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## **AGROFORESTRY PRACTICES CONTRIBUTION TOWARDS SOCIOECONOMICS: A CASE STUDY OF TAWAU COMMUNITIES IN MALAYSIA**

### **SUMMARY**

Agroforestry is a key indicator in terms of socioeconomic level towards developing countries especially to rural communities for sustainable development. Generally, agroforestry practices are valued environmentally, economically and socially. However, a key problem within recent literatures in relation to agroforestry practices is lack of awareness and knowledge among local community in rural areas. The aim of this study was to identify the contribution of agroforestry practices towards socioeconomics of communities in Merotai Besar, Tawau, Sabah, Malaysia. The data collection was conducted by questionnaire, which was randomly distributed to 250 respondents from five (5) villages namely Merotai Besar, Simpang Tiga, Kijang, Langsat and Iban. Majority of respondents strongly agreed that agroforestry practices could provide food resources for the wellbeing of rural communities. More than half of the communities in Merotai Besar area practiced agrisilvicultural system. A small number of residences in the study area also practiced agrosilvopastoral and silvopastoral systems. In spite of the fact that 93.2% of respondents were practicing agroforestry, they lack awareness that they were practicing agroforestry. This was due to poor dissemination of agroforestry information. This paper suggests that policy makers should encourage stakeholders to provide training and skills development centre to enhance the community's knowledge. Furthermore, it is necessary to encourage active community-based management practices within respective villages for sustainable economic development and to ensure prosperity for all. In conclusion, agroforestry practices can expand the socioeconomics level to reduce poverty of rural communities in Tawau area.

**Keywords:** Socioeconomic, agroforestry practices, rural communities, Borneo

### **INTRODUCTION**

Agroforestry is one of the sectors that have contributed to the socioeconomics' of Malaysia communities especially in rural areas. Agroforestry

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have the potential to become an effective tool for land uses' sustainable management. It also plays a crucial part in ensuring sustainable development by balancing and managing natural resources (Azmy *et al.*, 2013). Generally agroforestry have a positive impact in terms of ecological, economics and social to most communities. For some communities agroforestry was the main source to generate income, provided safe and healthy food and ensured job opportunity (Keat, 2018). Although agroforestry practices provide greater social impacts, it is more labour intensive and requires local knowledge of agriculture and forestry (Hashim *et al.*, 2012). Tree planting is one of the strategies applied in agroforestry to alleviate farmer's quality of life by fully utilization of available resources (Nair, 1993).

Agroforestry is defined as systems of land use on the same plot that integrates diverse outputs production with key component inclusive of combination of trees with crop or animals (Nair, 1991). Agroforestry practices in Malaysia involve four major systems of agroforestry, namely agrosilvicultural, silvopastoral, silvofisheries and agrosilvopastoral (Mohd. Nazip *et al.*, 2000). In Malaysia majority practiced agrosilvicultural systems. However, research on agroforestry in Malaysia is limited (Keat, 2018). Communities in rural areas that are practising agroforestry were unaware that they are actually involved in agroforestry sector were reported in recent studies (Mohd. Nazip *et al.*, 2000; Aminuddin *et al.*, 2008; Azmy *et al.*, 2013). This was due to lack of knowledge and understanding on agroforestry practices among local community in rural areas. Agroforestry practices are largely monopolized by rural community who do not have high levels of education resulting difficulties to identify the constraints in relation practicing it. Furthermore, without better understanding and knowledge, rural community will use excessive land without knowing the negative effects that will be faced in the future.

Smallholders are one of the potential users of agroforestry but scientific data on smallholders' agroforestry practices is still lacking in Malaysia especially on the East Coast area (Aminuddin *et al.*, 2008). Even though local community lack awareness on agroforestry practices, indigenous knowledge passed down to the next generation is crucial for conservation of environmental and biodiversity for livelihood sustainability (Ab. Halim *et al.*, 2012). Therefore, these studies were conducted to identify Merotai Besar communities' knowledge on agroforestry practices and whether this sector contributed on the communities' socioeconomics.

## MATERIAL AND METHODS

This study was conducted in Merotai Besar, Tawau, Sabah, Malaysia (4° 25' 8" N; 117° 46' 32" E), which is 24 km away from Tawau city. Five villages in Merotai Besar have been selected for this study area: Merotai Besar, Simpang Tiga, Kijang, Langsat and Iban.

The selection of villages included in this study were based on that local communities were practicing agroforestry systems was done after discussion with

Mr. Harris Chashuri as the Head of Villages (Ketua Kampung). In addition, people living in these areas carry out agricultural activities as food resources for household consumption and livelihood. Other than that, these villages had been listed as the best in agricultural activity and have received social media coverage (Harris Chashuri, personal communication, 2017). From these five selected villages, 670 households had been identified as practising agroforestry systems from respective head of villages. A total of 250 respondents were successfully interviewed between July and August 2017. A survey written in Malay Language was also distributed to respondents which sociodemographic and socioeconomics of the household were successfully recorded. The questionnaire was designed to assess agroforestry knowledge and socioeconomic contribution of local communities practising agroforestry systems in Merotai Besar, Tawau.

