

Changes and Diversity in Rules of Natural-resource Tenure by the Iban of Sarawak, East Malaysia

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Abstract

Land use based on secondary fallow forests created by the Iban, natives of Borneo, plays an important role for biodiversity conservation. It has been maintained and supported by the Iban's rules on natural resources. Previous studies clarified, for example, that the holder of land and the holder of fruit trees on it do not necessarily coincide; that there may be several holders of a fruit tree through inheritance; and that a land is held not by only one person, but also simultaneously by the community. Therefore, a single individual cannot determine conversion of land use. This prevents land with use based on secondary forests from being developed rapidly and on a large scale for mono-crop plantation, for example.

This paper, however, clarifies that today's tenure-rules of the Iban on natural resources, such as lands, forest products and fruit trees differ in several details from those reported previously. Those differences are brought about by changes of the rules toward 'modern' tenure institutions. For example: coincidence of the holder of land and fruit trees on it; possession of fruit trees by only a single person; and stronger holding rights of lands by individuals. The background to the changes includes the increase of value of the natural resources as commodities. It is also clarified that the rules are not always the same among different Iban longhouse communities, or even among persons living in the same longhouse community.

In recent decades, the Iban's rules have changed, and the changes may ease the progress of conversion of their lands, for example to mono-crop plantation, or to more profitable land use, but at the same time to land use bringing about serious biodiversity loss. Their institutions and society, however, have mechanisms which make the rules change gradually. Therefore, in their lands, developments will not progress in as short a time and in as large a scale as developments by corporate enterprises. The Iban's rules, though they have been changing, still retain mechanisms to conserve biodiversity.

1. Introduction

Various research has been conducted concerning the tenure of natural resources, such as land, natural useful plants, and fruit trees, by native people living in tropical rain forests areas in Southeast Asia.¹⁾ One of reasons why this topic has attracted such research interest is that there are crucial dif-

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ferences of concept between their tenure institutions and those of the modern institution [Weinstock and Vergara 1987; Sather 1990].

In the modern institution, an individual owner of a land has an exclusive right to use and disposal of the land itself and plants growing on the land. On the other hand, in the native people's institution, as provided by their adat, it has been shown that land ownership cannot be permanently held.²⁾ For example, in cases in Borneo, a holder of a fallow forest has a right to make a rice field there, and until the harvest he/she can exclusively manage the land and also the plants growing on it. In contrast, in the fallow period, the fallow forest is recognized as common property and natural growing plants in the forest may be taken by any longhouse members [Cramb 1986]. If a member of a longhouse moves to another longhouse, he/she loses his/her rights to lands in the former longhouse [Wadley 1997; Cramb 1986], those lands become common property of the longhouse [Cramb 1986]. That means that lands belong not only to individuals but also to the longhouse community.

For fruit trees, in a case of the Iban, natives of Borneo, the holder is not necessarily the holder of the land on which the fruit trees grow, but is the person who planted them [Sather 1990]. Since that holder's right is evenly inherited by all children of the planter, the holder is not necessary a single person [Sather 1990]. This rule makes it difficult for a landholder to drastically change the land use through only his/her individual decision, because the holders of the land and the fruit trees are different, and because there may be more than one holder [Sather 1990]. The characteristic of land as property of a longhouse community, as mentioned above, is also thought to effectively prevent disposal and development of lands by only the decision of a single individual.

The secondary forests in the Iban territory are maintained and supported by their tenure rules of forests and trees [Sather 1990]. Today in Borneo, while the area of mono-crop plantation, such as oil palm and *Acacia mangium*, has been rapidly expanded, native land use based on fallow forests has become more important for biodiversity conservation [Ichikawa 2007; Wright and Muller-Landau 2006].

However, after conducting preliminary interviews with some Iban in 2 or 3 of their longhouses, I found that their actual tenure rules might be considerably different from those described above. Regarding natural growing plants and fruit trees, the right of the landholder seems to be stronger.

1) Research on tenure system of natural resources by the native people in Borneo started in the beginning of the 1900s by Dutch researchers [Appell 1997]. In the last three decades, much research has been conducted, including Cramb [1986, 1989, 1993, 1998, 2007], Cramb and Wills [1990], Rousseau [1987], Sather [1990], Soda [1999], Weinstock and Vergara [1987], Wadley [1997, 1999], Appell [1986], Dove [1980, 1987, 1988], Morris [1976], King [1975], Hooker [1999], Peluso [1996], Jessup and Peluso [1985].

2) Therefore, in this paper, "hold" is used for the native people's tenure of the natural resources, instead of "own."

The holding right for fruit trees would be concentrated in a single person. Concerning landholding, in some circumstances, even after a member of longhouse moves to another longhouse, he/she may still hold his land in the former longhouse territory. Also, the rules do not seem to be always the same among all Iban, differing for example from one longhouse to another, or even from one person to another in the same longhouse.

It was already known that the Iban's rules have changed with changes in the social and economic conditions surrounding them [Cramb 1986, 1993, 2007; Dove 1980]. However, there are few reports so far about differences of recognition of the rules among the Iban. This paper firstly describes changes of rules and details of the differences as revealed by field research. Secondly, it examines whether today's changing rules still serve to maintain the natives' secondary forests that are important for biodiversity conservation. These are the objectives of this paper.

An outline of institutions of natural resource tenure by the Iban is explained in the following section, Section 2, and in Section 3, research methods and study area are shown. In Section 4, the results of the interviews are described. In Section 5, I analyze why the results of the interviews I conducted are different from those of earlier studies, and also why recognition of the rules differs between longhouses and individuals. Finally in Section 6, I examine how the Iban institutions can be evaluated from the viewpoint of biodiversity conservation.

