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## Effect of Community Migration and Remittance on Local Forest and Land Management in North Kalimantan, Indonesia

**Ndan Imang**

Lecturer, Department of Agriculture, Mulawarman University, Indonesia

**Martinus Nanang**

Lecturer, Department of Social and Political Science, Mulawarman University, Indonesia

**Rujehan**

Professor, Department of Forestry, Mulawarman University, Indonesia

### **Abstract:**

*This research was conducted in four forest-dependent villages of Kalimantan Indonesia which were traditionally migrated outside village even cross-country looking of job for decades. The purpose of this study is to determine the impact of migration and remittance to socio-cultural changes in forest management. From out-migration, return migrants contribute thoughts for the development of family businesses, agriculture and plantation. In-migration contributes to science and education of local community. Meanwhile, out-migration leads to a decrease in productivity to manage the land and increase non-arable land. Further in and out-remittances have an impact on the utilization of agricultural and forest products. Out-remittances are used to finance the education and usually made by utilizing agricultural and forest products. While in-remittances are used to meet daily households' needs.*

**Keywords:** Migration, remittance, social culture, local policy, Apau Kayan

### **1. Introduction**

The growth rate of migration from one place to another increases rapidly. Migration itself is a way of life, an investment and a strategy to defend against the changes that may occur. Further, Howell (2017) explains that migration is often viewed as the best option for poor rural households to exit out of poverty. People generally migrate from one place to other primarily for economic reasons to gain better living and improve their economic conditions. Migration has impacts on the economies that people leave and those in which they re-settle. These effects vary with different types of migration, the skills of the migrants and the lengths of time involved (Bandey and Rather, 2013; Stratan and Chistruga, 2012). Nevertheless, there are times when people migrate not only with economic motives, but also with non-economic motives, such as continuing education to increase their knowledge. Motives like this are usually driven by the open access to information from outside and increasing development in a region. Flahaux and de Haas (2016) states that infrastructure improvement and transportation, which usually accompany development, make travel less costly and risky, thus enabling migration over increasing distances. Those who take advantage of this opportunity are generally dominated by young people, while their parents are still working on agriculture fields. Such conditions will certainly have an impact on changes in community behavior related to the sustainability of forest and land management.

Forests can provide tangible and intangible benefits to local communities. However, these benefits can be achieved and maintained if there are people involved in managing forests properly and continuously. Poidelarjo (1997) in Widayanti and Widodo (1999) assumes that well managed forests by themselves will improve their function, both production function and protection function. But a good forest is not necessarily able to provide the immediate benefits needed for the people around it. Simon (1993) asserts that humans play an important role in the management of forest resources especially for agrarian communities because their lives depend more on the availability of arable land.

The preservation of forest functions as mentioned above will be disturbed if the community feels dissatisfied with what they have done. To achieve these expectations the choice to migrate becomes an alternative that may bring changes in their lives. Ellis (2003), Dharmawan (2006), de Haas (2008) explain that migration is a strategy undertaken by people everywhere to improve their livelihoods that often occur when their sources of income are more limited. In agrarian societies, migration is a strategy that they do to improve their lives and to some others is to survive when the land they depend on is increasingly limited (Mulyoutami et al. 2014). The choice of migrating out of the region will have a disproportionate impact on farmer households, where some family members living in the village should be responsible for land management activities. The division of labor between husbands, wives and grown-up children in migrating households also occurs, and often family members residing in the village have more responsibility for managing the land.

Remittances, like migration, affect the expenditure patterns of households. In addition, remittances shift household spending from less productive asset accumulation to more productive asset accumulation (Chiodi, Jaimovich and Montes-Rojas 2012 in Amuedo-Dorantes and Pozo 2014). For some households in research sites, remittances are one of their sources of income which they use for various purposes. Some of them receive remittances regularly in a certain

amount. But, for some others families, remittances can only be used when the migrated family members returned home or when they have accumulated a sufficient amount of money to transfer to their family. For farmer households, this uncertainty-income encourages them to seek alternative source of income such as utilization of forest products.

