ethnic groups because customary claim is also based on the mythology, ancestor's journey, a haven ancestors, the old village, and sacred aspects above. Maintenance and recognition of these values

are considered important by intent to preserve ethnic identity and a time to give benefit in development planning. It is also supported by the UN's IP Law reads:

'People who have the right to manifest, practice, develop and teach the traditions and customs and spiritual ceremonies as well as their religion; the right to maintain, protect and have access with privacy against religious sites and their cultural; right will use and control of their ceremonial objects, and rights to the repatriation of their remains.'

For example, a claim against an area in Babo is based on the sacred place named "kanaisi" in the area around Babo Airport. It is believed that a dragon inhabited the region which sometimes could resemble as humans. This mythology belongs to Fiawei clan, and is recognized by other clans so that the mythology can be used as a claim against area or region.

4. Protection on intellectual wealth, cultural heritage, traditional knowledge and cultural expressions of adat community*

Ethnic groups in the Bintuni Bay region is a group that has quite unique cultural diversity which need to be preserved through the mechanism planned by stakeholders involved in established institutions for that purpose. From the observation and interview of one of the oil and gas companies (BP), this company has conducted an inventoring through folk tales of Sebyar communities and compiling them into a reading book in three languages, namely: Sebyar, Indonesian, and English. Also nurturing and empowering groups of art originated from Weriagar and Mogotira villages.

Structural Rights

In the 1999 No.111 of the Presidential mentioned the boundary of The Smallest Adat Communities (KAT) i.e. socio-cultural groups that are local, dispersed and less or not involved in networking and service either social-economic or politics. The Presidential also mentions KAT characteristics as follows:

- a. A small community which is closed and homogeneous;
- b. Social institutions based on the kinship institutions;
- c. In general, geographically remote and relatively difficult to reach;
- d. In general, still living with subsistence economic systems;
- e. Simple equipment and technology;
- f. Highly depend on the local environment and natural resources;
- g. Limited access to social, economic and political services.

Based on the concept of the smallest adat communities and its characteristics, in particular point (c), point (d), point (e), point (f) and point (g), we can conclude some structural approach that needs to be done:

1. Education

Since adat community*/adat law* is defined as group of community with certain values and rights, they must obtain special treatment on education. The approaches of educational methods are delivered in accordance with the characteristics of adat community*. Besides education, there is also a customized educational material with peculiarity of each ethnic, for example, in terms of language, social institutions, living habits, livelihood system, and values system conveyed on the local customs and traditions.

Human resources is an important component in the process of development and construction which the core of development itself should be humanistic, i.e. development aimed at the welfare of mankind. Education itself should be a major element in achieving that goal. To achieve this, a local culture-based education approach should be implemented continuously, for example, local language use in local content education, as well as the educational approach based on culture, skill improvement and education. Protection on the children rights to get an education, for example, stipulated in the UN IP Act declaration, section 14:

- Point 1: *Indigenous People* have the right to establish and control their educational systems and institutions providing education in their own languages, in a manner appropriate to their cultural methods of teaching and learning;*
- Point 2: *Indigenous individuals, particularly children, have the right to all levels and forms of education of the State without discrimination;*
- Point 3: *States shall, in conjunction with indigenous peoples, take effective measures, in order for indigenous individuals, particularly children, including those living outside their communities, to have access, when possible, to an education in their own culture and provided in their own language.*

The education system can be tailored to meet the community needs, for example, skills training and work-related to their livelihood or other livelihood system that could be potentially done by the local community. A standardized public education given to children for preparing them as professionals in various fields in the future.

Education constraints emphasize on the vast area with lack accessibility to reach, for example, distant remote villages and limited access to reach the villages by means of transportation. An expensive transportation cost as well as low income levels also become several factors causing obstacles to local children for going to school.

In addition to several constraints above, a sufficient education facilities actually available in Tanah Merah Baru Village according to the researcher observation. Availability of education facilities proved through teachers support coming from outside village. The school helps village children to continue their education. The disadvantage children are also granted scholarships to continue their education in accordance with company requirement for future workforce.

The preparation of teaching staff resources is conducted by company (Tangguh LNG) cooperating with British Council through teaching staff and school principal trainings to obey the standards of teaching-learning and school maintainance as in appropriate way.

2. Health

Overall protection of the community health through three considerations, namely; (1) the ability to access healthcare services due to low economic level and still living in subsistence economic system in general; (2) the ability to access healthcare services due to geographical issues (remoteness and unaffordable); (3) limited access to social, economic and political services.

3. Economic Social

In the socio-economic aspects, adat community* has an traditional economic system which tends to be more subsistent. Economic principles perceived by adat community* are different from the principles of economic modern. Protection on the subsistence economies rights that depend on natural resources use of adat community* are supposedly put forward. It should be implemented, otherwise adat community* groups will be marginalized due to domination arises from several economic capital groups if any economic system changes from traditional to capital systems against adat community*. The impact will be very broad, including social conflicts occurrence in the region (e.g: NTB indigenous resistance against PT. Newmont or traditional farmer's resistance in the location of oil palm plantations in the North and South Sumatra regions).

2.3.2.7 Perception and Social Tension

In line with the terms of reference of AMDAL, social tension in Bintuni Bay can be divided based on its relationship with Tangguh LNG operations. However, it must be considered that the social tension, at this point, have a separate history with the presence of various other companies before Tangguh LNG, public administration transition, and social history on resources control by clan.

The available data can not provide an overview of the connection between histories of social tensions associated with social tensions related to Tangguh LNG operations. The following overview is based on the data collection conducted recently and need to be strengthened with an understanding of the relationship mentioned above, especially to understand the submitted arguments related to claim communities right or company obligation.

Social Tensions Directly Affected Tangguh LNG Operations

The data show that the direct social tension affected the operation of Tangguh LNG is related to customary right including land acquisition, as well as land rights of clan related to natural resources management on land as the main concern. Associated with shipping line and installation of offshore platform, customary rights related to marine resources management is also intended to be a major concern.

The land natural resources management related to clan power and at the village level, Petuanan.

Marine natural resources management related to broader power, but it is also more liquid, as it includes clans and villages, even tribes.

The type of social tension as follows:

- I. The division of areas classified as Directly Affected Villages (DAVs) and villages are not Directly Affected (non-DAVs), and the desire villages non-DAVs to be categorized as DAVs;
- II. Fishery activity disturbance and sea transportation accessibilities disturbance in Bintuni due to the enforcement of safety exclusive zone by Tangguh LNG, particularly for residents living in Tanah Merah and Saengga. The prohibition on access to the fishery resources is also experienced by fishermen who frequently catch fish in areas where the current offshore platforms has stood;
- III. Dissatisfaction with the AMDAL process and the implementation of the AMDAL Integrated Activity Tangguh LNG in 2002;
- IV. Social jealousy as a result of the recruitment process for Tangguh LNG workforce which is considered to give priority to certain villages, or a particular tribe or even to the migrants;
- V. The jealousy of the facilities in Tangguh LNG site compared to the existing facilities in the villages, among other availability of electricity, transportation and accommodations for employees in Tangguh LNG;
- VI. The local community demands regarding the adat compensation 'Knocking Door' - is an adat compensation paid by the societies entering certain customary land;
- VII. Social jealousy in the north shore of Bintuni Bay regarding development of housing and related facilities for Tanah Merah, Saengga and Onar villages as part of the Resettlement Project;

- VIII. Jealousy towards special programs received by Tanah Merah, Saengga and Onar villages as part of the Resettlement Project;
- IX. Unresolved claims over revenue sharing of gas for Indigenous People*, in which Sebyar on the north shore of the bay was entitled to the proceed from natural gas exploitation;
- X. The requirement for cultural heritage and sacred places recognition; and
- XI. Prior to the construction of Tangguh LNG facilities issues are considered by most residents not yet resolved by Tangguh LNG in the past, for example, forest fires in Taroy and Goras, and infant mortality in Sebyar region;
- XII. Community perception related to the electricity installation in the villages.

Social tensions Indirectly Affected Tangguh LNG Operations

The data show that the social tension do not directly affect the operation of Tangguh LNG associated with social welfare improvement in the villages. Improvement efforts are offered to other responsible parties, especially the government or can be transferred to other parties with equal material force. The tendency for having expectation is related to social welfare improvement associated with mentality of cargo cult. The type of social tension as follows:

- I. Different perceptions about revenue sharing of gas between the central government and local government of Bintuni Bay;
- II. Implementation of the planning process and the public demand for the villages and districts division in Teluk Bintuni Regency and Fakfak;
- III. Social tension in community with regard to the other projects activities in Surrounding Area of Tangguh LNG site;
- IV. Social tension around the protected forest areas, forest nature reserves and jungle tours with Forest Concession Holders (FCH) and operating concessions in Teluk Bintuni and Fakfak regencies;
- V. Community dissatisfaction on public service will lead to expectations for Tangguh LNG.
- VI. Demand from tribes and population of Bintuni Bay outside Tangguh LNG operations and Papua population generally expect to get benefit from Tangguh LNG, for example, in workforce, education, health and livelihood programs.

2.3.2.8 Stakeholders

| Stakeholders Mapping | |
|---|--|
| Issue | Related Stakeholders |
| Gas Allocation in West Papua | Village Community, Regencial Government, Provincial Government, National Government, and SKK Migas |
| Electricity | Village Community, Village Government, Regencial Government, Provincial Government, and local NGOs |
| Revenue Sharing | Village Community, Village Government, Regencial Government, Provincial Government, National Government, and SKK Migas |
| Improvement of Housing | Village Community, Adat Community, Village Government and Regencial Government |
| Adat Recognition (Wells Ownership, Knocking Door, and etc) | Village Community, Adat Community, Village Government, Regencial Government, Provincial Government, National Government, and SKK Migas |
| Workforce | Village Community, Adat Community, Village Government, and Regencial Government |
| Scholarship | Village Community, Adat Community, Village Government, and Regencial Government, and Local NGOs |
| Village Facilities and Infrastructure such as school, Puskesmas and Houses for Teaching Staff and Medical | Village Community, Adat Community, Village Government, and Regencial Government |
| Clean Water | Village Community, Village Government, and Regencial Government |
| Improvement of Community Economy | Village Community, Adat Community, and Village Government |
| Business Opportunities | Village Community, Village Government, and Regencial Government |
| Medical Personnel and Teaching Staff | Village Community, Village Government, and Regencial Government |
| AMDAL Implementation Monitoring | Village Community, Adat Community, Village Government, and Regencial Government |
| Village Division | Village Community, Adat Community, Village Government, Regencial Government, Provincial Government, and National Government |
| Fishery Activity Disturbance | Local Fishermen and Community living in the coastal village |
| Sea Transportation Accessibility Disturbance | Fishermen, Community on the coastal village, Local Syahbandar Office, and Regencial Government |
| Sea, Land and Public Transportation | Village Community, Village Government, and Regencial Government |
| Condensate and Waste Management | Village Community, Adat Community, Village Government, Regencial Government, Provincial Government, and National Government. |

2.4 PUBLIC HEALTH

The success of community health development requires good planning based on the precise and accurate data and information of health as well as quality, thus depicting the real situation (evidence based).

The Health Data and Information Book of West Papua Province of 2012 presents data and information on the state of socio-demographics, community health status, health efforts, and health resources at the provincial level are compiled by Regency/City as one of the references in preparing the Environmental Baseline of Community Health of ESIA and RKL-RPL Integrated Activity Plan of Tangguh LNG Expansion Project in Teluk Bintuni and Fakfak regencies, West Papua Province. The source of data was from:

- The Health Department of West Papua Province;
- The Data and Information Center of Health Ministry;
- The General Directorate of Health Services (BUK);
- The General Directorate of Disease Control and Environmental Health (PPPL);
- The General Directorate of Maternal and Child Health and Nutrition (MCH NUTRITION);
- The Development and Empowerment of Health Human Resources Agency (PPSDMK); and
- The Central Bureau of Statistics

The Health Data and Information Book of West Papua Province of 2012 is a guideline for implementing the Millennium Development Goals (MDGs).

The MDGs is a global development paradigm, declared Millennium Summit by 189 states members of the United Nations (UN) in New York in September, 2000. The legal basis of MDGs declaration issued is the UN General Assembly of the United Nations No. 55/2 dated on September 18th, 2000 (A/Ris/55/2 the United Nations Millennium Development Goals).

In Public Health, West Papua Province drafted several indicators to facilitate the implementation of action plan at the provincial, regencial/city, district to the village level.

MDG Indicators of West Papua Province in 2007 showed that the percentage of households that have access to adequate sanitation facilities by 26.5% and in 2010 increased to 48% (source: Data and Health Information of West Papua Province 2012, page 23). The target is to halve the proportion of people without access to safe sanitation.

MDG Indicators of West Papua Province in 2007 showed that the percentage of *Annual Parasite Incidence Malaria* per 1.000 population is 15,65% at risk and in 2010 slightly decline to 10.6% (source: Data and Health Information of West Papua Province 2012, page 23).

MDG Indicators of West Papua Province in 2007 showed that the percentage of early diagnosis for **Pulmonary TB** is 44.9% and in 2010 decline to 39.9% (source: Data and Health Information of West Papua Province 2012, page 23).

MDG Indicators of West Papua Province in 2007 showed that the percentage of **Children Under-five Malnutrition** is 6.8% and in 2010 increase to 9.1% (source: Data and Health Information of West Papua Province 2012, page 23).