2. Setting

2.1 *Outline of the Study Areas and the Iban*

Sarawak: Sarawak State has a tropical rain forest climate. The amount of rainfall varies between 3,000 mm and 5,000 mm depending on the region. Forests, including fallow lands with dispersed by rice fields, cover some 95% of the State [Department of Statistics Malaysia, Sarawak 2002]. The area of the State is around 120 thousand km², and around 2 million people live there [Department of Statistics Malaysia, Sarawak 2002]. The inhabitants are composed of various ethnic groups, including the Iban, Chinese, Malay, and Bidayuh. These are broadly divided into two categories, native people living there for a long time, and non-native people who have migrated into the area, such as Chinese and Indians. In Sarawak, excluding the Chinese who make up about 30% of the state population, almost all the population is native. The Iban is the biggest ethnic group, accounting for one third of the state population.

Progressive development in Sarawak has been observed over the last 2 to 3 decades in particular. Commercial logging and oil palm plantations have developed in forest areas, the road network has expanded, and there has been ongoing urbanization in major cities and towns such as Kuching, Sibul,

Bintulu and Miri. Development of the road network and urbanization are expected to continue [Economic Planning Unit, Malaysia 2001]. The Iban are surviving under the influence of such socio-economic changes [Ichikawa 2003].

Distribution of the Iban: The Iban originally inhabited the middle reach of Kapuas River in West Kalimantan, Indonesia. It is estimated that they migrated to Sarawak side in the 16th century [Pringle 1970]. After that, in association with the territorial expansion policy of the Brookes, English governors on Sarawak, the Iban expanded their area of habitation eastward to Sarawak [Pringle 1970]. Today the areas where they live are distributed in the middle and lower reaches of almost of all major rivers in Sarawak.

Longhouse: The Iban prefer to live in longhouses. In a longhouse, there is a chief, but his power is not very strong [Freeman 1970]. Compared to other tribes, the Iban are normally egalitarian without social strata [Freeman 1970]. In former days, a longhouse usually possessed a territory (*menoa*). However, today there are often several longhouses in a single former territory, because cutting virgin forests to establish a new territory and migration to look for another new territory have been limited by the government [cf. Hong 1987].

Bilek: Inside a longhouse, there is a common passage and along it there are compartments, called *bilek*, where members related by blood and marriage live together. *Bilek* members make their livelihood by utilizing lands and fruit trees together [Freeman 1970]. For the Iban, the *bilek* signifies more than a place and building to live. They strongly desire continuation of their *bilek*, including their properties and the members who manage them, and do not bring the *bilek* to an end, turning it over to their children in succession [Freeman 1970]. According to the Iban adat, one of the children and his/her spouse inherit the *bilek* from his/her parents, and that child usually also inherits much more property than the other children [Freeman 1970; Ichikawa 2008].

2.2 Adat Concerning Natural Resource Tenure and Management of the Iban

The native people of Sarawak including the Iban live their social lives based on their adat. The adat comprises all of the various customary norms, jural rules, ritual interdictions and injunctions that guide an individual's conduct, and the sanctions and forms of redress by which these norms and rules are upheld [Sather 1980]. The adat is not codified,³⁾ and even among the same Iban, details of their adat are not always same between different longhouses [cf. Cramb 1989].

When problems and conflicts occur in a longhouse, discussion to resolve them is held in a meeting in which a representative from each *bilek* participates [Cramb 1989]. In the meeting, a

3) Recently the state government (Majilis Adat Istiadat) compiled the Iban adat as a document for use as a standard for judgment of cases, but it only covers basic parts and is not detailed.

consensus is sought principally not by majority rule, but by discussion [Cramb 1989]. If the problem cannot be resolved at the longhouse level, the case is brought to the *Penghulu*, a chief appointed by the government to cover several longhouses. If the *Penghulu* cannot arbitrate, the case is brought to the adat court of the sub-district.

According to the Iban adat regarding land tenure, a person who opens up a portion of virgin forest and the members living with him in a *bilek* have usufruct of that land [Freeman 1970]. The right is inherited by *bilek* members who are his descendants [Freeman 1970]. According to the previous studies, there are considerable differences between the Iban's and the modern institution. Some topics, such as tenure right for fruit trees, natural useful plants, and lands of those who move out to another longhouse, have previously been explained as follows.

Tenure right for fruit trees and fruits [Sather 1990; Weinstock and Vergara 1987]: In the modern institution, a landowner is the owner of fruit trees growing on the land. In contrast, in the Iban's institution, a fruit tree is possessed by the person who plants it. Therefore, if fruit trees growing on land held by A were planted by B, B has holding rights regarding the fruit trees. The right is evenly inherited by the children of B, and from them inherited again by their children (grandchildren of B). Here, the child of B who inherits B's *bilek* has a stronger power to coordinate how to harvest and distribute fruits.

Natural useful plants [Cramb 1986]: When a rice-field is made by swidden agriculture, the land holder has a strong right to control the field, and other people are restricted from entering the land. After the harvest, the land is sometimes considered as common land for the longhouse members. For example, natural growing rattan, palms and the other useful plants in fallow forests are allowed to be collected by anybody in the longhouse.

Lands of those who move to another longhouse [Wadley 1997]: Those who move to another longhouse lose their holding rights to their lands in the original longhouse. If all members of a *bilek* move to another longhouse, their lands are left to the longhouse chief [Cramb 1986], or to their relatives, and their holding right to the lands is lost.