The above conditions provide clues to the change of social order in the villagers' society, thus affecting the behaviour of their lives. It is therefore important to assess the relevance of migration and remittance patterns to understand the dynamics that occur between forest villagers and local forest and land management. Thus, the purpose of this research is to know the dynamics of the social and economic and the environment as the impact of migration and remittances. The expected result of the research is that we could understand the implications of out-migrant and in-migrant to forest and land management for a sustainable forest management and economic improvement.

## 2. Study Site

The study was conducted from February 2017 to April 2017 in Malinau District of North Kalimantan Province, Indonesia. Malinau District is one of the regions resulted from the partition of Bulungan District based on Law Number 47 Year 1999 with an area of 39,799 square kilo meters. Astronomically, Malinau District is located between 114° 35' to 116° 50' East Longitude and 1°21' to 4°10' North Latitude. Malinau District is directly adjacent to neighborhood country Malaysia. So that Malinau District has a strategic position for traditional cross-boundary or migration from Indonesia to Sarawak Malaysia.

Since 2006, Malinau District has 12 Sub-Districts (*Kecamatan*) with 108 villages (*Desa*), including 4 villages for research sites, namely; Kaliamok, Setulang, Long Loreh and Tanjung Nanga. The reason to select the villages for research because there is an on-ground project of Forests and Climate Change Program (FORCLIME) which currently operating in the villages with the objective that community may benefit from the projects. This study will help to find strategy how to improve the effectiveness of sustainable forest management promotions and the livelihoods of communities in their work areas. Access from the District Capital of Malinau to research sites is ground transportation/road with distance to the nearest village in Kaliamok about 5 km, and the farthest village in Tanjung Nanga is about 70 km. The geographical position of the villages is presented in Figure 1.



Figure 1: Study Site Map

## 3. Data Collection

Data collection consists of primary and secondary data. Secondary data were collected through a review of reports and related documents. The primary data were collected through three mutually supportive means, they are:

- Focus Group Discussion (FGD). Numbers of FGD participants in each village were 20 people consisting of 10 men and 10 women. They were the representatives of community groups and women who are considered to have extensive knowledge about the migration and management and utilization of forest in the village. Participants were formed in two groups of men and women for balanced information and women can speak freely.
- In-depth interview. Respondents of in-depth interview were Government officials such as head of Sub-district (*Camat*), village leader (*Kepala Desa*), community leaders (*tokoh masyarakat*). They were considered to have extensive knowledge of migration, knowledge of forests and source of livelihoods as well as village government, and people who have migrated or have worked in other countries. A set of questions used to gather information, especially data and information related to labor force, migration, forest and land uses by society.
- Household survey of migrants. Respondents were all (100%) of households at each village in which one or more of the family members are migrants. They were considered representative to study the issue of migrant worker in all surveyed village. A set of structured questions used for data collection. In this research, we define *in-migrant* as those who come to work and live in the village for at least 5 years, and *out-migrant* are those who left the village to work outside village both in Indonesia and other countries. The number of *in-migrant* and *out-migrant* in each village is shown on Table 1 below.

Village	Number of Household	Number of in-Migrant (person)	Number of out-Migrant (person)
Kalamok	180	7	10
Setulang	185	7	19
Long Loreh	365	5	16
Tanjung Nanga	189	6	16
Total	919	25	61

Table 1: Number of Population and Respondent by Village

## 4. Result and Discussion

### 4.1. Condition of Migration

Migration in this study, in local dialect so called *meselai* or *peselai* is an activity when a group, usually 10-40 men leave their village to look for job in other region or even in other countries. They usually spend more than one year to work outside village before return home. Few would dispute that migration can be a rational response to poverty and limited life opportunities. More educated (relative to their peers) and younger individuals migrate (King *et al.* 2013, Hirvonen and Lilleør, 2015). In the observed villages, migration has always been common, both out-migration, and in-migration. From all the villages where the study was conducted, it was found out that out migration, especially migration to find employment in Malaysia, was prevalent before the reforms. This means that until the late of 1990s and early 2000s such migrations still occur in the villages that located along the border of Malinau Region and Sarawak Malaysia. The majority of Kalamok villagers are ethnic of Lundayeh who migrated from upper Mentarang Hulu District. The first migration occurred in 1958. The reason for the migration was due to isolation of accessibility. By the time the Lundayeh were still in Mentarang (until the 1960s), many of them went to work in Malaysia. Many of those who went to Malaysia decided not return to Indonesia, so that they formed the village of Lundayeh ethnic. The reason they moved was due to economic crisis and scarcity in their original village in Mentarang. In Malaysia State, they worked at logging and rubber or oil palm plantation companies and earned enough money for daily life and even for saving.