2.4.1 Disease Patterns and Illness Level

2.4.1.1 Teluk Bintuni Regency

The common disease suffered by many people in Bintuni Bay region are infectious diseases and communicable diseases such Upper Respiratory Infection (Acute URTI),, diarrhea and malaria. In addition, this region also reported several cases of communicable diseases which not included in the ten common diseases are HIV/AIDS and pulmonary TB.

Table II-172 Ten Common Diseases in Teluk Bintuni Regency

| No. | Type of Disease | Total of Incidence |
|-----|---|--------------------|
| 1 | Acute Upper Respiratory Tract Infection | 5,997.00 |
| 2 | Musculoskeletal Disease | 5,653.00 |
| 3 | Upper Respiratory Tract Infection | 3,571.00 |
| 4 | Other Upper Respiratory Tract Infection | 3,375.00 |
| 5 | Diarrhea (included cholera suspected) | 2,311.00 |
| 6 | Allergy | 1,726.00 |
| 7 | Skin Infection | 1,437.00 |
| 8 | Accident and Trauma | 1,415.00 |
| 9 | Malaria without clinical examination | 1,247.00 |
| 10 | Other diseases | 5,154.00 |

Source : Teluk Bintuni Regency in Figure, 2012

The progression of HIV/AIDS in Teluk Bintuni Regency in 2009 - 2013 is provided in the following table:

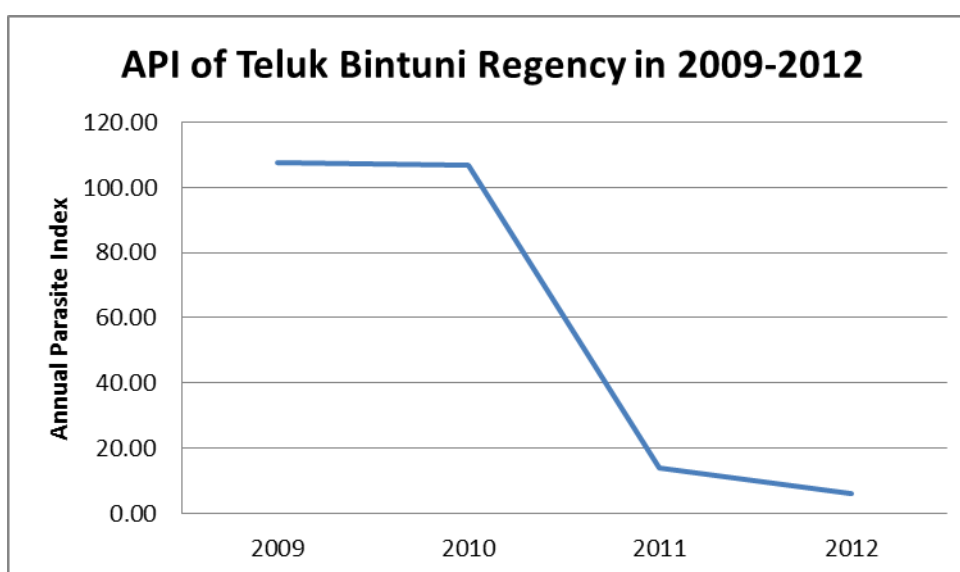
Table II-173 HIV/AIDS in Teluk Bintuni Regency in 2009-2013

| Year | HIV+ | AIDS | Total | Death | Number of People Living |
|--------------|-----------|-----------|-----------|-----------|-------------------------|
| 2009 | 6 | 19 | 25 | 11 | 14 |
| 2010 | 1 | 17 | 18 | 11 | 7 |
| 2011 | 7 | 11 | 18 | 3 | 15 |
| 2012 | 6 | 20 | 26 | 7 | 19 |
| 2013 | 4 | 4 | 8 | 2 | 6 |
| Total | 24 | 71 | 95 | 34 | 61 |

Source : Teluk Bintuni Regency in Figure, 2012

In case of tuberculosis, it has been a serious disease in Teluk Bintuni Regency because the conversion rate (17%) and treatment success rate are still very low (4%) though suspects have been widely covered. It is found that low treatment rate is influenced by people habit of moving from one to another place, that finally cause difficulty for health staffs to control the compliance of TB patients to take medication.

Diarrhea is also one of diseases that cause high number of death in 2010 in this region. Malaria has also become the focus of efforts to overcome health problems in Teluk Bintuni Regency since 2009. Successful prevention of malaria in this region has shown significant results in terms of indicators when the API (Annual Parasite Index) has declined to 6.16 in 2012. The following charts explain the development of API in 2009-2012:

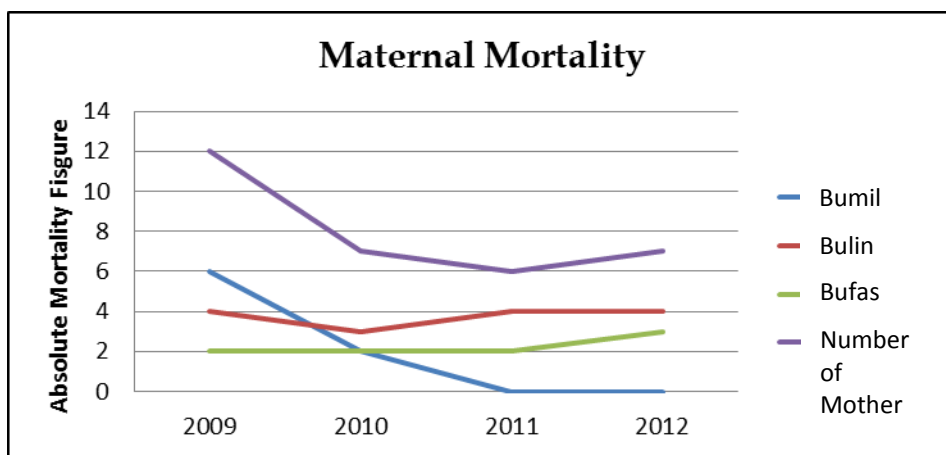


Source : Health Department of Teluk Bintuni Regency in Figure, 2012

Figure II-228 API of Teluk Bintuni Regency in 2009-2012

Based on prevalence data, the pattern of disease in Teluk Bintuni Regency generally on ten main diseases (table above) shows that communicable disease is more dominant than non-communicable diseases (Health Profile of Teluk Bintuni Regency of 2012).

Regarding the description of maternal and child health, maternal mortality (pregnant women) has been reduced to no maternal deaths in Bintuni Bay. However, there are still limited equipments, medicines and medication experts in a given period causes the quality of obstetric referral services can not be maintained routinely, so the maternal and puerperal women mortality have not been able to be reduced significantly. The chart of the development of mortality can be described as follows:



Source : Health Department of Teluk Bintuni Regency in Figure, 2012

Figure II-229 Graphic of Maternal Death in Bintuni Bay in 2009-2012

According to the Directorate of Health Promotion of Health Ministry, There are ten indicators of Clean and Healthy Behavior in household (family) as follows:

1. **Delivery assisted by medical personnels:** medical personnels defined here are doctors, midwives and other health-care staffs. Some people still rely on non-medical personnel to help with the baby delivery, such as assisted by traditional midwives. In addition to unsafety and not sterile, delivery by traditional midwives can trigger greater risk of maternal and infant mortality.
2. **Giving exclusive breast milk to Infants:** a mother can give her baby the exclusive breast milk without other food and water supplement from the age of zero to six months.
3. **Weighing toddlers each month:** weighing babies and toddlers each month aims to monitor the toddlers growth regularly. Weighing is carried out by Posyandu (Integrated Health Post) ranging from 1 month to 5 years old. After weighing, the results is in a reported in a KMS (Healthy Card) book. This will help mothers recognizing the development of toddlers.

4. **Using clean water:** Clean water use for daily life such as cooking, bathing, even drinking water needs. Unsanitary water contains a lot of germs and bacterias that can cause various diseases.
5. **Washing hands with soap:** washing hands with soap and running water can eliminate a wide range of germs and dirt on hands, thus, clean and germ-free hands. This activity is recommended for hand washing done regularly before eating and doing activities using hands, such as holding money and animals, after defecating, before handling food and before feeding the baby.
6. **Using Healthy Latrine:** latrine is a room equipped with human waste disposal facilities consisting of squatting or sitting place with a goose neck or without neck goose (pit) which is equipped with a septic tank and water to clean it. There are several requirements for a healthy latrine, which does not contaminate drinking water, no smell, can not be touched by insects and rodents, do not pollute the surrounding soil, easy to clean and safe to use, equipped with protective walls and roofs, adequate lighting and ventilation, watertight floor, as well as water, soap, and cleaning equipments availability.
7. **Combating flick at home once a week:** practicing Flick Periodic Inspection (PJB) in a domestic environment. PJB is a regular activity (every week) of checking mosquito breeding that exists at home, such as bathtub, toilet, flower vases, refrigerator, and outside the home such as gutters. In addition, also practicing Mosquito Nest Elimination (PSN) through of 3M (Draining, Bury, and Closing).
8. **Eating fruits and vegetables everyday:** eating fruits and vegetables are highly recommended because they give various vitamins, fiber and minerals that are beneficial to body.
9. **Physical activity everyday:** physical activity, either sports or other activities can emit energy which is essential to the maintenance of physical, mental, and quality of life to keep staying healthy and fit throughout the day. Type of physical activity that can be done in everyday life i.e. walking, gardening, washing clothes, and others.
10. **No smoking in the house:** a cigarette smokes produces more than 4,000 harmful chemicals, such as nicotine, tar, and carbon monoxide.

Based on the above indicators, generally it can be concluded that Clean and Healthy Behavior in Bintuni Bay community is not effectively applied.

Nutritional Status

Indicators of nutritional status can be referred to LBW (Low Birth Weight) and malnutrition in infants / toddlers / children in Teluk Bintuni Regency. Based on the available reports from 2009 to 2011, severe malnutrition in infants are always found. However, there is a tendency on better nutritional status of infants in this region. To obtain the Figure of nutritional status development, can be seen in the following table:

Table -174 Total of Newborn, Low Birth Weight (LBW) and Malnutrition Infants in Teluk Bintuni Regency

| Year | Birth | LBW | | Malnutrition |
|------|-------|-------|-------------------|--------------|
| | | Total | Refferal Patients | |
| 2009 | - | - | | 100 |
| 2010 | 881 | 8 | 2 | 18 |
| 2011 | 1.118 | 9 | 9 | 10 |

Source : Regional Stakeholders Meeting, 2013

Data of disease pattern in six districts of surveyed areas described as follows:

a. Weriagar District

The following data indicates the most frequent number of disease in Weriagar District sourced from Health Department (2012):

Table II-175 Ten Common Diseases Recorded by Puskesmas in Weriagar District

| No. | Diseases | Total |
|-----|---|-------|
| 1 | Acute Upper Respiratory Tract Infection | 667 |
| 2 | Musculoskeletal Disease | 316 |
| 3 | Other Diseases | 272 |
| 4 | Skin Infection | 203 |
| 5 | Diarrhea | 158 |
| 6 | Accident and Trauma | 131 |
| 7 | Allergy | 79 |
| 8 | Helmintic infection | 64 |
| 9 | Infection of Middle Ear (otitis media) | 36 |
| 10 | Pneumonia | 15 |

Source : Local Stakeholders Meeting, 2013

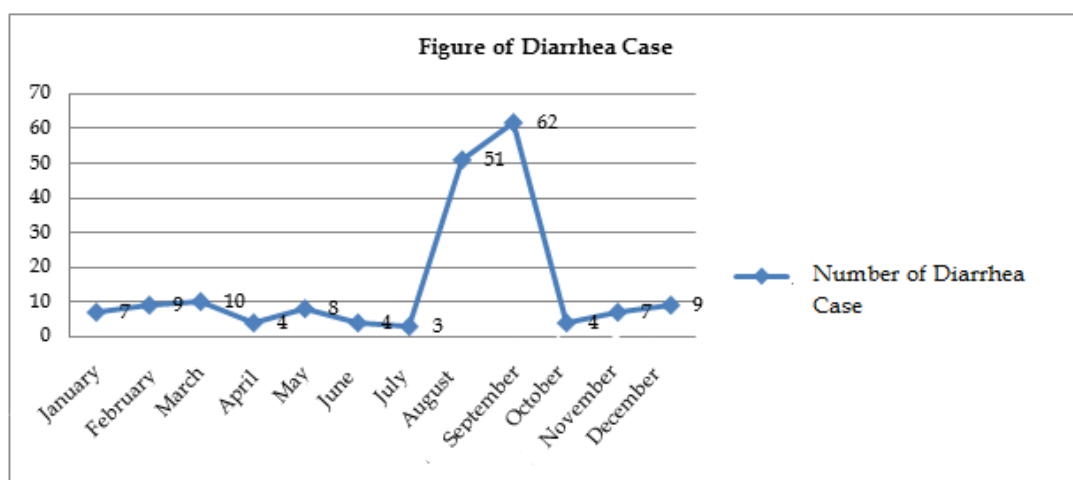


Figure II-230 Pustu in Weriagar District

The ten common diseases in the table above indicate Acute URTI (Acute Upper Respiratory Tract Infection) as the most suffered diseases. The second and third diseases are Musculoskeletal Disease, and other diseases.

Acute Upper Respiratory Tract Infection disease is suffered by dominant community in Weriagar District caused by a lack of good nutrition and sanitation environment, unadopted a clean and hygiene behavior in the community, as well as a communal lifestyle that is still applicable in society, for example, inadequate spacious of house because more than three heads of the family staying at house.