2.3 Evaluations of Iban Land Use from Viewpoint of Biodiversity Conservation

Ichikawa [2004] described the landscape in the Iban territory as being based on fallow forests. The forests are dotted with hill and swamp paddy fields, rubber gardens, pepper gardens, fruit tree groves, etc. They compose a mosaic landscape. The area of those agricultural fields is not more than two or three hectares. The characteristic land use is not to use lands perpetually for a single type of

use, for example for paddy making or pepper growing, but sometimes to allow the natural forest to recover, or to make gardens and groves by planting rubber and fruit trees with a similar structure to natural forests [Ichikawa 2004]. Changes of land use observed are not large in area or rapid, but occur slowly and in relatively small areas [Ichikawa 2007]. Today, there has been a rapid increase in areas of mono-crop plantation, such as oil palm. Under such conditions, the Iban's land use is positively evaluated from the viewpoint of biodiversity conservation [Ichikawa 2007; Wright and Muller-Landau 2006].

As mentioned in "Introduction" above, the Iban's land-tenure adat that allows natural resources to be held by a number of holders is a factor preventing disposal and development of land by only the decision of a single person. A similar effect is considered to be brought by the characteristics of their land tenure system, which recognizes lands as partly the property of a longhouse community. The Sarawak government has recently been attempting to convert the fallow forests of native people, as idle lands, to more economically productive purposes, such as oil palm plantation [Sarawak 1997]. From the viewpoint of biodiversity conservation, a large mono-crop plantation is not preferable land use. Could the Iban's institution of natural resource tenure prevent such development by oil palm plantations?

3. Methods and Study Areas

In order to identify differences in tenure rules between longhouses, I visited several longhouses and asked some questions concerning holdings of fruit trees, fruits, natural useful plants, and land to persons considered to be well versed in the adat, such as the longhouse chief or old men (see Appendix). The questions I asked interviewees are shown in Section 4 of this paper. In order to be easily understandable to the interviewees, the questions were designed around hypothetical cases that could actually occur. I also asked, when time was available, about actual cases relating to the questions in and around interviewees' longhouses. For each question, I asked about the situation in the past as well as today's situation. The "past" refers to the period from the times of the interviewee's parents until recently, which is the period they know well. The number of interviewees was 16 persons from 15 longhouses (see Appendix). The fieldwork was conducted in March and April, 2005.

Research areas: Field research was conducted at 15 longhouses in mainly 2 areas (Fig. 1): The first area was located along the Bakong River, a tributary of the Baram River. The Iban migrated there at the end of 19th century and the first part of 20th century, from the western part of Sarawak, which is Sri Aman Division today. The chiefs of the longhouses are the third to fifth generation from the first migrant generation. The other area is Sri Aman Division, where there are many longhouses with fairly long histories. Normally the chiefs are at least the

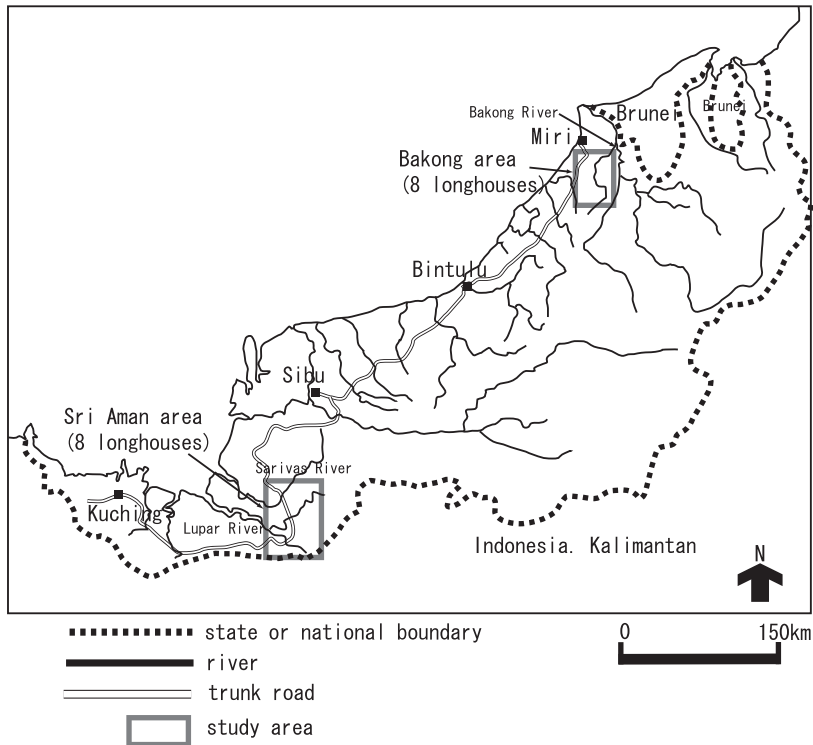


Fig. 1. Study Area

6th generation. I chose these two areas to examine possible differences in their adat or institutions because they have been inhabited for different periods.

4. Results

The answers to the questions are summarized in Table 1 and appendix table. Interviewees No. 1 and 2 in the appendix live in the same longhouse, and No. 3 and 4 lived in the same longhouse until the mid 1960s, when the longhouse split into two. All of interviewees except No. 8 were born into their current longhouse community.

Table 1 does not show any clear difference between the 2 research areas. Although many Iban have converted to Christianity, the religion does not seem to significantly affect their institutions for natural resource tenure.