Migration in Long Loreh Village also occurred a lot before decentralization of 1999. The Long Loreh Kenyah people moved from Long Lat and Long Liu in 1971. The reasons for the migration were also due to isolation of areas that hindering access to health and education services, as well as employment. Even though they already have moved to Long Loreh there are still some people looking for jobs in neighbor country Malaysia. When they returned home, they brought various new knowledge and technology such as chainsaws which has multi-function for example making housing materials, cutting big trees for field and many other functions.

The same thing happened in Setulang village. People migrated to neighbor country Malaysia to find job, mostly manual works at logging company or oil palm Company or any available job without specific condition. Since 1990s some of skilful people who ever worked in Sarawak Malaysia were sent to work in Guyana and Brazil as operator of chainsaw and tractor with a good salary. During the FGD in Tanjung Nanga Village, we collected information that there were some residents who were looking for jobs in Malaysia. Some of them decided to live in Malaysia for decades and not return to Tanjung Nanga Village again. The migration to Malaysia also still exists which according to FGD participants consisted of women as well. Sultana and Fatima (2017) explain that un-employment and low wages prevailing in the domestic market pushes female workers to look for better employment abroad. The people who were looking for jobs in Malaysia were mostly unskilled migrant labors. The number of in-migration and out-migration in the last 5 years is shown on Table 2 below:

Village	Out-migration	In-migration
Kalamok	<ul style="list-style-type: none"> <li>10 persons (mostly working at private company in Sarawak Malaysia)</li> <li>49 persons (study at University in other towns and get jobs as civil servants, employee)</li> </ul>	<ul style="list-style-type: none"> <li>7 persons (got married with local people, teacher, running small store)</li> </ul>
Loreh	<ul style="list-style-type: none"> <li>16 persons (working at private companies in other District/Provinces or Sarawak Malaysia, Latin America, and Papua New Guinea)</li> <li>36 persons (studying at Universities in other towns and even other islands, got job as Civil Servant and employee).</li> </ul>	<ul style="list-style-type: none"> <li>5 persons (running business/ services, teacher, nurses,</li> </ul>
Setulang	<ul style="list-style-type: none"> <li>19 persons (working as Civil Servant in towns, employee at private companies in Sarawak Malaysia and Indonesia)</li> <li>28 persons (studying at Universities in towns and even in other islands)</li> </ul>	<ul style="list-style-type: none"> <li>7 persons (teacher, religious leader, running services)</li> </ul>
Tanjung Nanga	<ul style="list-style-type: none"> <li>16 persons (working at private companies in Sarawak Malaysia, and Civil Servant in towns and even in Java/Sulawesi islands, married in towns)</li> <li>22 persons (studying at universities in towns and in Java Island)</li> </ul>	<ul style="list-style-type: none"> <li>6 persons (teacher, religious leader, married)</li> </ul>

Table 2: Number of Out-Migration and In-Migration

Source: Focus Group Discussion (FGD) In 2016

#### 4.2. Effect of Migration and Remittance

Economists have analyzed migrants' behavior and in particular their motivations to send remittances. Migrant altruism towards the family left behind is among the most widely acknowledged motives for remittances. Practically all other motives can be related to the existence of some implicit contract between the migrant and the recipient. Households' decision to migrate can be explained in a cost-benefit framework; the costs incurred by the household include travel and search costs as a household member seeks employment in another community or country and the costs of lost home production contributed by the migrating member. The benefits primarily come in the form of increased income as remittances are returned to the household. Migration occurs if the benefits outweigh the costs (Delpierre and Verheyden 2014, Bansak *et al.* 2015).

The impact of migration and remittance is seen in the perspective of its impact on the village and household's income as well as on the management of land and forests. Both impact of out-migration and in-migration as well as remittances impacts are discussed below.