Diarrhea is at fifth position of most suffered disease, which in many cases occur in Mogotira i.e. 22 cases. From the data chart the incidence of diarrhea in children aged less than five years in 2012, can be seen as follows:



Source : Regional Stakeholders Meeting, 2013

Figure II-231 Graphic of Diarrhea Rate in Children Aged Below 5 Years

In addition, data from the Work Meeting of Community Hygiene Promotor (PKM) in Weriagar, 2013, described the rate of malnutrition, maternal mortality, infant mortality, neonatal mortality and the number of malaria patients.

Table II-176 Malnutrition on Toddlers and Infants

| No. | Village Name | Infant | | | | | | Toddlers | | | | | |
|-----|----------------|----------------|---------|----|--------------|---------|----|----------------|---------|----|--------------|---------|---|
| | | Less Nutrition | | | Malnutrition | | | Less Nutrition | | | Malnutrition | | |
| | | Target | absolut | % | Target | absolut | % | Target | absolut | % | Target | absolut | % |
| 1 | Tuanaikin | 5 | 0 | 0 | 5 | 1 | 20 | 23 | 8 | 35 | 23 | 0 | 0 |
| 2 | Weriagar Baru | 4 | 0 | 0 | 4 | 0 | 0 | 26 | 6 | 23 | 26 | 1 | 4 |
| 3 | Weriagar Induk | 20 | 4 | 20 | 20 | 0 | 0 | 75 | 10 | 13 | 75 | 3 | 4 |
| 4 | Weriagar | 21 | 3 | 14 | 21 | 1 | 4 | 56 | 21 | 38 | 56 | 1 | 2 |
| 5 | Weriagar Utara | 7 | 0 | 0 | 7 | 0 | 0 | 20 | 6 | 30 | 20 | 0 | 0 |
| 6 | Weriagar | 7 | 0 | 0 | 7 | 1 | 14 | 20 | 4 | 20 | 20 | 0 | 0 |

Source : Regional Stakeholders Meeting, 2013

Data of malaria patient collected by Puskesmas (Community Health Center) has been detailed based on gender and parasite causes.

Type of Parasites (*Plasmodium*) cause malaria as follows:

- *Plasmodium falciparum* (Pf-tropical malaria)
- *Plasmodium vivax* (Pv-tertiary malaria)
- *Plasmodium malarie* (Pm-quaternary malaria)
- *Plasmodium ovale* (Po-in Eastern Indonesia dan Afrika)

Table II-177 Malaria Patients

| No. | Village Name | Total Population | Malaria Patients | | Type of Parasites | | | | | | |
|-----|------------------|------------------|------------------|--------|-------------------|----|----|----|-----|-------|---|
| | | | Male | Female | Pf | Pv | Pm | Po | Mix | Total | |
| 1 | Weriagar Induk | 806 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2 | Mogotira | 293 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3 | Weriagar Selatan | 186 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4 | Weriagar Utara | 144 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5 | Tuanaikin | 152 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6 | Weriagar Baru | 163 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Source : Regional Stakeholders Meeting, 2013

b. Tomu District

Survey result of UGM in 2011 obtained types and symptoms data of the disease as listed in the following table:



Figure II-232 Traditional Midwife Training

Table II-178 Ten Common Diseases Recorded by Puskesmas in Tomu District

| No. | Diseases | Total of Cases |
|-----|---|----------------|
| 1 | Acute Upper Respiratory Tract Infection | 1,373 |
| 2 | Musculoskeletal Disease | 1,159 |
| 3 | Other disease | 1,005 |
| 4 | Gastrointestinal Infection | 327 |
| 5 | Diarrhea | 289 |
| 6 | Allergy | 179 |
| 7 | Fungal infection of the skin | 164 |
| 8 | Accident and Trauma | 159 |
| 9 | Skin Infection | 127 |
| 10 | Other eye diseases | 104 |

Source : Regional Stakeholders Meeting, 2013

Survey data of disease patterns in the puga table combines between the type and symptoms of the disease such as the survey results on other districts. Assumed from symptoms such as high fever, cough, and gonorrhoea can be said that the disease classified as infectious diseases. Based on the percentage of patients in the four main surveyed districts, the most disease of Tomu District was influenza (71.3%). Influenza also includes as types of infectious diseases. Of the types and symptoms of the disease pattern, Tomu District is dominantly infected due to less healthy environment.

c. Babo District

Health facilities of Babo District are located in Puskesmas in Irarutu III. The coverage area of Puskesmas Babo is the whole village in Babo District and Aroba District since Aroba only has Pustu (Supporting Community Health Center). The disease symptoms that most suffered by people in Babo District are Acute Upper Respiratory Tract Infection, gastritis and myalgia.



Figure II-233 HIV Peer Educator Training

Table II-179 Ten Common Diseases Recorded by Puskesmas in Babo District

| No. | Symtoms | Percentage |
|-----|---|------------|
| 1 | Acute Upper Respiratory Tract Infection | 1,880 |
| 2 | Gastritis | 563 |
| 3 | Myalgia | 257 |
| 4 | Musculoskeletal Disease | 198 |
| 5 | Diarrhea | 180 |
| 6 | Skin and Subcutaneous Tissue Disorder | 234 |
| 7 | High Blood Tension | 246 |
| 8 | Accident and Trauma | 135 |
| 9 | Cephalgya | 179 |
| 10 | Oral disease and dental caries | 138 |

Source : Regional Stakeholders Meeting, 2013

Description of disease pattern in Babo District showed that infectious diseases (communicable disease) is more dominant than non-infectious diseases (not communicable disease), especially the vast majority were influenza (37.1%).

In addition, data from Health Service Activity of Puskesmas Babo in 2013, describing the rate of maternal mortality, malnutrition, infant mortality, neonatal mortality and the number of malaria patients.

Detection of high risk factors on pregnant women in Puskesmas is essentially conducted to reduce maternal mortality. This work is done in line with the goals of Puskesmas, namely: accelerating infant mortality decline; improving maternal health services to reduce infant mortality; enhancing the ability of community to develop community activities in improving the ability of healthy life; and an increase in equity and health services to the community in an effort to cover entire population and geographical area.

Table II-180 High Risk on Pregnant Women

| No. | Village Name | Total Population | Total of Pregnant Women | High Risk Early Detection |
|--------------|--------------|------------------|-------------------------|---------------------------|
| 1 | Modan | 808 | 37 | 1 |
| 2 | Kasira | 655 | 23 | 2 |
| 3 | Nusei | 650 | 28 | 5 |
| 4 | Kanaisi | 153 | 1 | 0 |
| 5 | Sidomakmur | 489 | 12 | 0 |
| 6 | Wimbrow | 245 | 6 | 1 |
| 7 | Yaru | 680 | 4 | 0 |
| 8 | Aroba | 91 | 9 | 0 |
| 9 | Sanguar | 128 | 2 | 0 |
| 10 | Wame | 130 | 6 | 0 |
| Total | | 4,029 | 128 | 9 |

Source : Regional Stakeholders Meeting, 2013

The number of pregnant women based on Puskesmas data in 2012, as many as 128 people with top-ranked number of pregnant women as many as 37 people in Modan Village, while Kanaisi Village has the lowest rank as many as one pregnant women.

Detection of high-risk on pregnant women mostly came from Nusei Village as many as five people, followed by Kasira, Modan and Wimbrow villages with each of two people, one person and one person. Maternal mortality rates in Babo District recorded in Wimbrow Village and Sidomakmur Village as many as one person of each.

Also in Nusei Village recorded an infant born in death, as well as similarly occurred in the villages of Modan and Kasira. Neonatal mortality occurred more in Nusei Village as many as two children and followed by Modan and Kasira as many as one child in each villages.

Table II-181 Mortality of Maternal, Infant, and Neonatal

| No. | Village Name | Maternal Mortality | Condition of Newborn | | Neonatal Mortality |
|--------------|--------------|--------------------|----------------------|------------|--------------------|
| | | | Born Alive | Born Dying | |
| 1 | Modan | 0 | 0 | 1 | 1 |
| 2 | Kasira | 0 | 0 | 1 | 1 |
| 3 | Nusei | 0 | 1 | 1 | 2 |
| 4 | Kanaisi | 0 | 0 | 0 | 0 |
| 5 | Sidomakmur | 1 | 0 | 0 | 0 |
| 6 | Wimbrow | 1 | 0 | 0 | 0 |
| 7 | Yaru | 0 | 0 | 0 | 0 |
| 8 | Aroba | 0 | 0 | 0 | 0 |
| 9 | Sanguar | 0 | 0 | 0 | 0 |
| 10 | Wame | 0 | 0 | 0 | 0 |
| Total | | 2 | 1 | 3 | 4 |

Source : Regional Stakeholders Meeting, 2013

Based on the data recorded in 2012, Puskesmas Babo has five people in Irarutu III Village suffered from pulmonary TB (suspected) though after examination it turns out only one person is positive. Similarly, in the villages of Nusei, Kasira, Sidomakmur, Wimbrow and Yaru have been recorded each suspects respectively - were as much as two people, one person, one person, one person and one person, after examination then there is only a person get suspected positive pulmonary TB in Yaru Village.

Table II-182 Pulmonary TB Suspect

| No. | Village Name | Suspect | BTA Positive |
|--------------|--------------|-----------|--------------|
| 1 | Irarutu III | 5 | 1 |
| 2 | Kasira | 1 | 0 |
| 3 | Nusei | 2 | 0 |
| 4 | Sidomakmur | 1 | 0 |
| 5 | Wimbrow | 1 | 0 |
| 6 | Yaru | 1 | 1 |
| 7 | Aroba | 0 | 0 |
| 8 | Amutu | 0 | 0 |
| Total | | 11 | 2 |

Source : Regional Stakeholders Meeting, 2013

An indicator of malnutrition on infants and toddlers is low bodyweight or bodyweight does not go up in a certain period. In Modan Village, there has been a data record of the highest malnutrition suspected on infants and toddlers as much as 18%, and a further three villages, namely Kasira, Aroba and Wimbrow respectively amounted to 16%, 12%, and 12%.

Table II-183 Malnutrition

| No. | Village Name | Total of Infant/Toddler | Weight does not go up | Malnutrition Suspects (%) |
|-----|------------------|-------------------------|-----------------------|---------------------------|
| 1 | Modan | 141 | 25 | 18 |
| 2 | Irarutu / Kasira | 98 | 16 | 16 |
| 3 | Nusei | 140 | 16 | 11 |
| 4 | RKI Sidomakmur | 88 | 7 | 8 |
| 5 | Wimbro | 69 | 8 | 12 |
| 6 | Yaru | 34 | 3 | 9 |
| 7 | Aroba | 42 | 5 | 12 |
| 8 | Sanguar | 41 | 4 | 10 |
| 9 | Wame | 41 | 3 | 7 |

Source : Regional Stakeholders Meeting, 2013

d. Aroba District

Based on survey and census conducted by PSKK-UGM, the disease symptoms that most commonly found are headache, followed by itching and influenza, which amounted to 16.7%.

Table II-184 Pattern of Disease in Aroba District in 2011

| No. | Symtoms | Percentage |
|-----|--|------------|
| 1 | High Fever | 20 |
| 2 | Cough more than three weeks | 0 |
| 3 | Diarrhea | 3,3 |
| 4 | Headache | 26.7 |
| 5 | Itching | 16.7 |
| 6 | Seizure | 6.7 |
| 7 | Influenza | 16.7 |
| 8 | Other disease symptom (low back pain, nausea, urinary) | 3.3 |
| 9 | Sprain | 6.7 |

Source : Survey and Census by UGM, 2011

e. Sumuri District

Type of disease most often suffered by people in Sumuri District is ARI, Musculoskeletal Disease.

Table II-185 Ten Common Diseases Recorded by Puskesmas in Tofoi

| No. | Disease | Total of Cases |
|-----|-----------------------------|----------------|
| 1 | Acute Respiratory Infection | 1,485 |
| 2 | Musculoskeletal Disease | 448 |
| 3 | Gastritis | 333 |
| 4 | Musculoskeletal Disease | 318 |
| 5 | Skin Infection | 217 |
| 6 | GEA/Tropika | 217 |
| 7 | Vulnus/Accident | 125 |

| No. | Disease | Total of Cases |
|-----|------------------|----------------|
| 8 | Clinical Malaria | 95 |
| 9 | Nerve disorder | 80 |
| 10 | Leprosy | 6 |

Source : Regional Stakeholders Meeting, 2013

Table II-186 Ten Common Diseases Recorded by Puskesmas in Tanah Merah Baru

| No. | Disease | Total of Cases |
|-----|---|----------------|
| 1 | Acute Respiratory Infection | 985 |
| 2 | Skin Infection | 231 |
| 3 | Musculoskeletal Disease | 230 |
| 4 | Allergy | 91 |
| 5 | Diarrhea | 80 |
| 6 | Accident and Trauma | 72 |
| 7 | Helminthic infection | 53 |
| 8 | Tropical Malaria (<i>P. Falciparum</i>) | 43 |
| 9 | Fungal infection of the skin | 40 |
| 10 | High Blood Pressure | 33 |

Source : Regional Stakeholders Meeting, 2013

From the above table description in the villages of Sumuri District suggest the disease pattern in this district is dominated by infectious diseases than non-infectious diseases.