4.1 Holding of Lands and Fruit Trees

Questions

- (i) Can fruit trees be planted in an area held by other *bilek* members?
- (ii) Two brothers planted fruit trees in lands of their parents when the brothers were still single

Table 1. Summary of the Interviews (Number of Individuals Responding)

Questions	Answers	Bakong area	Sri Aman area	Total
1. Fruit trees and fruit (i) Can you plant in another <i>bilek</i> 's land?	Impossible now. But in the past, yes. Planter was the holder.	4	3	7
	Impossible now and in the past	4	5	9
(ii) Who do fruit trees planted by elder brother in his younger brother's land belong to?	Elder brother	2	2	4
	In the past, elder brother. Now, younger.	3	0	3
	Younger brother, both now and in the past	3	4	7
	Other answers	0	2	2
2. Natural useful plants (i) Can you freely take them from fallow forests of another <i>bilek</i> ?	Possible even now	3	3	6
	In the past, possible. Now impossible.	5	2	7
	Impossible both now and in the past	0	3	3
(ii) Can you freely take them from rubber gardens and fruit trees groves of another <i>bilek</i> ?	In the past, possible. Now impossible.	4	2	6
	Impossible both now and in the past	4	6	10
3. Lands of those who move from one longhouse to another	Give them to any relatives.	5	6	11
	Give them to only parents and brother, sister.	2	1	3
	If newly-pioneered lands, the longhouse chief manages them.	1	1	2

and lived together as members of their parent's *bilek*. When the younger brother married and became independent from the parent's *bilek*, the parents gave him a piece of land.⁴⁾ There were fruit trees planted by the elder brother on the land. Who has the holding right of those fruit trees?

(iii) In the harvest season for fruits, can persons other than those with holding rights to the fruit trees harvest the fruit?

Answers

Answers to question (i): All of the interviewees answered that today nobody is allowed to plant fruit trees in lands held by other persons. If fruit trees are planted in a land held by another person, the trees belong to the person who has the land. Seven interviewees answered, however, that 10 to 40 years ago, fruit trees could be planted and would have belonged to the planter. One of inter-

4) According to the Iban adat, when a child become independent from his/her parent *bilek* after marriage and builds a new *bilek* in the same longhouse, it is usual that the parents hand over to him/her pieces of their lands and valuable goods, such as jars, plates, drums, etc.

viewees added that the land holder rather welcomed such trees being planted by someone, because not only the planter but the land holder also could have a part of the right to harvest the fruit. Before, fruit trees were sometimes planted when someone borrowed a piece of land from another *bilek* to grow paddy,⁵ he/she planted fruit trees around a temporary working hut, or fruit seeds thrown away from the working hut germinated and grew. The holding right for the fruit trees is inherited by the original planter's child who takes care of the *bilek* of the planter. Nobody suggested that the right was evenly inherited by all of the planter's children. They said that the successor's brothers and sisters can also harvest fruits, but with permission from the successor.

As mentioned above, in recent decades, planting fruit trees in lands held by other *bilek* has been prohibited. One reason given is an increase in conflicts between land holders and the fruit planters and their descendants. They sometimes claim to hold the right to the lands where fruit trees are planted. In land deals⁶ among the Iban today, the buyer does not want a land with fruit trees planted by other people, according to comments from No. 1 and No. 3 (Appendix). The reason is that the problems of land holding right mentioned above sometimes happen, and if the buyer cuts down the fruit trees, the planter might demand compensation.

In contrast, 9 interviewees explained that it had even been prohibited to plant fruit trees in lands held by other persons in the past. They said this rule has existed from at least their parent's period and perhaps even before that. It is uncertain whether the rule has not changed from the original, or has changed as mentioned above at a point further back in history.

Answers to the question (ii): 4 of the interviewees answered that the fruit trees belong to the elder brother who planted them, and that he has right to harvest the fruit. Three interviewees replied that today the holding right of the fruit trees transfers to the younger brother who holds the land, although the right to the fruit trees belonged to the elder brother before. These answers even differed between interviewees living in the same longhouse (No. 1 and No. 2, see Appendix). Seven interviewees answered that holding right for the fruit trees transfers to the younger brother, and that it would have been transferred in the past, too. Some of them explained, however, that although one of the brothers has a stronger right to the fruit trees, in the case of brothers the fruit trees are actually considered to be common property. Therefore benefit from the fruits should be divided between them.

In different answers from those mentioned above, one interviewee said that the fruit trees will

5) Borrowing land for growing paddy is a usual practice among the Iban [Padoch 1982].

6) Land deals between the Ibans are commonly observed today not only in the Bakong basin, but also in the other areas of Sarawak. Since there are many lands not registered to the government, the contract procedure is not through the government but personally made with longhouse chief as witness.

belong to the successor of the parents' *bilek*, and another interviewee answered that the fruit trees are common property among parents and their children. The reason given was that the elder brother was a member of the *bilek* when he planted them, and therefore, the fruit trees are considered as a property of the members of the *bilek*.

Answer to question (iii): All of the interviewees answered that the fruit belongs to the fruit tree holder, but everyone from the same longhouse is allowed to eat fruits fallen under the fruit tree. Nine interviewees said that the fallen fruits cannot be taken to another place, such as the longhouse, while 7 interviewees said that several fruits could be taken, but it is prohibited to sell them. Among the 9 persons who answered that the fruits cannot be taken away, 2 persons said that it had been possible to do this before, while the other 7 said that it had not been possible in the past, either. No. 16 (Appendix) said that around 40 years ago, even fruit belonging to a member of another *bilek* could be taken. He explained those who harvested fruits earlier could hold them.