#### 4.3. Effect of Migration

In addition to money, migration also entails the circulation of ideas, practices, skills, identities, and social capital also circulate between sending and receiving communities. Technology flows back to source countries when migrants return; for example, they provide evidence that highly skilled migrants increasingly migrate temporarily and, therefore, bring back with them the knowledge they acquire abroad (Lacroix *et al.* 2016, Mayr and Peri 2008 in Douglas 2015).

##### 4.3.1. Out-Migration

Migration may have profound effects on the size, structure and growth patterns of populations. These effects may vary in time; also, for example depending on the gender of migrants, in the long run it can affect population growth rates (Stratan and Chistruga, 2012). In terms of household migration in four research sites, we described some effects as follows: First, out-migration of the village affected the population and the number of family members in the village. The population and the number of family members in the village were reduced.

Second, out-migration affected the agriculture production of the village. Rural labor out-migration led to a decline in agricultural cultivation and production. Rural households with labor migrants were found to have lower agricultural productivity than those without migratory workers. In this case, family labor working in agricultural field and plantation was reduced because of the out-migration. This fact is in-line with (Mazambani 1990; Rozelle *et al.* 1999; Schmook and Radel 2008 in Qin 2010).

In order to cover labor needs, a household hired available local labor in the village. Thus, there was a diversion of jobs working on agricultural fields and plantations from household members to hired labor. At that time, local labor was still relatively sufficient. But overall, the local workforce in households has been perceived to start somewhat reduced in number compared with 5 years ago. This is due to the fact that those who migrate out of the village for study at university, after graduation and return to the village, most of them less interested to do traditional jobs like paddy fields, farming or gardening. They more interested to do non-traditional agricultural work (shifting cultivation) such as to run small business, to be a contractual-based teacher, a job at Village Office or contractual officer at Sub-District Office.

The impact of out-migration on the utilization and management of land and secondary forests (*jekau* or *jakau*) in general was reduced labor working on fields or plantations and arable land. With the reduced size of cultivated agricultural land, especially for the fields, the extent of farmland owned by households being consumed increases. Thus, the cover of scrubland and unused cultivated secondary forest land was widespread. Secondary forests other than as reserves for agricultural land, were also used by households as a place to pick up firewood, hunting grounds, and forest vegetables. Out-migration did not seem to affect much of the utilization and management of primary forests (*mpa'* or *empa'*). The use of primary forest by the community in general was a place to hunt, to collect non-timber forest products, wood building materials, fruits, vegetables and honey.

Regarding the impact of out-migration, there was a special note about Kaliamok Village in Malinau. In the last 5 (five) years, out-migration to work outside the village has decreased in number. This was because the available job in the village was quite large due to easier access for markets, including market for agricultural products. Local community then open more agricultural fields, not only in the bushes and secondary forests of former agricultural fields that they had previously cleared, but also the primary forest or virgin forests have been plotted and converted into oil palm, rubber, dragon fruit, and pepper.

The out-migration also had an impact on the dissemination of knowledge, information and technological advances to the village. From out-migration, some have completed their education at the diploma level as well as undergraduate level. Among those who return to the village, they contributed to the development of the village. A graduated of Accounting Diploma who return to the village contributed his thoughts to the development of his parents' business, in particular the effort to improve their bookkeeping system. From out-migration in order to earn livings outside the village, moreover abroad, there were some migrants who carry information about certain methods or ways of business, agriculture and plantations should practice at their village. When they returned to the village, they proposed their thoughts and knowledge to their family and villagers and taught the methods so that agricultural fields and plantations in the village can be more advanced.