Furthermore, malaria patients in Puskesmas Tofoi and Tanah Merah can be seen on **Table II-192** dan **Table II-193**.

Table II-187 Malaria Patients in Puskesmas Tofoi

| No. | Village Name | Total Population | Malaria Patients | | Type of Parasite | | | | | |
|--------------|---------------|------------------|------------------|-----------|------------------|----------|----------|----------|----------|-----------|
| | | | Male | Female | Pf | Pv | Pm | Po | Mix | Total |
| 1 | Tofoi | 1,552 | 25 | 15 | 35 | 2 | 0 | 0 | 2 | 39 |
| 2 | Padang Agoda | 777 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 1 |
| 3 | Materabu Jaya | 577 | 2 | 0 | 1 | 1 | 0 | 0 | 0 | 2 |
| 4 | Furada | 567 | 1 | 1 | 2 | 1 | 0 | 0 | 0 | 3 |
| Total | | 3,473 | 29 | 16 | 38 | 5 | 0 | 0 | 2 | 45 |

Source : Regional Stakeholders Meeting, 2013



Figure II-234 Malaria Campaign Activity in Onar Village, Sumuri District

Table II-188 Malaria Patients in Puskesmas Tanah Merah

| No. | Village Name | Total Population | Malaria Patients | | Type of Parasite | | | | | |
|--------------|--------------|------------------|------------------|-----------|------------------|----------|----------|----------|-----------|-----------|
| | | | Male | Female | Pf | Pv | Pm | Po | Mix | Total |
| 1 | Tanah Merah | 793 | 26 | 24 | 38 | 1 | 0 | 0 | 11 | 50 |
| 2 | Saengga | 747 | 2 | 2 | 4 | 0 | 0 | 0 | 0 | 4 |
| 3 | Onar Lama | 151 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| 4 | Onar Baru | 272 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total | | 1,963 | 29 | 26 | 43 | 1 | 0 | 0 | 11 | 55 |

Source : Regional Stakeholders Meeting, 2013

Community health data obtained from Puskesmas Tofoi and Tanah Merah have included examination of Antenatal Care (ANC) for pregnant women and post delivery. Examination of ANC results a great benefit through the early examination of a variety of risks and complications of pregnancy, so that pregnant women are advised earlier to get referral medication (Manuaba, 1998).

Table II-189 High Risk on Pregnant Women

| No. | Village Name | Total Population | Total of Pregnant Women | High Risk Detection |
|--------------|---------------|------------------|-------------------------|---------------------|
| 1 | Tofoi | 1,552 | 81 | 20 |
| 2 | Padang Agoda | 98 | 14 | 4 |
| 3 | Materabu Jaya | 577 | 23 | 15 |
| 4 | Furada | 567 | 32 | 8 |
| 5 | Inti | 777 | 30 | 10 |
| Total | | 3,571 | 180 | 57 |

Source : Regional Stakeholders Meeting, 2013

The data also recorded a pregnant woman and a newborn baby died in Forada Village.

Table II-190 Mortality of Maternal, Infant, and Neonatal

| No. | Village Name | Maternal Mortality | Condition of Newborn | | Neonatal Mortality |
|--------------|---------------|--------------------|----------------------|------------|--------------------|
| | | | Born Alive | Born Dying | |
| 1 | Tofoi | 0 | 0 | 0 | 0 |
| 2 | Padang Agoda | 0 | 0 | 1 | 1 |
| 3 | Materabu Jaya | 0 | 1 | 0 | 1 |
| 4 | Furada | 1 | 1 | 0 | 1 |
| 5 | Inti | 1 | 0 | 2 | 0 |
| Total | | 2 | 2 | 3 | 3 |

Source : Regional Stakeholders Meeting, 2013

Table II-191 High Risk on Pregnant Mother

| No. | Village Name | Total | Total of Pregnant Women | High Risk Detection |
|--------------|------------------|--------------|-------------------------|---------------------|
| 1 | Tanah Merah Baru | 793 | 25 | 5 |
| 2 | Saengga | 747 | 19 | 2 |
| 3 | Onar Lama | 151 | 4 | 1 |
| 4 | Onar Baru | 272 | 6 | 2 |
| Total | | 1.963 | 54 | 10 |

Source : Regional Stakeholders Meeting, 2013

Early High Risk Detection Data in Tofoi shows higher tendency than Tanah Merah. It concludes from higher neonatal mortality rates in Tofoi than Tanah Merah.

Table II-192 Mortality of Mother, Infant, and Newborn

| No. | Village Name | Maternal Mortality | Condition of Newborn | | Neonatal Mortality |
|--------------|------------------|--------------------|----------------------|------------|--------------------|
| | | | Born Alive | Born Dying | |
| 1 | Tanah Merah Baru | 0 | 0 | 0 | 0 |
| 2 | Saengga | 0 | 0 | 0 | 0 |
| 3 | Onar Lama | 0 | 0 | 0 | 0 |
| 4 | Onar Baru | 0 | 1 | 0 | 1 |
| Total | | 0 | 1 | 0 | 1 |

Source : Regional Stakeholders Meeting, 2013

f. Kamundan District

Type of disease most suffered by community of Kamundan District is Acute Respiratory Infection, diarrhea and accident and trauma. The description is presented in the following table:

Table II-193 Pattern of Disease in Puskesmas Kalitami in 2012

| No. | Type of Disease | Percentage |
|-----|------------------------------|------------|
| 1 | Acute Respiratory Infection | 208 |
| 2 | Accident and Trauma | 197 |
| 3 | Diarrhea | 187 |
| 4 | Clinical Malaria | 183 |
| 5 | Rheumatoid | 180 |
| 6 | Eye disease | 88 |
| 7 | Fungal infection of the skin | 41 |
| 8 | Eye disease | 31 |
| 9 | Ear infection | 13 |
| 10 | Pulmonary TB | 10 |

Source : Regional Stakeholders Meeting, 2013

Nationally, many cases of Chronic Energy Deficiency (CED) are primarily caused by the possibility of an imbalance of nutrient intake, so the nutrients needed for body are not sufficient. This resulted the lack of growth of either physical or mental body as it could be. Many children who were very thin due to poor nutrition or often called as malnutrition. If it is too long then it may cause Chronic Energy Deficiency (CED).

Table II-194 Coverage of Pregnant Women with Chronic Energy Deficiency (CED)

| No. | Village Name | Toal Population | Target of Pregnant Women |
|--------------|--------------|-----------------|--------------------------|
| 1 | Kalitami I | 189 | 4 |
| 2 | Kalitami II | 147 | 4 |
| 3 | Bibiram | 260 | 6 |
| 4 | Kenara | 131 | 3 |
| 5 | Maroro | 107 | 3 |
| Total | | 834 | 20 |

Source : Basic Data of Puskesmas Kalitami, 2012

2.4.1.2 Fakfak Regency

There are ten common diseases in Fakfak Regency listed on the following table:

Table II-195 Ten Common Diseases in Fakfak Regency

| No. | Disease Symtoms | Total |
|-----|---|--------|
| 1 | Acute Respiratory Infection | 30,197 |
| 2 | Rheumatoid | 9,380 |
| 3 | Malaria | 8,540 |
| 4 | Gastritis | 6,172 |
| 5 | Skin infection | 6,170 |
| 6 | Acute Upper Respiratory Tract Infection | 4,778 |
| 7 | Diarrhea | 3,950 |

| No. | Disease Symtoms | Total |
|-----|-----------------------|-------|
| 8 | High Blood Pressure | 2,882 |
| 9 | Allergy | 2,712 |
| 10 | Anemia/ Fe deficiency | 2,259 |

Source : Fakfak Regency in Figure, 2011

Acute Respiratory Infection prevalence results the highest number of disease in Fakfak Regency similarly to Teluk Bintuni Regency or even occurred to West Papua Province and Indonesia, generally. On the other hand, there are ten common diseases based on inpatient data in RSUD Fakfak during 2010-2011 as follows:

Table II-196 Ten Common Diseases suffered by Inpatients in RSUD Fakfak in 2010 and 2011

| No. | In 2010 | | No. | In 2011 | |
|-----|-----------------------------|-------|-----|-----------------------------|-------|
| | Type of Disease | Total | | Type of Disease | Total |
| 1 | Tropical Malaria | 691 | 1 | Malaria | 1,277 |
| 2 | GEA/Tropika | 346 | 2 | Acute Respiratory Infection | 588 |
| 3 | Dyspepsia | 339 | 3 | Dyspepsia | 271 |
| 4 | Clinical Malaria | 237 | 4 | Rheumatoid | 265 |
| 5 | Tertiary Malaria | 259 | 5 | Pneumonia | 227 |
| 6 | Pulmonary TB | 148 | 6 | High Blood Pressure | 192 |
| 7 | Urinary tract infection | 131 | 7 | Diarrhea | 182 |
| 8 | High Blood Pressure | 118 | 8 | Migraine | 125 |
| 9 | Anemia | 116 | 9 | Pelvic Inflammatory | 108 |
| 10 | Acute Respiratory Infection | 91 | 10 | Diabetes Mellitus | 94 |

Source : Fakfak Regency in Figure, 2011

According to the above table that communicable disease such as malaria persist as the highest number of disease in Fakfak Regency.

Other than communicable and incommunicable diseases, there is also HIV/AIDS patients in Fakfak Regency. The following data is HIV/AIDS prevalence during 2002-2011:

Table II-197 Data of HIV/AIDS Prevalence in Fakfak Regency in 2002- 2011

| Year | HIV | AIDS | Total |
|------|-----|------|-------|
| 2002 | 3 | - | 3 |
| 2003 | 2 | 2 | 4 |
| 2004 | 17 | 5 | 22 |
| 2005 | 4 | 3 | 7 |
| 2006 | 13 | 11 | 24 |
| 2007 | 41 | 8 | 49 |
| 2008 | 38 | 3 | 41 |

| Year | HIV | AIDS | Total |
|------|-----|------|-------|
| 2009 | 39 | 4 | 43 |
| 2010 | 202 | 100 | 302 |
| 2011 | 21 | 13 | 34 |

Source : The Health Department and AIDS National Commission of Fakfak Regency in 2012

Data on the above table indicates that HIV/AIDS in Fakfak Regency starting from 2002 tends to increase from year to year. The highest peak reached in 2010 and dropped in 2011.

Pulmonary TB cases also exists in Fakfak Regency. The spread of disease is found on each district as follows:

Table II-198 Total number of Pulmonary TB Patients in Fakfak Regency Recorded by District 2007- 2011

| District | 2007 | 2008 | 2009 | 2010 | 2011 |
|---------------|------------|------------|------------|------------|------------|
| Fakfak Barat | 17 | 20 | 11 | 13 | 6 |
| Fakfak Timur | - | 1 | - | - | - |
| Fakfak | 259 | 84 | 84 | 78 | 80 |
| Kokas | 23 | - | 14 | 9 | 10 |
| Karas | - | - | - | - | - |
| Fakfak Tengah | - | 87 | 33 | 83 | 50 |
| Kramamongga | 0 | 3 | 2 | 5 | 13 |
| Teluk Patipi | - | 11 | 4 | 9 | 5 |
| Bomberay | 5 | 2 | - | 4 | - |
| Total | 313 | 208 | 148 | 201 | 164 |

Source : Health Department and AIDS National Commission of Fakfak Regency in 2012

Data on the above table indicates that pulmonary TB highly affected community in Fakfak District, while none of pulmonary TB patients found in Karas District since 2007. In East Fakfak and Bomberay, there is no pulmonary TB cases existed since 2011.

a. Bomberay District

Two villages such Otoweri and Tomage villages, have different types of diseases. Three common diseases in Otoweri are namely high fever, headache and influenza, while in Tomage Village, there are headache, influenza, and sprain.

Table II-199 Type of Disease in Bomberay District in 2011

| No. | Type of Symtoms | Percentage | |
|-----|--|------------|--------|
| | | Otoweri | Tomage |
| 1 | High fever | 39.4 | 8.3 |
| 2 | Cough more than three weeks | 0 | 0 |
| 3 | Diarrhea | 0 | 8.3 |
| 4 | Headache | 27.3 | 29.2 |
| 5 | Helmintic infection | 0 | 0 |
| 6 | Itching | 6.1 | 0 |
| 7 | Seizure | 0 | 0 |
| 8 | Gonorrhea | 0 | 0 |
| 9 | Leucorhea / vaginal discharge | 0 | 0 |
| 10 | Influenza | 24.2 | 20.8 |
| 11 | Other symptoms (back pain, nausea and urinary) | 0 | 8,3 |
| 12 | Sprain | 0 | 16.7 |
| 13 | Toothache | 3 | 8.3 |

Source : Survey and Census by UGM, 2011

b. Kokas District

Based on the interview with midwife in Pustu Arguni and Taver, type of endemic disease is leprosy in Ugar, Darembang, Forir, and Fior Villages. While three diseases commonly suffered by the Kokas community, are namely malaria, influenza and diarrhea.