4.2 Natural Useful Plants

Question

Can natural useful plants, such as rattans, palms, ferns, mushrooms, etc., grown in fallow forests, rubber garden and fruit grove be collected by those who do not hold those lands?

Answers

Six interviewees answered that anyone from the same longhouse can collect the plants, but that this applies only to fallow forests. No. 1 (Appendix) said that 30 years ago, even collection by someone from outside the longhouse was not condemned. On the other hand, 7 interviewees answered that although anyone from the same longhouse could collect such plants 20 or 30 years ago, today they cannot, because the plants belong to the landholder. Three interviewees said that only the landholder is able to collect them, and that the same situation applied in the past, as well. The reason given for why such plants cannot be collected today, although they could be collected in the past, is that the plants are now saleable in towns and urban areas, according to all of the 7 interviewees. One interviewee (No. 13 of Appendix) answered that today, collection of plants that are valuable as a commodity is prohibited, but collection of less valuable ones is permitted. In these answers, opinions differ between the interviewees living in the same longhouse (No. 1 and No. 2), and between the interviewees who previously lived in a longhouse of a same territory (No. 3 and No. 4).

Answers regarding use of the natural useful plants in rubber gardens and fruit groves also vary depending on the interviewees. Although all of the interviewees answered that the collection of the plants is basically prohibited, 7 interviewees said that it had once been allowed, while 9 interviewees

said that it had not been allowed in the past, either. An interesting point is that 6 persons who answered that collection is allowed in fallow forests replied that the collection in rubber gardens and fruit tree groves is not allowed. They explained that natural plants growing in an area covered all around by planted plants, such as rubber and fruit trees, belong to the holder of the rubber garden and fruit tree grove.

Some problems concerning rights to the natural useful plants are observed today. For instance, people living in the longhouse No. 1 (Appendix) earned a part of their income from making baskets using rattan taken from forests and selling them. They have sometimes collected rattan from forests located in territories of neighboring longhouses. It is because, as mentioned above, the collecting rattan by people from outside the longhouse was not condemned before. Today, however, those longhouses have condemned their collection of rattan as “stealing.”

4.3 Land Rights and Land Deals by Persons Who Move to Another Longhouse

Question

If all members of a *bilek* move to another longhouse located in different territory, how are their lands handled?

Answers

Fourteen interviewees answered that the lands should be left and given to their relatives. Three of them added that the land can be left only to parents, brothers or sisters who remain in the longhouse. In a rare case where the members of the *bilek* who move to another longhouse do not have any relatives, their lands will be managed by the longhouse chief. Longhouse members with insufficient land can ask to borrow them from him. Two interviewees explained that lands inherited from parents can be left to relatives, but that lands pioneered themselves by the people who are leaving cannot. Those lands should just be left to the longhouse chief.

There were 2 interviewees who answered that lands cannot be sold when the holders move. The other interviewees said that today the lands can be sold, although they could not be sold before, because lands were not so valuable and a price could not be put on them. There is a condition that lands can only be sold just before a move.

According to previous studies, those who move to another longhouse territory lose their holdings of lands in the original longhouse. However, one who lives in the same longhouse to No. 1 (in Appendix) said that recently even someone who moved away from his longhouse has been allowed to keep their right for lands. Also, according to No. 1, his younger sister, who married out to another longhouse, has obtained a piece of land recently. She married out about 50 years ago to a longhouse

located 20 km from her original longhouse. In 2001, the brothers and sisters of No. 1 tried to divide a land which had existed as a common land between them. In that occasion, No. 1's sister insisted that she be given a share of the land, and this was approved. Before that, she was not allowed to hold a right for any lands in her original longhouse. However, today she is allowed to hold land there, because she can sometimes come back to her original longhouse now that a trunk road has been constructed. That is an example of a land whose value rose because it is located near the trunk road.

5. Discussion

5.1 *Changing of Tenure Rules as a Result of Commercialization of Natural Resources*

I have explained the tenure rules on fruits and fruit trees, natural useful plants, and lands. This paper presents several significant differences observed from the tenure rules explained by the previous studies. According to the previous studies, the fruit tree holder is the planter of the tree, so that the holder of the tree and the holder of the land where the tree grows are not necessarily the same. On the contrary, in this research some 60% of the interviewees answered that today the fruit trees belong to the landholder, regardless of who planted them. This means that the holder of the land and the holder of the fruit trees are coincident. Most interviewees said that the rule changed during the past 2 or 3 decades, although some said the rule was always the same from long ago. In short, previously, the planter was the holder, but the rule has been changing so that the fruit trees belong to the landholder.

Similar changes are observed for usufruct of natural useful plants. According to the previous studies, natural useful plants growing in fallow forests can be freely taken by anybody in the longhouse community. On the contrary, in this research, many interviewees answered that the holder of the land in which the plants grow has the usufruct. That is to say, the rights of the land holder have become stronger regarding using and holding of fruit trees and natural useful plants.

Concerning lands, moving from a longhouse to another longhouse in another territory would previously have resulted in a landholder losing his/her land rights. However, this research has observed some signs of changes, whereby the person moving may be able to continue to hold the rights to the land. Shinozuka [1974] insists that there are 2 types of land tenure rights, the Roman and the German type. In the Roman type, land owners have absolute and exclusive right to their land. It can be seen as being a "modern" type of land tenure. On the other hand, in the German type, the right of the community to land is strong. In the countries of Western Europe, the change from the German to the Roman type occurred in the period from the 18th century to the late 19th century [Shinozuka 1974]. A similar change has been observed in today's Sarawak.