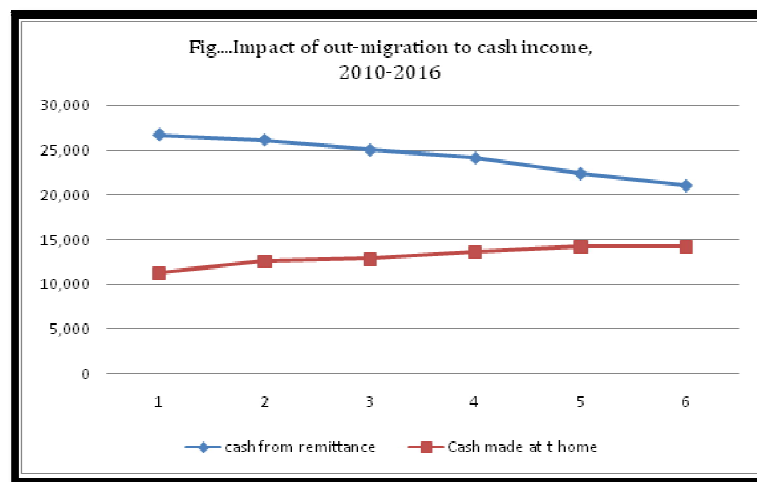


Figure 2: Impact of Migration to Cash-Income 2010-2016

#### 4.3.2. In-Migration

In the last five years, migration into villages in four research sites occurred largely due to migrants' assignments or jobs in the village as teachers, nurses, employees of government agencies or companies. There were some people on their own initiative open a business and change their domicile. In addition, there was also migration due to marriage, to follow their husband or wife, and or join a long-lived family in the village. Some of them are those who returned to their homes after long periods of stay in other areas, such as those who have been living in Sabah or Sarawak Malaysia.

Migration in four villages in Malinau caused increases in population and the number of family members in the village, although the numbers were not too large. Their presence also increases the number of workers in the village and in the household. Those who migrate to the village due to marriage, follow their spouses, and or join families who have long lived in the village and who return to the hometown after long periods of residence in other areas, live with their families in the village and working in the rice fields and plantations. However, they did not open or have their own fields and plantations. Meanwhile, people who migrate to the village because of their jobs in the village as teachers, nurses, employees of government agencies or companies and those who open their own businesses in the village, usually only planted vegetables for their own needs. Thus, migration into villages had little impact on the use and management of land and forest.

Like out-migration, in-migration also affects the dissemination of knowledge, information and technological advances to the village. From the in-migration, the teachers in schools contributed to the scientific knowledge of students, as well as educational information to their parents. There was also empowerment of those who working in the village office as operators. Some people such as traders and stall-food entrepreneurs, fuel-base enterprises, and street vendors often inform the villagers about their business activities and inspired them to try other business alternatives beyond traditional agricultural activities, plantations and exploitation of forest products.

#### 4.4. Effect of Remittances

Lucas and Stark (1985) point out the complexity of family arrangements involving migration. Migrants transfer because they are concerned about the consumption of their families. The purpose of these migrants is to improve the welfare of their families and loved ones by incorporating the utility of these people in their own utility (Lucas and Stark 1985; Cox et al. 1996; Rapoport and Docquier 2005 in Bouoiyour and Miftah 2015). Migrants in the field sites mentioned the same thing that they went to work in Sarawak Malaysia or other countries to make much money and to buy chainsaw. A chainsaw (Stihl-36) is considered as investment because they could make more money using the chainsaw after the returned home.

##### 4.4.1. Out-Remittance

Migration and remittances are expected to change the bargaining power within the family which may affect the allocation of household expenditures (Göbel, 2013). Out-remittances were made to finance the education of family members who are living outside the village. This remittance was regular in a certain amount, which inevitably must be met by the family. The need for this money was met by various sources of income. For the 4 villages in Malinau, households' income sources are as presented on table below.

Village	Source and total amount of households' income (in Rp/month)				
	Agriculture Product	Labor Wage	Employee Salary	Business Profit	Forest Product
Kalamok	1,730,530	1,260,470	1,460,510	876,400	543,980
Long Loreh	1,643,005	910,200	1,500,600	987,000	654,300
Setulang	2,150,403	564,210	1,558,700	902,305	823,500
Tanjung Nanga	2,016,500	856,210	1,754,330	875,432	659,200
Average Total	1,885,109	897,772	1,568,535	910,284	670,245

Table 3: Source and Total Amount of Households' Income in the 4 (Four) Sample Villages

Note: \$ 1 = Rp. 13,200

Source: Focus Group Discussion (FGD) in 2016

Table 3 above indicates the difference in the total number of each source and amount of households' income in the four villages. Agricultural products play the most important contribution to household income. If all the source and amount of income were ranked, it could be seen in Table 3 below.