Figure II-235 Posyandu Cadres in Darembang Village, Kokas District

2.4.2 Access to Healthcare

2.4.2.1 Teluk Bintuni Regency

The development of health facilities in Teluk Bintuni Regency continues to improve from year to year since 2008. Even in 2011, a hospital was built in this region. The following table explains more about this information:

Table II-200 Health Service Facilities Teluk Bintuni Regency in 2008-2011

| Year | Hospital | Puskesmas | Posyandu | Clinic/Treatment Center | Polindes/Poskeskam |
|------|----------|-----------|----------|-------------------------|--------------------|
| 2008 | - | 12 | 81 | 2 | 6 |
| 2009 | - | 15 | 87 | 2 | 10 |
| 2010 | - | 15 | 90 | 2 | 14 |
| 2011 | 1 | 20 | 118 | 1 | 11 |

Source : Teluk Bintuni Regency in Figure, 2011

Based on the Minimum Standard Service analysis by Health Department, standard ratio between medical personnel and community in 2008 necessarily reached 100.000 people for each nine specialists, 30 general practitioners, 11 dentists, 158 nurses and 75 midwife, while for Puskesmas ratio is five Puskesmas per 100.000 people. By seeing on this fact, access to health facilities in Teluk Bintuni Regency is well supported since the number of available health facilities is more than the population number in this region.

Human resources in health sector has also sufficiently provided. For example, in RSUD Bintuni which had built since 2011 has provided four physician specialists, namely surgeon, obstetrician, internist, and pediatrician. Also there are 11 general practitioners and a dentist with Civil Servants (PNS) physician status, Temporary Employees (PTT) doctors from regional and national¹. The referrals process in transferring patients from health centers to RSUD Bintuni still faces obstacle due to the limited transportation facilities. Nevertheless, Health Department of Teluk Bintuni Regency has made efforts to overcome the obstacle such as offsetting the cost of fuel oil, delivery costs as well as additional costs for Puskesmas staff who deliver and rent longboat owned by community when patients from Puskesmas require referral activity. The number of means of transportation and medical personnels in Teluk Bintuni Regency are presented on **Table II-206** and **Table II-207** below:

¹ <http://www.up4b.go.id/index.php/prioritas-p4b/6-kesehatan/item/62-rs-teluk-bintuni-terbaik-yang-pernah-bambang-darmono-lihat>

Table II-201 Total Number of Transportation Means for Health Activities in Teluk Bintuni Regency 2008-2012

| Health Facilities | 2008 | 2009 | 2010 | 2011 | 2012 |
|---|------|------|------|------|------|
| Puskesmas Keliling (Mobile Puskesmas) using Double Gardan vehicle | 5 | 6 | 6 | 6 | 6 |
| Puskesmas Keliling Air (Water Mobile Puskesmas): | | | | | |
| - Speed Boat | 7 | 7 | 7 | 8 | 8 |
| - Longboat | 8 | 8 | 14 | 18 | 18 |
| Other vehicles : | | | | | |
| - Four Wheels | 4 | 6 | 9 | 9 | 12 |
| - Two Wheels | 35 | 35 | 42 | 47 | 50 |

Source : Health Department of Teluk Bintuni Regency, 2012

Table II-202 Total of Medical Personnel in Teluk Bintuni Regency in 2011

| No. | Type of Medical Personnel | Total |
|-----|---------------------------|-------|
| 1. | Physician Specialist | 0 |
| 2. | General Practitioner | 32 |
| 3. | Dentist | 6 |
| 4. | Nurse | 181 |
| 5. | Midwife | 70 |
| 6. | Pharmacist | 5 |
| 7. | Sanitarian | 4 |
| 8. | Nutritionist | 12 |
| 9. | Medical Technician | 13 |
| 10. | Community Health | 25 |

Source : Health Department of Teluk Bintuni Regency, 2012

a. Weriagar District

In 2011, Health Department of Teluk Bintuni Regency recorded that Weriagar District has a Puskesmas and Pustu, while medical personnels consist of a general practitioner and other seven medical personnels.



Figure II-236 Puskesmas Weriagar

b. Tomu District

Tomu District has four Posyandu, a Puskesmas and Pustu until 2010. For health staffs, Tomu District has two general practioners and 14 medical personnels (Health Department of Teluk Bintuni Regency, 2011).



Figure II-237 Puskesmas Aranday in Tomu District

c. Babo District

Based on data from Health Department of Teluk Bintuni Regency in 2011, number of existing health facilities in Babo District consist of four Posyandu

and a Puskesmas. These numbers are far different far from previous years. In 2006, this district has nine Posyandu, one Puskesmas and two Pustu.



Figure II-238 Posyandu Activity in Babo District

d. Aroba District

According to Health Department of Teluk Bintuni Regency in 2011, Aroba District has four Posyandu and three Pustu until 2010. Aroba District also does not have competent doctors or other appropriate medical personnel.

The nearest health facilities are located in Wimbro Village, which is about 2 km using a canoe or longboat. Data of ten common diseases have not been accessible to Pustu Sidomakmur. If there is illness complaint, Wimbro people often visit the health facilities.

e. Sumuri District

Health services in Sumuri District are adequately complete both medical personnel and health facilities. Data of Health Department of Teluk Bintuni Regency in 2011, Sumuri District has four units of Posyandu, two units of Puskesmas and two units of Pustu until 2010. Medical personnels are also available in this district such as doctors and other medical personnel. Sumuri District has two doctors with 18 medical personnels.



Figure II-239 Puskesmas Tanah Merah Baru

f. Kamundan District

Based on data from Regional Stakeholders Meeting in 2013, Kamundan District until 2012 has five Posyandu (Integrated Health Post) in each village and a Puskesmas. Kamundan District also has medical personnels consist of general practitioner, two midwives, five nurses, and a nutritionist.



Figure II-240 Puskesmas Kalitami

g. Aranday District

Table II-203 Total of Health Facilities by Villages in Aranday District in 2012

| No. | Village | Type of Health Facilities | | | | | | |
|--------------|-----------------|---------------------------|-----------|----------|--------|-----------|----------|----------|
| | | Hospital | Puskesmas | Pustu | Clinic | Poskesdes | Polindes | Posyandu |
| 1 | Aranday | - | - | 1 | - | - | - | 1 |
| 2 | Kecap | - | - | - | - | - | - | 1 |
| 3 | Manunggal Karya | - | - | - | - | - | - | 1 |
| 4 | Kampung Baru | - | - | - | - | - | - | 1 |
| Total | | | | 1 | | | | 4 |

Source : The Central Bureau of Statistics, Aranday District in Figure, 2013

2.4.2.2 Fakfak Regency

The development of health service facilities based on the ratio of health service facilities and total population in Fakfak Regency has shown excellent improvement. It is because Puskesmas are already provided in each district in Fakfak. Even all districts typically have more than one Pustu, except Central District of Fakfak that has only a Puskesmas and a Pustu. There is also a hospital in Fakfak District since 2004. Data of health service facilities which can be accessed by community in Fakfak Regency since 2004-2011 as follows:

Table II-204 Total of Health Service Facilities in Fakfak Regency by District in 2004 - 2011

| Year | Hospital | Puskesmas | Pustu | Treatment Center | Mobile Puskesmas | | |
|------|----------|-----------|-------|------------------|------------------|-----|-----------|
| | | | | | Boat | Car | Motorbike |
| 2004 | 1 | 8 | 38 | 2 | 12 | 5 | 11 |
| 2005 | 1 | 8 | 38 | 1 | 14 | 6 | 2 |
| 2006 | 1 | 9 | 35 | 2 | 7 | 7 | 11 |
| 2007 | 1 | 9 | 36 | 1 | 24 | 8 | 33 |
| 2008 | 1 | 9 | 36 | 2 | 7 | 8 | 13 |
| 2009 | 1 | 9 | 36 | 2 | 7 | 14 | 13 |
| 2010 | 1 | 9 | 35 | 4 | 9 | 14 | 28 |
| 2011 | 1 | 9 | 35 | 5 | 4 | 10 | 28 |

Source : Fakfak Regency in Figure 2011

Health human resources for in Fakfak Regency has also well provided if its ratio compared to the total population. The provision of medical personnels in Fakfak Regency since 2005-2011 as follows:

Table II-205 Total of Medical Personnel in Fakfak Regency by District in 2005 - 2011

| No. | Type of Medical Personnel | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 |
|-----|----------------------------------|------|------|------|------|------|------|------|
| 1 | Specialists | 4 | 3 | 3 | - | - | - | 2 |
| 2 | General Practitioner | 22 | 27 | 23 | 16 | 13 | 20 | 31 |
| 3 | Dentist | 2 | 3 | 4 | 7 | 5 | 6 | 7 |
| 4 | Nurse | 174 | 171 | 301 | 163 | 141 | 175 | 323 |
| 5 | Midwife | 75 | 90 | 108 | 67 | 79 | 67 | 92 |
| 6 | Other Paramedics | 30 | 61 | 81 | 11 | 18 | 32 | 65 |
| 7 | Non Paramedics | 48 | 44 | 71 | 22 | 14 | 12 | 25 |
| 8 | Pharmacist/ Pharmacist Assistant | 2 | 2 | 3 | - | - | 1 | 3 |
| 9 | Others | 7 | - | - | 10 | - | 8 | 7 |

Source : Fakfak Regency in Figure 2011

However, in general, health remains a serious problem in Fakfak, for example, quality of health service that still need to be enhanced in RSUD Fakfak. The accessibility and quality of primary health services based on the results of two Focus Group Discussions (FGD)¹ that performed in Fakfak described as follows:

Table II-206 Accessibility and Quality of Health Staff

| | Puskesmas | Pustu/Polindes | Posyandu |
|-----------------------------|---|--|-------------------------|
| Treatment Cost | Financed by Jamkesmas/Jamkesda (Health Insurance) or SKTM (Certificate of unable to afford) by Jamkesmas fund | Free | Free |
| Medicine Cost | Free through Jamkesmas or pay Rp 3.000,- | Check up at Pustu in working hours, unless subjected to pay various cost depend on the midwife | Free, Dues for Posyandu |
| Number of Doctors | Shortage, Frequently shortage due to working rotation of Temporary Doctors (PTT) | - | - |
| Number of Midwife | Available | Midwife are frequently absent or not in the clinic/medical center | - |
| Number of Nurse/Non-Medical | Shortage, particularly for dentist, pharmacist and nutritionist | - | - |
| Provision of Medicine | Shortage on vitamin and antalgyn. Stock difficulty | Limited, depend on Puskesmas | - |

¹ Final Report: Baseline Survey Revenue Sharing and Assesment Good Governance, Fakfak Regency, West Papua Province

| | Puskesmas | Pustu/Polindes | Posyandu |
|-----------------|---|--|---|
| | in 2010. | | |
| Consumables | Stock delayed / in low quality even expired | Depend on stock | |
| Equipments | <ul style="list-style-type: none"> • Having supported by good equipments but inability to use due to lack of instruction /operator • Able to examine malaria/HIV-AIDS • Scissors and etc, need to be renewed | Able to follow malaria standard check-up | Blood measure and weight scale equipment |
| Physical Access | <ul style="list-style-type: none"> • Steep and Hilly Topography • Most are not friendly used to vulnerable group | <ul style="list-style-type: none"> • Steep and Hilly Topography • Most are not friendly used to vulnerable group | Relatively accessible because selected from populated location |
| Daily Patients | people | 1-5 people | Depend on the number of toddler per year |
| Staff Skills | Lack of capable staff numbers on handling hospital inpatients | Partially unskilled and indicipline | Decline in number of cadre. Community demand cadre to be able to follow standard examination. |

Source : Final Report, Baseline Survey of Revenue Sharing and Assessment Good Governance, 2010

a. Bomberay District

Based on the data from Bomberay District in Figure 2011, health facilities are available in Otoweri and Tomage which are a Pustu for each. As for the medical personnel, particularly general practitioner and dentists are still not available in these two villages, only midwives and traditional midwife available there. More details is presented on the following table below:

Table II-207 Health Staff by Skills and Village

| No. | Village Name | Doctor | Midwife | Traditional Midwife |
|-----|--------------|--------|---------|---------------------|
| 1 | Otoweri | - | 1 | 1 |
| 2 | Tomage | - | 1 | 2 |

Source : Bomberay District in Figure, 2012



Figure II-241 Nutrition Center in Tomage Village, Bomberay District

Based on the information, there are many mothers in Bomberay District whose delivery were attended by traditional midwife since midwife only attend in Pustu Otoweri.

Table II-208 Health Facilities by Village

| No. | Village Name | Puskesmas | Pustu | Treatment Center |
|-----|--------------|-----------|-------|------------------|
| 1 | Otoweri | - | 1 | - |
| 2 | Tomage | - | 1 | - |

Source : Bomberay District in Figure, 2012

Meanwhile, provided facilities for mobile Puskesmas is only a motorbike in Puskesmas Otoweri.

b. Kokas District

Health services in Kokas District is centered on Puskesmas in Kampung Baru. Only few villages in Kokas District has health facilities. Based on the Central Bureau of Stastistics data in 2012, the total existing health facilities in the district is five units. The facilities consist of a Puskesmas located in the city and four Pustu in Mandoni, Forir, Darembang, and Matimber Villages. In addition to Puskesmas and Pustu, a mobile Puskesmas is also available in serving all of the village. Villages provided mobile Puskesmas, namely Kampung Baru has a boat, two cars, and four motorbike, as well as Goras Village which has a boat and motorbike.