The changes, such as the coincidence of holder of land and fruit trees and natural useful plants, and the continuous holding of land rights by persons moving out from the longhouse, appear to indicate that the Iban's institution is assimilating to the modern tenure system. In particular, commercialization of the natural resources is commonly observed in the social and economic background to the change, although government policies which have been promoted to introduce modern institutions have also affected the Iban's rules [Cramb 1993].

According to the interviews, the commercialization started in the latter half of the 1960s. In Sarawak, trunk roads passed in the middle and lower reaches of major rivers where the Iban mainly live, and road networks were developed based on the trunk roads. The roads connected the urban areas, such as Kuching, Sibul, Bintulu and Miri, and those also started developing in that period. Urbanization particularly accelerated after the 1980s. Under those conditions, the value of lands located near roads increased near urban areas, and increases in demand for fruits and natural useful plants in urban areas were observed. As a result, some of the problems mentioned started to occur, such as land disputes and "stealing" of fruits and natural useful plants. The changes mentioned above occurred among the Iban in order to avoid disputes on land and natural-resources, and to introduce exclusive ownership of the natural resources.

5.2 Differences of Recognition of the Rules Depending on Longhouse and People

Although we normally refer to "the Iban rule" as a single entity, details varied depending on the longhouse. As already mentioned, answers even differed between persons who had previously lived in the same longhouse, and between persons living in a same longhouse who are recognized as well versed on their adat.

In order to examine why those differences occur, we need to know the learning processes for the rules. Although that point was not examined in detail in this research, some likely reasons why the differences happen are described below, based on information gained during the interview process.

In Sarawak where fundamentally the population density is low, access to fruits, natural useful plants, and lands was more open before they became commercialized, according to some interviewees. They said that rules on uses and belongings were also less stringent.

However, as the value of those commodities rose, disputes and conflicts on holdings and uses of them occur. The disputes and conflicts have been resolved by achieving consensus through discussion between individuals, in meetings of a longhouse, and sometimes through meetings between longhouses. If the problems were still not resolved at those levels, the Iban go to the *Penghulu* and to the native court for the sub-division, which are higher levels for settling problems. In the interviews, interviewees sometimes explained their rules, referring to how problems occurring in and near their

longhouses were resolved. That is to say, the Iban's rules are changing and reconstructing, incorporating new consensuses made at various levels through the process of resolving problems that have actually happened. In particular, the rules on natural resources tenure, which is the topic dealt with in this paper, have been in a process of drastic change, affected by recent commercialization. This is why recognition of the rules differs from longhouse to longhouse and from individual to individual.

6. Concluding Remarks: Diverse Recognition and Slow Change of Iban's Rules

Iban land-use, consisting mainly of fallow forests with small patches of agricultural fields, is considered increasingly important for biodiversity conservation [Ichikawa 2007; Wright and Muller-Landau 2006]. The land use has been maintained and supported by the Iban's rules of natural resource tenure. According to the rules studied previously [Sather 1990], a land and plants grown on it may be held by several persons, not just one individual. Also, the Iban sense of belonging includes the concept that their lands partly revert to the community. Therefore, a decision to develop the land is made by not only one individual, but through consensus of several persons. Hence, land development, for example for mono-crop plantation, is not easily carried out.

However, as observed in this paper, their rules have been changing, especially in recent decades, and details have been assimilating to those of modern institutions. For example, many interviewees answered that the right of using plants growing on a land is exclusively held by the landholder. Also, although there were not so many cases, some explained that someone who moved to another longhouse can continue to retain his/her holding of the lands of his/her original longhouse. The background to these changes is considered to include the fact that lands, natural useful plants and fruits have become more valuable commodities as urbanization and construction of roads which connect Iban longhouses and the urban areas have progressed. In the future, the value of those commodities is likely to increase under progressing urbanization and development of road networks in Sarawak. As the characteristics of the Iban rules change into those of modern ones, mono-crop plantation development in their fallow-forest based land-use will progress more readily. Such changes observed in this paper would work negatively for maintaining Iban land use that is beneficial for biodiversity conservation.

However, I still consider that the way the Iban's rules change retains positive factors for maintaining their land use. As examined, in the process of changing rules, conflicts of tenure occur between people who have different recognitions of tenure rules. In such cases, they look for resolutions not by majority rule, but by achieving consensus between them, principally by discussion. Hence, the consensus building takes long time. As this kind of process happens in various Iban

areas, their rules do not all change at once in a similar way being reconstructed in a form more applicable for their current life in each area. This process prevents drastic changes from rapidly affecting the whole of Iban society. Therefore, although the function of the Iban's rules of natural resource tenure for biodiversity conservation has been decreasing, it will still continue having power to prevent drastic land-use changes throughout the whole Iban area or on a large scale at once. The changes in the Iban's land use will be slow and small in scale, in contrast to the changes to mono-crop plantation development.