Village	Source of Income				
	Agriculture Products	Labor Wage	Employee Salary	Business Profits	Forest Products
Kalamok	1	3	2	4	5
Long Loreh	1	4	2	3	5
Setulang	1	5	2	3	4
Tanjung Nanga	1	4	2	3	5

Table 4: Rank of Households' Source of Income in the 4 (Four) Sample Villages

Note: 1,2,3,4,5 Is The Rank Of Households' Source Of Income Based On The Total Amount Earned

Table 4 above shows that agricultural products are the first household source of income in four villages of research site. Thus, the fulfilment of remittance in order to finance the education of family members who went outside the village came mostly from the utilization of agricultural products. Due to the easier access to agricultural products market, households attempted to support their income from agriculture, especially from plantations. The types of plants grown in the plantations are as shown in Table 5 below.

Village	Type of Plants						
	Coffee	Cacao	Rubber	Palm	Fruits	Eagle-wood	Vegetables
Kalamok	3	1	2	4	3	4	NA
Long Loreh	4	1	2	3	6	5	6
Setulang	3	3	2	4	4	NA	1
Tanjung Nanga	4	3	1	NA	2	NA	4

Table 5: Rank of Households' Plants Type in Each Village

Source: Field Survey (2016)

Note: 1, 2, 3,4,5,6 Is The Rank of Plantation Products Based on the Amount Planted by Households  
NA: Not Available

Household income from agricultural products, labor wage, employee salary and business profits are time-bound incomes, meaning that it can't be obtain every time. Therefore, if the family at any time requires money, including to pay the education of family members who went for study outside the village, then the most flexible alternative source of income is to seek forest products. This can be seen from the variations in the use of forest products by various households in 4 (four) villages in Malinau as presented in Table 6 As argued by McElwee (2010) in Garekae *et al.* (2017), some people depend solely on forests as their only source of subsistence, with its contribution sometimes being found to offset other household livelihood portfolios such as agriculture.

Village	Type of forest products and the total income earned (in Rp/month)						
	Fire Woods	Wood Building Materials	Ntfps	Hunting Fishing	Fruits	Vegetables	Honey
Kalamok	521,300	380,540	298,201	414,290	399,203	286,400	51,000
Long Loreh	570,230	300,650	297,500	312,100	281,100	287,000	45,210
Setulang	465,206	454,290	632,011	455,320	212,300	321,090	35,000
Tanjung Nanga	496,510	209,320	398,200	412,000	210,010	167,400	67,200
Average Total	513,311	336,200	406,478	398,427	275,653	265,472	49,602

Table 6: Total Income Earned From Each Type of Forest Products

Source: Field Survey (2016)

Note: \$ 1 = Rp. 13,200

Table 6 points out the difference in the total income earned from each type of forest products used by households. Table 7 ranks the forest products utilization in each four sample villages from the most to the least utilize product.

Village	Forest products utilization						
	Fire Woods	Wood Building Materials	Ntfps	Hunts and Fish	Fruits	Vegetables	Honey
Kalamok	1	4	5	2	3	6	7
Long Loreh	1	3	4	2	6	5	7
Setulang	2	4	1	3	6	5	7
Tanjung Nanga	1	5	3	2	4	6	7

Table 7: Rank of Forest Products Utilization in Each Village

Note: 1,2,3,4,5,6,7 Is the Rank of Forest Products Utilization Based on the Total Income Earned From Each Type of Forest Products.

In Table 7 it is seen that fire woods, hunts and fish, and NTFPs are mostly used by local community in the four villages. Thus, the impact of out-remittance was the intensification of firewoods, hunting and fishing and NTFPs harvesting on forest area. In line, Midoko Iponga *et al.* (2016) stated that NTFPs are often presented as a major contributor to livelihoods, as sources of food and cash, particularly for rural communities.

Forest areas in four villages in Malinau generally consist of: 1) old secondary forest, former family estate or plantation; 2) primary forest that is managed and utilized communally by all local villagers. Some of these primary forests are designated as public forest that can be used daily for any kind of harvesting by all villagers in need, and some are designated as *Tana 'Ulen*, which is used in a limited way (there are certain forest products that can be taken daily by villagers from *Tana 'Ulen*, and or any other forest products that can only be taken by villagers at certain times only). Among the four villages in Malinau, only in Kalamok Village does not have *Tana 'Ulen* (*customary protected forest*). In this village, there is only a common forest area, some of which have been plotted for agricultural land and family plantation by local villagers. While in Tanjung Nanga Village there is *Tana 'Ulen*, but the public forest area has been plotted for reserves of agricultural land and plantation by local villagers, such as in Kalamok Village.