Table II-209 Medical Personnel by Skill and Village

| No. | Village Name | Doctor | Nurse | Midwife | Traditional Midwife |
|-----|--------------------|--------|-------|---------|---------------------|
| 1 | Sekar | | 1 | | 1 |
| 2 | Kokas Kota | | 17 | 3 | 1 |
| 3 | Sisir | | | 1 | 1 |
| 4 | Kampung Baru | 2 | | | 3 |
| 5 | Ugar | | | 1 | 4 |
| 6 | Kinam | - | 1 | - | - |
| 7 | Andamata | - | - | - | - |
| 8 | Arguni | - | 1 | 1 | 1 |
| 9 | Fior | - | - | - | 4 |
| 10 | Forir | 1 | 1 | - | 2 |
| 11 | Darembang | 1 | 1 | - | - |
| 12 | Goras | - | 1 | - | - |
| 13 | Arguni Barat/Taver | - | 1 | - | - |

Source : Kokas District in Figure, 2012

Table II-210 Health Facilities by Village

| No. | Village Name | Puskesmas | Pustu | Treatment Center |
|-----|--------------------|-----------|-------|------------------|
| 1 | Sekar | - | - | - |
| 2 | Kokas Kota | - | - | - |
| 3 | Sisir | 1 | - | - |
| 4 | Kampung Baru | - | - | - |
| 5 | Ugar | - | - | - |
| 6 | Kinam | - | - | - |
| 7 | Andamata | - | - | - |
| 8 | Arguni | - | - | - |
| 9 | Fior | - | - | - |
| 10 | Forir | - | 1 | - |
| 11 | Darembang | - | - | - |
| 12 | Goras | - | 1 | - |
| 13 | Arguni Barat/Taver | - | - | - |

Source : Kokas District in Figure, 2012



Figure II-242 Puskesmas in Kokas Township

2.4.3 Environmental Health

2.4.3.1 Teluk Bintuni Regency

Environmental health depends on the availability of basic sanitation facilities which include clean water, family latrines, solid waste disposal, and means of management / disposal of liquid waste for each household. Yet, only data related to source of clean water for drinking water and family latrines can be obtained. The aforementioned data described as follows:

Table II-211 Drinking Water Source of Community in Teluk Bintuni Regency in 2008-2011

| No. | Year | Main Drink Water Source (%) | | | | | | | | | | Total |
|-----|------|-----------------------------|----------------|------------------|------------------|--------------------|-------------|-----------|-----------|---------------|-------|--------|
| | | Tap water | Protected well | Unprotected Well | Protected Spring | Unprotected Spring | River / Dam | Bore Well | Rainwater | Bottled Water | Other | |
| 1 | 2011 | - | 16.42 | 8.50 | 0.98 | 5.18 | 2.38 | 14.21 | 32.88 | 1.97 | 15.77 | 100.00 |
| 2 | 2010 | na | 22.37 | 18.24 | 0.40 | 0.95 | 1.76 | 5.76 | 25.51 | 2.08 | 22.93 | 100.00 |
| 3 | 2009 | 4.76 | | 5.84 | 6.49 | 0.86 | 4.35 | 5.19 | 37.34 | 8.92 | 0.86 | 100.00 |
| 4 | 2008 | - | | 10.31 | 0.76 | 8.78 | 0.74 | 6.91 | 42.11 | 0.39 | 26.94 | 100.00 |

Source : Fakfak Regency in Figure, 2011

The data in the table shows that the main source of drinking water in Teluk Bintuni Regency comes from rainwater, protected well and unprotected well. The number of residents who use rainwater, unprotected well and unprotected springs will allow

the high spread of gastrointestinal illness cases such as diarrhea, and also the possibility of disease due to deficiency of iodine element. The ownership of latrine facilities in Teluk Bintuni Regency as follows:

Table II-212 Percentage of Latrine Facilities by Ownership in 2008-2011

| No. | Year | Latrine Facilities | | | | Total |
|-----|------|--------------------|------------|--------|-------|--------|
| | | Private | Collective | Public | None | |
| 1 | 2011 | 60.49 | 16.53 | 10.90 | 12.09 | 100.00 |
| 2 | 2010 | 63.62 | 20.22 | 8.84 | 7.33 | 100.00 |
| 3 | 2009 | 77.87 | 7.40 | 5.62 | 9.10 | 100.00 |
| 4 | 2008 | 59.25 | 20.98 | 7.96 | 11.81 | 100.00 |

Source : National Social Economy Survey (Susenas) 2011

Based on the ownership, the latrine facilities in Teluk Bintuni Regency are classified well enough. As for the construction of latrines based on the type of latrine use, as follows:

Table II-213 Percentage of Household by Type of Latrine in Teluk Bintuni Regency in 2008-2011

| No. | Year | Type | | | |
|-----|------|------------------------------------|--------------------|---------------|--------------|
| | | <i>Leher Angsa</i> (goose neck) | <i>Plengsengan</i> | <i>Cubluk</i> | Not Occupied |
| 1 | 2011 | 55.38 | 18.23 | 24.02 | 2.38 |
| 2 | 2010 | 51.45 | 23.56 | 23.45 | 1.54 |
| 3 | 2009 | 43.06 | 24.78 | 31.69 | 0.47 |
| 4 | 2008 | 59.24 | 22.95 | 16.52 | 1.29 |

Source : National Social Economy Survey (Susenas) 2011

Since 2007 latrine construction for Teluk Bintuni community is adequately appropriate to environmental health requirements which is already using the *leher angsa* latrine. Hence, there are still pretty many households using *plesengan* and *cubluk* latrines.

a. Weriagar District

Village residents in Weriagar District are very dependent with rainwater as the main source of drinking water since they are located in swamp area. Although they are quite dependent on rainwater, there are still some people also using river water and mineral water as other source of drinking water.



Figure II-243 Clean Water in Weriagar District

Housing is located in areas exposed to tidal and river water cause almost all villages dispose of domestic waste by flowing it around house, except most of Mogotira Village where its large population dispose domestic waste into the pond/swamp.

Table II-214 Source of Clean Water and Waste Disposal in Weriagar District in 2011

| Characteristic | Village (%) | | | | | |
|---------------------------------|-------------|---------------|----------|----------|----------------|------------------|
| | Weriagar | Weriagar Baru | Tunaikin | Mogotira | Weriagar Utara | Weriagar Selatan |
| A. Source of Clean Water | | | | | | |
| Public Clean Water | 0 | 0 | 0 | 0 | 0 | 0 |
| Well Water | 0 | 0 | 0 | 0 | 0 | 0 |
| Rainwater | 78 | 63.6 | 66.7 | 83.1 | 50 | 47.6 |
| River Water | 19 | 31.8 | 33.3 | 13.9 | 50 | 47.6 |
| Mineral Water, River, etc | 3 | 4.5 | 0 | 3.1 | 0 | 4.8 |
| B. Waste Disposal | | | | | | |
| Gutter | 0 | 0 | 0 | 1.5 | 0 | 0 |
| Permanent Hole | 2 | 4.5 | 0 | 1.5 | 5 | 0 |
| River | 5 | 4.5 | 0 | 1.5 | 20 | 4.8 |
| Swamp | 29 | 40.9 | 25 | 52.3 | 30 | 42.9 |
| Flowing around house | 61 | 50 | 75 | 43.1 | 45 | 52.4 |
| Sea | 3 | 0 | 0 | 0 | 0 | 0 |

Source : Survey and Census by UGM, 2011

b. Tomu District

The village residents in the district are very dependent on rainwater as the main source of drinking water. It is because the geography condition of these villages which located at swamp and peat soil area. In addition to rainwater, other water sources such as mineral water and river water remains used, but only three villages that use alternative water sources namely Tomu, Sebyar Rejosari, and Wanagir Villages. Being in the area of tidal water, affecting the way of domestic waste disposal. People mostly dispose domestic waste by flowing it around house, while for community in Sorondauni Village entirely flowing the domestic waste to river.



Figure II-244 Type of Latrine in Taroy Village, Tomu District

Table II-215 Source of Clean Water and Waste Disposal in Tomu District in 2011

| Characteristics | Village (%) | | | | |
|-----------------------------|-------------|---------|------|------|-------|
| | Ekam | Totitra | Tomu | Adur | Taroy |
| A. Main Water Source | | | | | |
| Public Clean Water | 0 | 0 | 0 | 0 | 5.3 |
| Well Water | 0 | 0 | 0 | 0 | 3.5 |
| Rainwater | 97 | 100 | 95.6 | 100 | 91.2 |
| River Water | 0 | 0 | 2.9 | 0 | 0 |
| Mineral Water, River, etc | 3 | 0 | 1.5 | 0 | 0 |

| Characteristics | Village (%) | | | | |
|--------------------------|-------------|---------|------|------|-------|
| | Ekam | Totitra | Tomu | Adur | Taroy |
| B. Waste Disposal | | | | | |
| Gutter | 3 | 0 | 4.4 | 0 | 22.8 |
| Permanent Hole | 0 | 3.3 | 4.4 | 0 | 3.5 |
| River | 0 | 3.3 | 4.4 | 33.3 | 1.8 |
| Swamp | 42.4 | 43.3 | 30.9 | 0 | 3.5 |
| Flowing it around house | 54.5 | 50.0 | 55.9 | 66.7 | 68.4 |
| Sea | 0 | 0 | 0 | 0 | 0 |

Source : Survey and Census by UGM, 2011

Table II-216 Source of Clean Water and Waste Disposal in Tomu District in 2011

| Characteristics | Village (%) | | | | |
|-----------------------------|-------------|---------|------|------|-------|
| | Ekam | Totitra | Tomu | Adur | Taroy |
| A. Main Water Source | | | | | |
| Public Clean Water | 0 | 0 | 0 | 0 | 5.3 |
| Well Water | 0 | 0 | 0 | 0 | 3.5 |
| Rainwater | 97 | 100 | 95.6 | 100 | 91.2 |
| River Water | 0 | 0 | 2.9 | 0 | 0 |
| Mineral Water, River, etc | 3 | 0 | 1.5 | 0 | 0 |
| B. Waste Disposal | | | | | |
| Gutter | 3 | 0 | 4.4 | 0 | 22.8 |
| Permanent Hole | 0 | 3.3 | 4.4 | 0 | 3.5 |
| River | 0 | 3.3 | 4.4 | 33.3 | 1.8 |
| Swamp | 42.4 | 43.3 | 30.9 | 0 | 3.5 |
| Flowing it around house | 54.5 | 50.0 | 55.9 | 66.7 | 68.4 |
| Sea | 0 | 0 | 0 | 0 | 0 |

Sumber : Survey and Census by UGM, 2011

c. Babo District

For clean water source, community in Babo District use wells as the source of their drinking water. Although the villages of Babo District are located at water area, yet river water can not be consumed as water source. In addition to well water, people also use mineral water as their source of drinking water.

Table II-217 Source of Clean Water and Waste Disposal in Babo District in 2011

| Characteristics | Village (%) | | | | |
|-----------------------------|-------------|-------------|---------|--------|-------|
| | Modan | Irarutu III | Kanaisi | Kasira | Nusei |
| A. Main Water Source | | | | | |
| Public Clean Water | 0.6 | 0 | 0 | 0 | 0.7 |
| Well Water | 70.8 | 73.9 | 100 | 86.7 | 95.9 |
| Rainwater | 0 | 1.7 | 0 | 0 | 1.4 |
| River Water | 0 | 24.4 | 0 | 0 | 0 |

| Characteristics | Village (%) | | | | |
|---------------------------|-------------|-------------|---------|--------|-------|
| | Modan | Irarutu III | Kanaisi | Kasira | Nusei |
| Mineral Water, River, etc | 28.7 | 0 | 0 | 13.3 | 2.1 |
| B. Waste Disposal | | | | | |
| Gutter | 42.7 | 47.7 | 4.5 | 33.3 | 22.1 |
| Permanent Hole | 9.6 | 3.4 | 4.5 | 0 | 5.5 |
| River | 6.7 | 5.7 | 4.5 | 13.3 | 8.3 |
| Swamp | 3.4 | 8.5 | 18.2 | 0 | 13.8 |
| Flowing around house | 30.3 | 33.5 | 68.2 | 53.3 | 50.3 |
| Sea | 7.3 | 1.1 | 0 | 0 | 0 |

Source : Survey and Census by UGM, 2011

d. Aroba District

Most of 93.3% of clean water source of population is rainwater. Therefore, in drought season, residents often meet difficulties to their water needs. To overcome these problems, residents take rainwater from rainwater reservoir companies.

Most of the population in Aroba dispose domestic waste by flowing it around house. This is because the condition of houses built on the tidal area.

Table II-218 Source of Clean Water and Waste Disposal in Aroba District in 2011

| Characteristics | Wimbro Village (%) |
|-----------------------------|--------------------|
| A. Main Water Source | |
| Public Clean Water | 0 |
| Well Water | 3.3 |
| Rainwater | 93.3 |
| River Water | 0 |
| Mineral Water, River, etc | 3.3 |
| B. Waste Disposal | |
| Gutter | 0 |
| Permanent Hole | 0 |
| River | 10 |
| Swamp | 30 |
| Flowing around house | 53.3 |
| Sea | 6.7 |

Source : Survey and Census by UGM, 2011

e. Sumuri District

Water source used by residents in Sumuri District derived from various sources. The three main sources of drinking water i.e. rainwater, well water,

and collective water. Residents of the villages dispose domestic waste by flowing it around house, such as Tanah Merah Baru and Saengga Villages.