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Appendix 1. Summary of Interviews (Longhouses in Bakong Area)

No.	1	2	3	4	5	6	7	8
Post of informant in longhouse (age)	former coordinator of land conflict (72)	longhouse chief (68)	chief of adat on agricultural activities	longhouse chief (75)	<i>penghulu</i> (67) and longhouse chief (54)	<i>penghulu</i> (56)	longhouse chief (75)	husband of aunt of the longhouse chief (66)
Generation of the present longhouse chief after the first chief	4th	4th	5th	4th	6th	3rd	4th	3rd
I. Fruit/fruit trees								
1. Is it possible to plant fruit trees on lands of other <i>bilek</i> ?	Impossible today, but was allowed 30 years ago. In that time, land holder also had right to collect fruit.	Impossible today but was allowed 30 years ago.	Impossible today but was allowed 30 years ago.	Impossible today but was allowed 30 years ago. Fruit trees were considered to be common property.	Impossible today as well as in the past. If fruit trees are/were planted, they would belong to the land holder.	Impossible today as well as in the past. If fruit trees are/were planted, they would belong to the land holder.	Impossible today as well as in the past. If fruit trees are/were planted, they would belong to the land holder.	Impossible today as well as in the past. If fruit trees are/were planted, they would belong to the land holder.
2. Rights to fruit trees and their inheritance after independence of the younger brother	The fruit trees belong to the elder brother, and are inherited by his children. Seedlings from the fruit trees belong to the younger brother.	Today, the fruit trees belong to the younger brother. In the past, to the elder brother. However, even today they can collect fruit together, because they are siblings.	Today, the fruit trees belong to the younger brother. In the past, they belonged to the elder brother. But actually the informant has fruit trees planted on the land of another <i>bilek</i> , and he even today is collecting the fruit.	Today the fruit trees belong to the younger brother. In the past, to the elder brother. However, even today they can collect fruit together, because they are siblings.	They belong to the younger brother who holds the land. Even in the generation of the informant's grandfather, the rule was the same.	They belong to the younger brother who holds the land. Even in the generation of the informant's grandfather, the rule was the same.	In principle, they belong to the elder brother, and are inherited by his children. But it is better that the elder brother transfers them to the younger brother.	They belong to the younger brother who holds the land.
3. Rights to fruit	Anyone is allowed to eat fallen fruit only, including people outside the longhouse community. Although in the past, anyone was allowed to take away several	Any person in the same longhouse community is allowed to eat fallen fruit only. Although in the past, anyone was allowed to take away several pieces of fruit,	Any person in the same longhouse community is allowed to eat fallen fruit only. Today and in the past, it is/was not allowed to take fallen fruit away.	Any person in the same longhouse community is allowed to eat fallen fruit only. Today and in the past, it is/was not allowed to take fallen fruit away.	Any person in the same longhouse community is allowed to eat fallen fruit only. Taking away a few pieces of fallen fruit is allowed, but selling them is not allowed.	Any person in the same longhouse community is allowed to eat fallen fruit only. Today and in the past, it is/was not allowed to take fallen fruit away.	Any person in the same longhouse community is allowed to eat fallen fruit only. Taking away a few pieces of fallen fruit is allowed, but selling them is not allowed.	Any person in the same longhouse community is allowed to eat fallen fruit only. Taking away a few pieces of fallen fruit is allowed, but selling them is not allowed.

	pieces of fruit, this is not allowed today, except for relatives. If relatives want to sell the fruit, they must ask the holder of the fruit tree.	this is not allowed today, except for relatives. If relatives want to sell the fruit, they must ask the holder of the fruit tree.				Persons who take away and eat fruit must leave a sign (tandah).	
II. Natural useful plants							
1. Is it allowed to take natural useful plants grown in fallow forests of other <i>bilek</i> ?	Today, they are allowed to be collected by anybody in the same longhouse community. In the past, even people outside the community were allowed to do this.	Today, they are not allowed to be collected. 20 years ago, it was allowed, but not for selling.	Today, they are allowed to be collected by anybody in the same longhouse community.	Today, they are not allowed to be collected. But 20 years ago, it was allowed. It was better to inform the land holder before collecting them.	Today, it is not allowed to collect them without permission from the land holder. But before the 1970s, it was allowed without permission.	Today, they are not collected. Before the mid-1980s, it was allowed if the collector officially informed everybody of it in longhouse meeting.	Today, low value commodity plants such as upa rua, paku, selikai, and sotar are allowed to be collected, but not high value plants such as rotan and upa pantu. In the past, it was allowed to collect anything.
2. Is it allowed to collect natural useful plants growing in rubber groves and fruit gardens of other <i>bilek</i> ?	No collection is/ was allowed today or in the past. No plants can be taken from there without permission.	(same as above)	No collection is/ was allowed today or in the past. No plants can be taken from there without permission.	(same as above)	(same as above)	(same as above)	No collection is/ was allowed today or in the past.
III. Removal and lands							
How should lands be dealt in case of removal?	The lands are left to his/her relatives. If his/her children come back in the future, the lands will be given back to them. If there are no relatives, the lands will be managed by the	The lands are left to his/her relatives. If there are no relatives, the lands will be managed by the longhouse chief. Today, lands can be sold in case of removal.	The lands are left to only his/ her parents and siblings, but not to cousins. If there are no parents and siblings, the lands should be left to the longhouse chief. He cannot	<i>Tanah barru</i> , lands who move, are managed by the longhouse chief. He lends the land to those who have little land. Lands inherited from parents are given	The lands can be left to only his/ her parents and siblings. If there are no such relatives, the lands should be left to the longhouse chief. He lends the land those who	The lands can be left to only his/ her parents and siblings. If there are only cousins, a meeting will held with the longhouse chief. If there are not even cousins, the longhouse	The lands are left to any relatives. If there are not any relatives, the lands will be managed by the longhouse chief. He lends the land those who have little land.