#### 4.4.2. In-Remittance

Remittances by migrants are an important component of household income. The income levels of family members are often maintained by migrant remittances which serve to maximize the utility of the nuclear family as a group (Knowles and Anker 1981; Mukras *et al.* 1985 in Jena 2016). In this research, the family members who migrate for work, as described above, usually send some of their money to their families in the village. Due to no electronic banking at that time, the migrants usually as a friend who return home to take the money to family at home. Some of the remittances were used by families to meet their daily needs and pay the wages of labor hired to do field work or other work that requires special skills, as well as medical expenses, tuition fees for children (boarding school, meal allowance, and tuition fees), home improvement, for savings and venture capital and for social needs, such as Christmas celebrations. In such case, the existence of remittances may, in part, reduce pressure on the utilization of agricultural and forest products as sources of income.

## 5. Conclusion

From the foregoing explanation some general conclusions can be drawn about the conditions and linkages of migration and remittances and their effects on livelihoods, incomes, and the utilization and management of forest resources in Malinau.

Prior to the 2000s, out-migration to work and earn livings outside the village, mainly to Sarawak and Sabah were still numerous, as the work and businesses in the village for cash income were almost not existent. Out-migration to work in Sarawak and Sabah (*Peselai* or *Meselai*) was done in large groups, because travel and transportation require the cooperation of many people. After the 2000s with the existence of regional autonomy and broaden central government or sub-district to the hinterland, there were many job and business opportunities in the village, so the number of out-migration to work and earn livings outside the village was reduced. In addition, with the opening of inter-regional ground transport routes to the border areas of Malaysia (Sarawak and Sabah), out-migration to Sarawak and Sabah was no longer conducted in large groups, but individually or only with a small group of 2-3 people only.

In the last five years, the largest number of out-migration was those who migrated outside the village to attend school mostly at Universities. The number of men and women attending education was more or less equal, while temporarily out-migration to earn livings were mostly consist of men, but now there are not many of them. This condition was due to larger job and business opportunities. So, villagers who moved out of the village and settled elsewhere were very rare. Furthermore, the largest number of in-migration of the village were those who moved permanently in the village because of the duty or service in the village, followed by marriage with the local villagers, and lastly for earning a living like running a business or trading. Overall, the number of out-migrations was far more than the number of in-migrations.

Out-migration generally reduced workforce in the village. In order to meet the needs of labor, villagers used available local workforce. Therefore, the size of cultivated agricultural land and plantations in general got smaller. In terms of re-vegetation, under-brushes fields and secondary forest (*jekau* or *jakau*) were widespread and the cover of scrubland

and secondary forest also grew thicker. Both out-migration and in-migration of villages had an impact on the dissemination of knowledge, information and technological advances to the village. From out-migration, when they return to village, they contributed thoughts for the development of family businesses and village development. Others bring information about certain methods or ways of business, agriculture and plantation. Meanwhile, in-migration contributed to the science and education of villagers as well as information on alternative business activities other than in agriculture, plantation and forest product exploitation.

The pattern of remittances that occurred in Malinau was mostly remittance out of the village and remittance into the village. Out-remittance was done to finance family members that went for study outside the village. The transfer pattern was relatively regular with a certain amount and at certain times based on the educational needs. The remittances came from the utilization of agricultural and forest products. Therefore, households whose family members temporarily migrate were attempted to supplement their income from agricultural and forest products. Thus out-remittances intensified the use of agricultural and forest products.

Meanwhile, in-remittance was done by family members who temporarily migrate to earn livings for the families who living in the village. The remittances were used for various household purposes, including for labor wages that help farming and plantation businesses and to be sent to their family members who went for education outside the village. Thus, the transfer of money from family members who migrate to work outside the village could reduce the pressure or dependence on the utilization of agricultural products and forest products as their sources of income. Therefore, in-remittance had the opposite effect on the utilization of agricultural and forest products.

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The Authors declare that there is no conflict of interest with respect to the research, authorship, and/or publication of this paper.

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