Table II-219 Source of Clean Water and Waste Disposal in Sumuri District in 2011

| Characteristics | Village (%) | | | | |
|-----------------------------|-------------|-----------|------------------|---------|-------|
| | Onar Lama | Onar Baru | Tanah Merah Baru | Saengga | Tofoi |
| A. Main Water Source | | | | | |
| Public Clean Water | 0 | 14.6 | 76.8 | 68 | 5 |
| Well Water | 3.7 | 39.6 | 11.2 | 19.4 | 22.6 |
| Rainwater | 92.6 | 45.8 | 10.4 | 12.6 | 60.2 |
| River Water | 3.7 | 0 | 0 | 0 | 0 |
| Mineral Water, River, etc | 0 | 0 | 1.6 | 0 | 12.2 |
| B. Waste Disposal | | | | | |
| Gutter | 44.4 | 37.5 | 38.4 | 10.7 | 28.7 |
| Permanent Hole | 18.5 | 10.4 | 34.4 | 63.1 | 9.7 |
| River | 11.1 | 4.2 | 4 | 13.6 | 12.2 |
| Swamp | 3.7 | 2.1 | 16.8 | 11.7 | 2.9 |
| Flowing around house | 22.2 | 43.8 | 6.4 | 1 | 46.6 |
| Sea | 0 | 2.1 | 0 | 0 | 0 |

Source : Survey and Census by UGM, 2011

Table II-220 Source of Clean Water and Waste Disposal in Sumuri District in 2011

| Characteristics | Village (%) | | |
|-----------------------------|--------------|---------------|--------|
| | Padang Agoda | Materabu Jaya | Furada |
| A. Main Water Source | | | |
| Public Clean Water | 19 | 0 | 0 |
| Well Water | 81 | 81.3 | 81.2 |
| Rainwater | 0 | 18.8 | 18.8 |
| River Water | 0 | 0 | 0 |
| Mineral Water, River, etc | 0 | 0 | 0 |
| B. Waste Disposal | | | |
| Gutter | 9.5 | 25 | 18.8 |
| Permanent Hole | 9.5 | 18.8 | 18.8 |
| River | 0 | 0 | 6.2 |
| Swamp | 4.8 | 12.5 | 0 |
| Flowing around house | 76.2 | 43.8 | 56.2 |
| Sea | 0 | 0 | 0 |

Source : Survey and Census by UGM, 2011

f. Kamundan District

Most of 93.3% of clean water source of the population is rainwater. Therefore, in drought season, residents often meet difficulties to the needs of water. To overcome these problems, residents take rainwater from rainwater reservoir companies.

Most of the population in Kamundan dispose domestic waste by flowing around house. This is because the condition of houses built on the tidal area.

2.4.3.2 Fakfak Regency

Environmental health data that can be obtained from Fakfak Regency in Figures 2011 are also only a data source of clean water and family latrines. Data source of public drinking water in Fakfak as follows:

Table II-221 Source of Clean Water of Community in Fakfak Tahun 2008-2010

| No. | Year | Main Source of Drink Water (%) | | | | | | | | | | Total |
|-----|------|--------------------------------|----------------|------------------|------------------|--------------------|-------------|-----------|-----------|---------------|-------|--------|
| | | Tap Water | Protected well | Unprotected Well | Protected Spring | Unprotected Spring | River / Dam | Bore Well | Rainwater | Mineral Water | Other | |
| 1 | 2010 | 44.21 | 0 | 0 | 1.58 | 9.49 | 0 | 0 | 38.25 | 5.97 | 0.50 | 100.00 |
| 2 | 2009 | 41.50 | na | na | 1.80 | 10.70 | na | na | 40.20 | 1.30 | 0.40 | 100.00 |
| 3 | 2008 | 58.05 | 6.85 | 0.68 | 7.84 | 14.67 | 0.34 | na | 10.89 | 0.34 | 0.34 | 100.00 |

Source : Fakfak Regency in Figure, 2011

Clean water sources in Fakfak Regency is good enough because mostly consume tap water. However, there are still many people use rainwater. The ownership of latrines facilities in Teluk Bintuni Regency as follows:

Table II-222 Percentage of Latrine Facilities by Ownership in 2007-2010

| No. | Year | Latrine Facilities | | | | Total |
|-----|------|--------------------|------------|--------|-------|--------|
| | | Private | Collective | Public | None | |
| 1 | 2010 | 64.74 | 10.92 | 11.47 | 12.87 | 100.00 |
| 2 | 2009 | 62.50 | 10.70 | 12.90 | 13.80 | 100.00 |
| 3 | 2008 | - | - | - | - | 100.00 |
| 4 | 2007 | 79.07 | 5.23 | na | 15.69 | 100.00 |

Source : Fakfak Regency in Figure, 2011

Based on the ownership, the latrine facilities in Fakfak region are classified in good condition. The construction of latrines based on the type of latrine as follows:

Table II-223 Percentage of Type of Latrine by Household in Fakfak Regency in 2007-2010

| No. | Year | Type | | | |
|-----|------|------------------------------------|--------------------|---------------|--------------|
| | | <i>Leher Angsa</i> (goose neck) | <i>Plengsengan</i> | <i>Cubluk</i> | Not Occupied |
| 1 | 2010 | 85.07 | 11.18 | 2.84 | 0.91 |
| 2 | 2009 | 85.50 | 10.40 | 3.10 | 1.00 |
| 3 | 2008 | 51.07 | 21.02 | 24.44 | 3.46 |
| 4 | 2007 | 60.58 | 28.25 | 2.63 | 8.53 |

Source : Fakfak Regency in Figure, 2011

Since 2007 more than half of its people are already using the *leher angsa* latrine, the latrine construction of Fakfak community can appropriately meet the environmental health requirements. Hence, there are still pretty much using *plengsengan* and *cubluk* latrines.

a. Bomberay District

Clean water source mostly used by residents in both villages in this district is rainwater. For Otoweri Village, population frequently use well water and mineral water besides rainwater as a source of drinking water. As for Tomage Village, river water also become a source of drinking water of population other than rainwater. For domestic waste disposal system, the residents in Otoweri mostly flow its waste around home, while Tomage by throwing waste into gutter.

Table II-224 Source of Clean Water and Waste Disposal in Bomberay District in 2011

| Characteristics | Village (%) | |
|-----------------------------|-------------|--------|
| | Otoweri | Tomage |
| A. Main Water Source | | |
| Public Water | 0 | 0 |
| Well Water | 1.9 | 0 |
| Rainwater | 96.3 | 84.6 |
| River Water | 0 | 15.4 |
| Mineral Water, River, etc | 1.9 | 0 |
| B. Waste Disposal | | |
| Gutter | 31.5 | 30.8 |
| Permanent Hole | 13 | 23.1 |
| River | 0 | 10.3 |
| Swamp | 1.9 | 7.7 |
| Flowing around house | 53.7 | 28.2 |
| Sea | 0 | 0 |

Source: Survey and Census by UGM, 2011

b. Kokas District

Based on the data from Central Bureau of Statistics of Kokas District in Figures 2012, housings have been already permanently built, i.e. 492 houses. It consists of 304 semi-permanent houses and the remaining 89 are not permanent houses

Main source of clean water in Kokas District comes from well water which can be found in Kokas City. However, only few residents have wells, so during drought season, residents who have wells are willing to share with neighbors due to water shortages. It can be seen in the Figure below, a man who are taking water from his neighbor's wells. Moreover, community in Kamundan District also make a public kitchen sewage around house.



Figure II-245 Well in Sisir Village, Kokas District



Figure II-246 A Man Taking Water in Sisir Village, Kokas District

2.5 OTHER ACTIVITIES AROUND THE PROPOSED LOCATION AND THEIR IMPACTS

2.5.1 Bintuni Bay Nature Reserve

The Bintuni Bay Nature Reserve is located approximately 80 km to the eastern of the Tangguh LNG Expansion Project site. In the 1980s, WWF has proposed an area of 450,000 Ha to be established a Bintuni Natural Reserve, but only 357,300 Ha was proceeded by the Agriculture Department. However, the area of 57,300 Ha was taken by PT BUMWI at the time to be used as production forest, hence the Minister of Agriculture only established an area of 300,000 Ha to be used as the Bintuni Nature Reserve through the Minister of Agriculture Decree No. 820/Kpts/UM/11/1982. In the 1990s, there was a review of the Bintuni Nature Reserve area due to concession interest in this area. Consequently, the Bintuni Nature Reserve area was reduced to be 124,850 Ha as stated in the Minister of Agriculture Decree No. 891/Kpts-II/1999 which it is still valid until today. Both regulations are interrelated in the establishment of Bintuni Bay Nature Reserve.

The importance of the ecological function of the Nature Reserve has been recognized internationally, and the Indonesian Government has proposed that this Nature Reserve to be declared as the Nature Reserve for Bintuni Bay during the “IUCN General Meeting” – the 18th global conservation meeting in Perth, Australia in 1990. However, as informed, the IUCN status for the Nature Reserve has not been established yet and there are no indication of further meeting regarding this proposal.

The Bintuni Bay is the largest protected bay bordered by tidal mudflats, sand and mangrove forest representing 11% of the total mangrove forest in Indonesia, and it is known as the largest mangrove forest in South East Asia. The mangrove forest is protected by the Nipah Palm zone with an area of 5 km² followed by freshwater swamp forest. The lowland tropical rain forest extends to the inland freshwater swamp zone.

The establishment history of Bintuni Bay Natural Reserve can be seen in **Figure II-265** below.

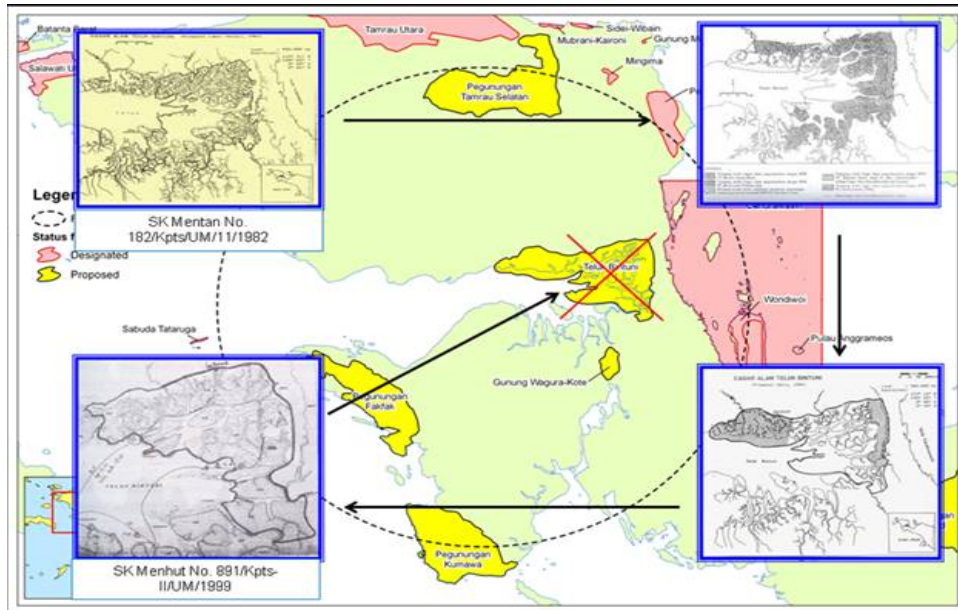


Figure II-265 The Establishment History of Bintuni Bay Natural Reserve

2.5.2 Oil and Gas Exploration

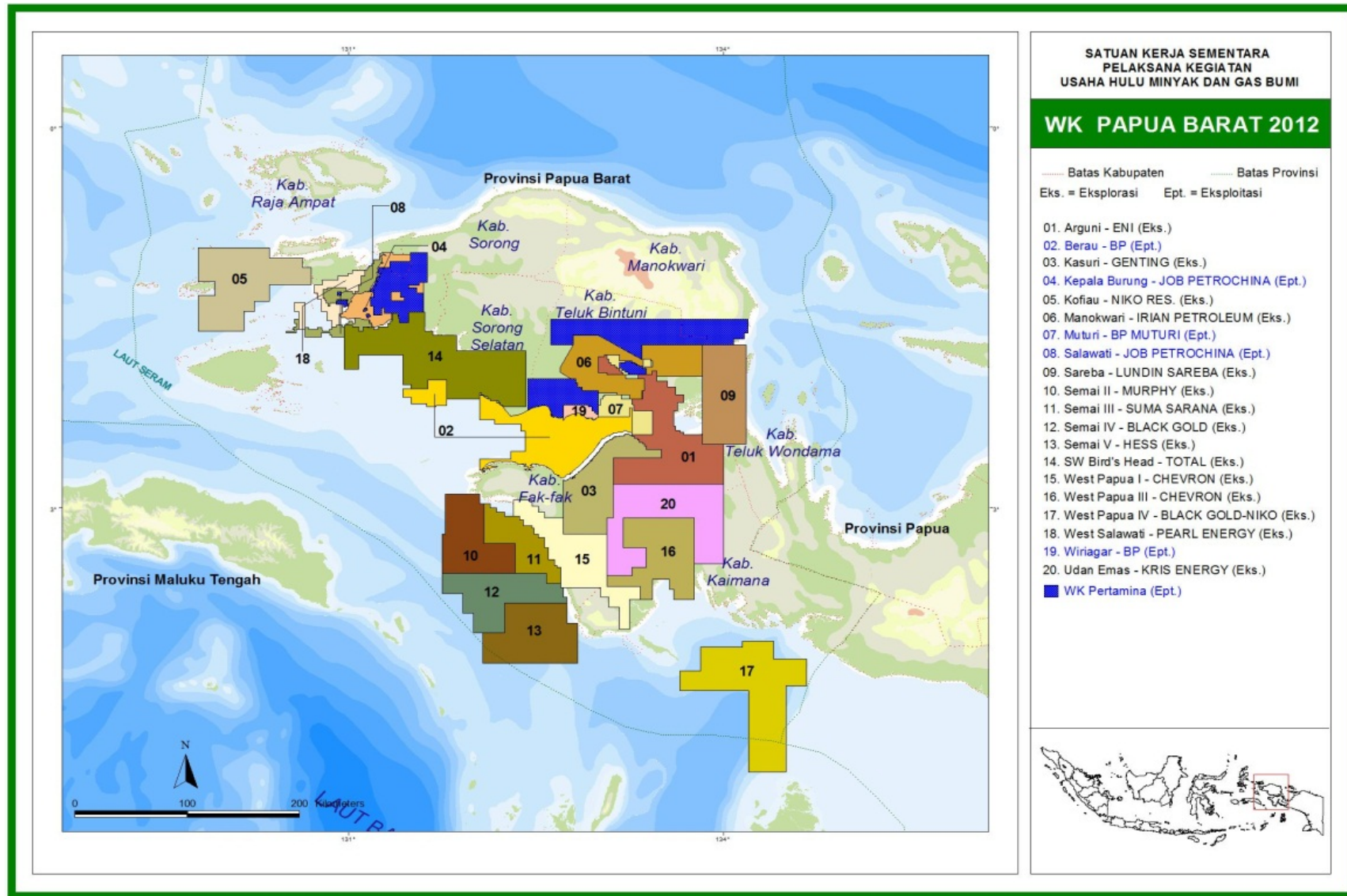
Along with the oil and gas exploration and operational activities of the Tangguh LNG, there are also other onshore and offshore exploration activities in the Bintuni Bay area operated by other PSCs as shown in **Map II-20**.