	longhouse chief. Today, lands can be sold in case of removal.	If there were no relatives, the longhouse chief managed them.	sell that land, but will provide the land those who have little land. Lands can be sold before the removal, but cannot after.	to parents and siblings.	have little land.	chief will manage the lands. Lands cannot be sold in case of removal.
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Appendix 2. Summary of Interviews (Longhouses in Sri Aman Area)

No.	9	10	11	12	13	14	15	16
Post of informant in longhouse (age)	longhouse chief (55)	<i>Pemancha</i> (84)	longhouse chief (62) and other old men	regional chief (<i>tuai muraqa</i>) (75)	longhouse chief (58), <i>penghulu</i> (57)	longhouse chief (67)	longhouse chief (65)	longhouse chief (70)
Generation of the present longhouse chief after the first chief	The name of the longhouse chief is remembered to at least 5 generations ago	More than 6 generations	The name of the longhouse chief is remembered to at least 7 generations ago	17th	6 generations ago, a longhouse was split into 6. This longhouse is one of those.	At least 10 generations	The 8th generation after removal from the upper stream	The name of the longhouse chief is known to at least 6 generations ago
I. Fruit/fruit trees								
1. Is it possible to plant fruit trees on lands of other <i>bilek</i> ?	They belong to the younger brother who holds the land. The elder brother must ask him before collecting fruit.	Impossible today as well as in the past. If fruit trees are/were planted, they would belong to the land holder.	Impossible today as well as in the past. If fruit trees are/were planted, they would belong to the land holder.	Impossible today but was allowed 20 years ago.	Impossible today. If planted, the land holder is allowed to cut them down. It was allowed 10 years ago, and the trees were inherited by the planter's children.	Impossible today as well as in the past. If fruit trees are/were planted, they would belong to the land holder.	Impossible today as well as in the past. If fruit trees are/were planted, they would belong to the land holder.	Impossible today. It was allowed if 40 years ago, and the trees were inherited by the planter's children.
2. Rights to fruit trees and their inheritance after independence of the younger brother	The fruit trees belong to the younger brother. They can collect fruit together because they are siblings, although the younger brother has a stronger right to collect them.	Today as well as in the past, they belong to the younger brother who holds the land.	They belong to the younger brother. However, in the case of siblings, they are usually considered to be common property.	They belong to the elder brother who planted them.	They belong to the elder brother who planted them, and are inherited by his children. However, in the case of siblings, they are sometimes handled as common property.	Although the younger brother has a stronger holding right, they are common properties for them. This is an adapt from a long time ago.	Those are common property because they were planted when both siblings were still in the same <i>bilek</i> . If one of them wants to collect fruit, he should first ask his parents and siblings.	They belong to his parents (head of <i>bilek</i>) or his successor, because were planted when the siblings were still in same <i>bilek</i> .

3. Rights to fruit	Any person in the same longhouse community is allowed to eat fallen fruit only. Today and in the past, it is/was not allowed to take fallen fruit away.	Any person in the same longhouse community is allowed to eat fallen fruit only. Today and in the past, it is/was not allowed to take fallen fruit away.	Any person in the same longhouse community is allowed to eat fallen fruit only. Today and in the past, it is/was not allowed to take fallen fruit away.	Any person in the same longhouse community is allowed to eat fallen fruit only. He/she is also allowed to take such fruit away, but selling it is not allowed. Even today, they share the benefits of selling fruit collected from common fruit trees.	Any person in the same longhouse community is allowed to eat fallen fruit only. He/she is also allowed to take such fruit away, but selling it is not allowed.	Any person in the same longhouse community is allowed to eat fallen fruit only. He/she is also allowed to take such fruit away, but selling it is not allowed.	Any person in the same longhouse community is allowed to eat fallen fruit only. He/she can also take away such fruit, but only for self consumption. 40 years ago, it was allowed to collect fruit from trees belonging to other <i>bileks</i> . Fruit belonged to the person who collected it first.
II. Natural useful plants							
1. Is it allowed to take natural useful plants grown in fallow forests of other <i>bilek</i> ?	Today, it is not allowed. In the past, it was allowed, although better asking permission first from the land holder.	It has not been allowed from before.	Today and even before, it is/was allowed to be collected by anybody in the same longhouse community.	Today and even before, it is/was allowed to be collected by anybody in the same longhouse community. However, his son, 37 years old, said that today it is not allowed any more.	Today and even before, it is/was not allowed.	Today and even before, it is/was allowed to be collected by anybody in the same longhouse community.	It was allowed until first part of 1970s, but from 1980s it has not been allowed.
2. Is it allowed to collect natural useful plants growing in rubber groves and fruit gardens of other <i>bilek</i> ?	(same as above)	(same as above)	No collection is/was allowed today or in the past.	No collection is/was allowed today or in the past.	(same as above)	(same as above)	Plants with low value as commodities, such as shoots of fern and bamboo, are allowed to collect, but those with high value are not.

III. Removal and lands								
How should lands be dealt in case of removal?	The lands are left to only parents and/or siblings. If there are no parents or siblings, the longhouse chief manages them. Lands can be sold after being registered with the government.	The lands are left to any relatives.	<i>Tanah baru</i> , lands pioneered by those who remove, are managed by the longhouse chief. He lends the land to those who have little land. Lands inherited from parents are given to parents and siblings. The lands can be sold before the removal.	The lands are left to any relatives.	The lands are left to any relatives. If there are no relatives, those are left to the longhouse chief.	The lands are left to any relatives. Rubber gardens with certification can be sold, but actually so far nobody has sold lands.	The lands are left to any relatives. Land cannot be sold.	The lands are left to any relatives. Land can be sold.