Referring to *Global Exploration & Production Service*, Map Title: Indonesia General, scale 1:4,000,000, June 2010, there are several PSCs areas in Bintuni Bay area operated by other oil and gas companies, such as Lundin and Irian Petroleum in the eastern of Bintuni Bay; Petroenergy Utama and JOB Pertamina-Kamundan Energy in the north shore of Bintuni Bay and Murphy in the western of Bintuni Bay.

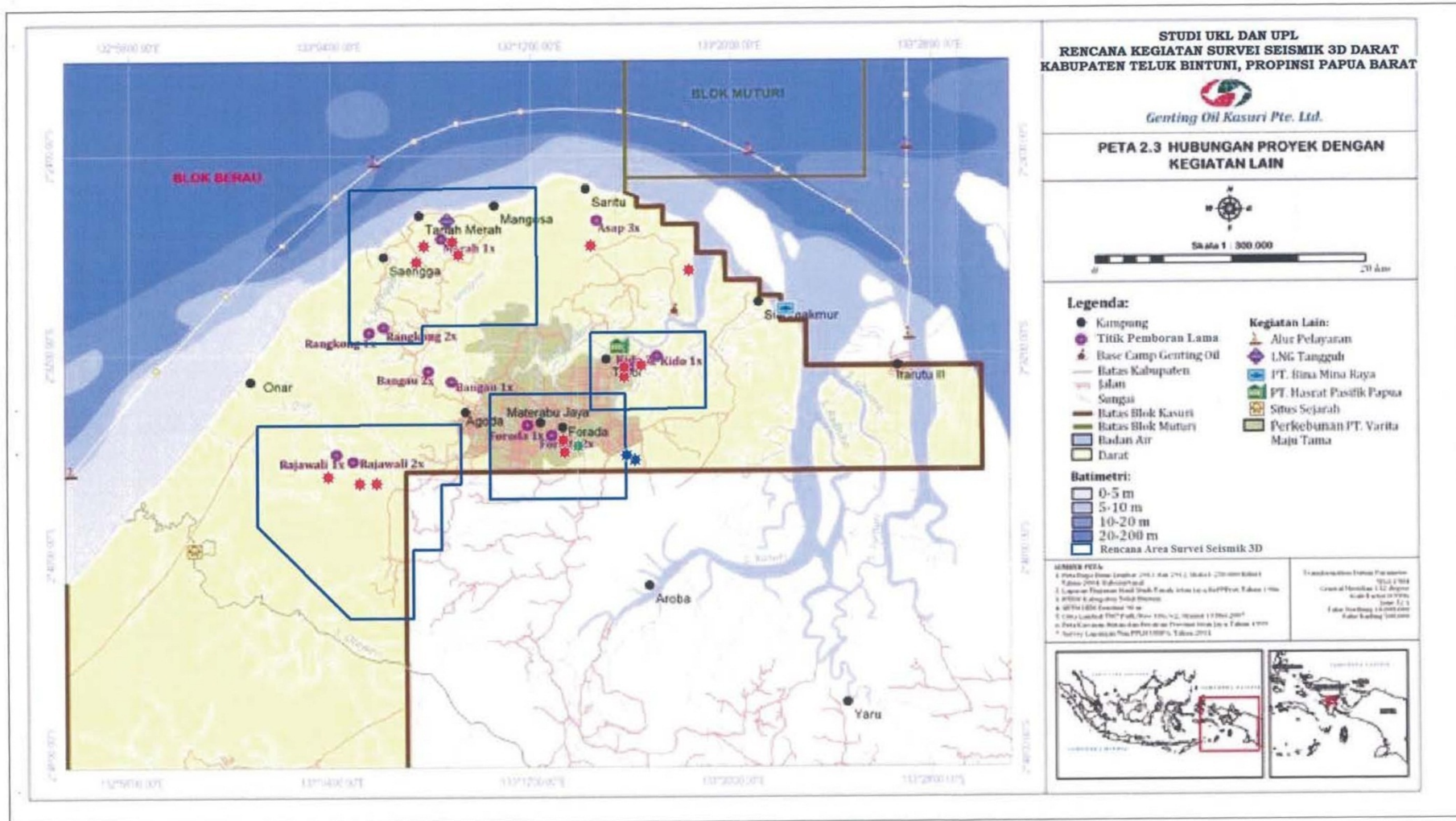
PT Genting Oil Kasuri Pte Ltd. is currently carrying out oil and gas exploration activities in the Kasuri Block, Teluk Bintuni Regency. According to the UKL/UPL document of Onshore 3D Seismic Survey Activities, Transition Zone and Waters in Berau Bay, Teluk Bintuni Regency, West Papua Province (as recommended in accordance with the Recommendation Letter of Bintuni Environmental Office No 660/58-IV/2013 dated April 5th, 2013), the proposed area of the onshore 3D seismic survey is 425 km², which part of the area about 140 km² is 'Red Zone' (*Area Merah*).

The 'Area Merah' partially overlaps the released forest area for the Tangguh LNG Expansion Project site (**Map II-20**). The activity is proposed to take place for about 14 months.

Exploration activities (including seismic) have potential environmental impacts such as air quality, noise, vibration, decrease in terrestrial vegetation population, and aquatic biota as well as social impacts such as disturbance of sea transportation, fishery activities, job opportunities, and business opportunities.



Map II-20 Other Oil and Gas Activities



Map II-21 Locations of the Proposed Onshore 3D Seismic Survey, Transition Zone and Waters in Berau Bay, Teluk Bintuni Regency, West Papua Province

2.5.3 Underwater Electrical Cables

As a part of the Electricity Distribution Network Development Project of Bintuni aiming to supply electricity from the Tangguh LNG site to State Electricity Company (PLN) to be further sold and distributed by PLN to the people in the north shore of Bintuni Bay, the PLN has installed PLN electrical cable networks from the Tangguh LNG plant to the north shore. The network covers onshore cables from the Tangguh LNG site towards Cape Tagopah, and the subsea cables network from Cape Tagopah crossing Kamarin in the north shore (**Figure II-266**). The PLN's subsea cable network is located in the eastern of the Tangguh expansion area, and buried at the seabed in accordance with the applicable regulations. Pipes and cables installation as part of the Tangguh LNG Expansion Project which will be laid on the area will potentially cause crossing with the PLN's subsea cables network. Thus, during the implementation of pipes and cables installation for the Tangguh LNG Expansion Project, coordination with related parties and further technical study will be required to ensure that the installation of Tangguh LNG's pipes and cables will not endanger the integrity of the PLN's subsea cables network.

Impacts that would arise due to the subsea electricity cables include increase in suspended solid concentration (TSS) in the seawater and decrease in plankton and benthos abundance, but these impacts are only temporary occurred during the installation of cables.

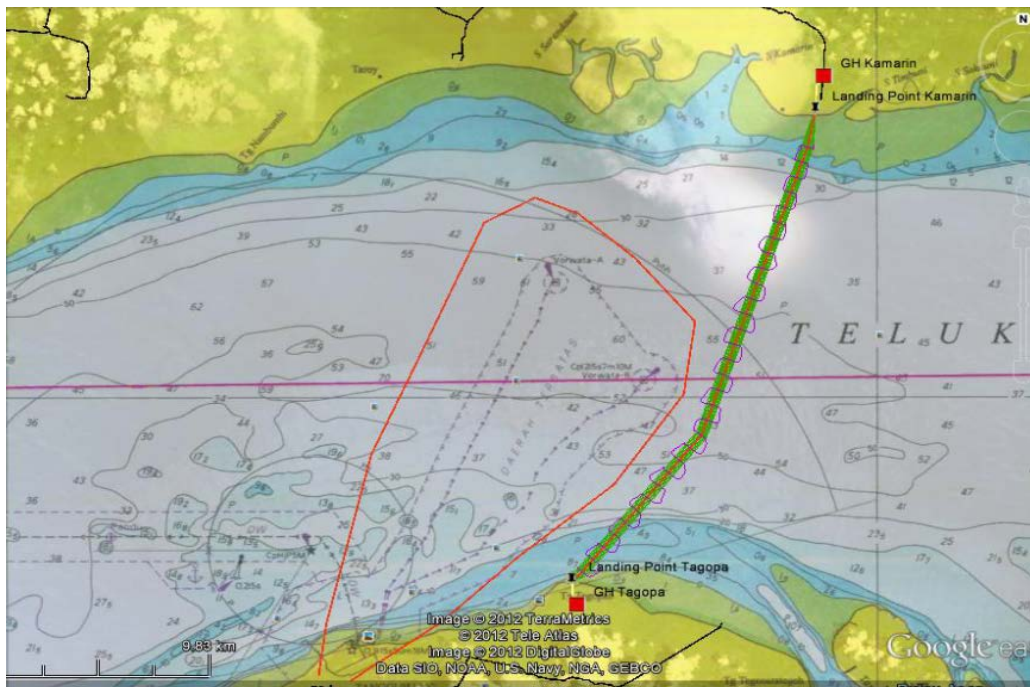


Figure II-266 Subsea Electricity Cables

2.5.4 Commercial and Small-Scale Logging

Commercial logging activities as well as the outcome from previous logging activities are obviously seen in this area. The evidence of selective land clearing and logging is obviously seen, particularly in the lowland rainforest area where there are large trees. Referring to the *Bintuni Bay Coastal Resources Atlas, 2003 (Atlas Sumberdaya Pesisir Kawasan Teluk Bintuni, 2003)*, there are 12 Concession Forest around Bintuni Bay:

- PT Agoda Rimba Irian;
- PT Arfak Indra;
- PT Artika Optima Inti Nusantara;
- PT Bintuni Utama MWI;
- PT Hanurata;
- PT Rimba Kayu Arthamas;
- PT Sagindo Sari Lestari;
- PT Teluk Bintuni Mina Agro Karya;
- PT Wapoga Mutiara Timber;
- PT Wukira Sari;
- PT Yotefa Sarana Timber; and
- PT Wana Irian Perkasa.

Small-scale logging is conducted by the local people in order to search for wood to build boats, buildings, bridges, and other structures. Logging is conducted selectively. The activity particularly affects lowland forest and onshore part of mangrove forest, which are close to residential areas.

The forest plays an extremely important role for the ecosystem. Logging activities, though commercial, will cause damage to the flora and fauna habitat if done excessively, consequently the flora and fauna could become endangered or even extinct. Forest logging would also potentially increase soil erosion.

2.5.5 Agricultural Activities

Sago plants grew in coastal plain swamps as well as at the swamp alluvial border, bigger rivers and their estuaries. Sago is much harvested by the local people. Other parts of the sago plant is used to build roofs and walls for houses, either permanent or temporary. In general, the utilization of resources appears to be at a sustainable level. A small number of livestock, particularly cows and goats, are bred by several local people. In general, agricultural activities are carried out traditionally to the extent that there is potential to reduce soil and surface water quality due to usage of chemicals such as fertilizers and pesticides that are quite small.

2.5.6 Fishery Activities

Catching fish and other sea products, particularly shrimp and crab, is frequently done in Bintuni and Berau Bay, with the use of various methods. Fishing appears to be concentrated in the near shore waters, in shallow waters near the coast. There are several fishery industries, which are currently operating in Wimbro and Sebyar Rejosari working together with the local community around this region.

Catching fish, shrimp and crab if done excessively will reduce the abundance of fish in the sea in Bintuni Bay.

2.5.7 Hunting Activities

A small number of hunters live in the hinterland of Bintuni Bay and Berau Bay. This community hunts wild animals, including wild boars, deer and birds. Birds including those that are protected species such as parrots and cockatoos are also caught and sold to bird traders. However, monitoring indicated that those species are still relatively common found in this region compared to other regions in Indonesia. Excessive continuous hunting activities would cause the animal species population to decrease, or even become endangered or extinct.