## **RESULTS AND DISCUSSION**

### **Agroforestry Practitioners Sociodemographic**

Men are more involved than women in agroforestry activities (Keat, 2018). The majority of the respondents were male (63.2%) and 36.8% were female (Table 1). Most of the respondent age was 31-54 years. Half of the number of respondents only attended primary school and a significant number did not receive any formal education. Merotai Besar communities consist of multi diverse group ethnics and majority practices Islam (Mohd Hamdan *et al.*, 2017). Based on this result, the respondents were working in agriculture and business sector that were related to agroforestry activities. Majority of the respondents earn below the poverty line. Agroforestry is a sector that can decrease poverty rate of community living in rural areas (Ahmed Azhar *et al.*, 2008).

### **Agroforestry Practices Contribution**

Agroforestry practices had improved the wellbeing of rural communities in terms of environment, economic and social in Merotai Besar (Figure 1). The majority of agroforestry practitioners in Merotai Besar strongly agreed that agroforestry practices had provided them food resources such as vegetables, fruits and meat. The agroforestry practices support sustainable development in providing food resources to local communities and conjointly ensuring food security (Fanish & Priya, 2013). Simultaneously, agroforestry practices contributed to the development of their residential areas (Figure 1). Furthermore, agroforestry had created job opportunities for local communities living in Merotai Besar, which is located far away from the closest city, Tawau city. By venturing into agroforestry related activities, local communities in Merotai Besar were able to generate more income. Job opportunities can reduce the poverty rate of the local communities in line with the government's efforts to eradicate poverty in rural communities (Nik Hashim, 1996). Significantly, agroforestry practices give more positive impact compare to negative impact to rural communities.

Table 1. Sociodemographic and socioeconomic of agroforestry practitioners living in Merotai Besar, East Malaysia.

<b>Variables</b>	<b>Frequency</b>	<b>Percentage (%)</b>
<b>Gender</b>		
Male	158	63.2
Female	92	36.8
<b>Ethnic</b>		
<i>Tidung</i>	89	35.6
<i>Bugis</i>	56	22.4
Javanese	64	25.6
<i>Iban</i>	23	9.2
Others	18	7.2
<b>Religion</b>		
Islam	220	88
Christian	26	10.4
Hinduism	1	0.4
Buddhist	3	1.2
<b>Age</b>		
≤18 years	1	4
19-30 years	30	12
31-54 years	164	65.6
≥55 years	55	22
<b>Education Status</b>		
No Formal Education	39	15.6
Primary School	124	49.6
Secondary School	83	33.2
University/College	4	1.6
<b>Marital Status</b>		
Single	27	10.8
Married	199	79.6
Divorced/Widowed	24	9.6
<b>Monthly Income</b>		
≤ RM400	53	21.2
RM401 - RM800	121	48.4
RM801 - RM1, 200	60	24
≥ RM1, 201	16	6.4
<b>Job</b>		
Public Sector	4	1.6
Private Sector	49	19.6
Farmer	99	39.6
Fishermen	5	2
Business	90	36
Others	3	1.2
<b>Side Job</b>		
Farmer	137	54.4
Business	112	44.8
Others	1	0.4

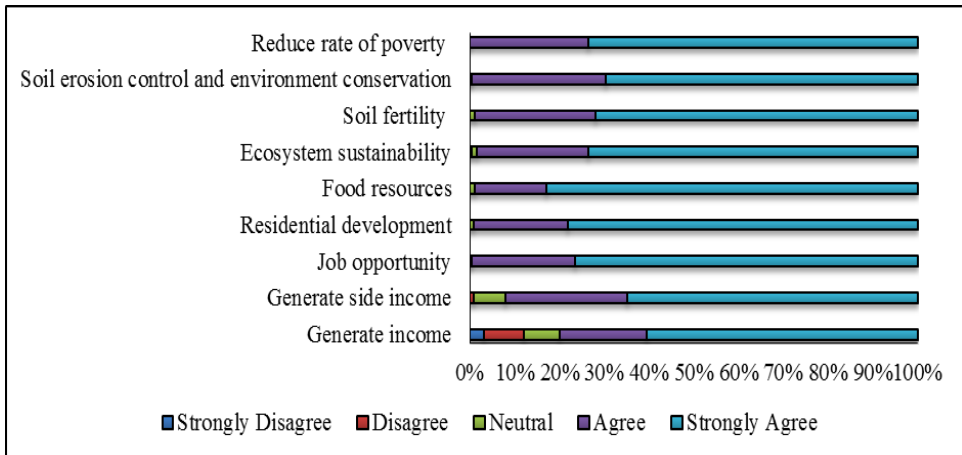


Figure 1. Agroforestry practitioners' insight on the contribution of agroforestry practices towards their socioeconomics development.

### Agroforestry Awareness

Local communities practising agroforestry in Sandakan, which is also located in the same state, Sabah with Merotai Besar were found lacking in understanding of agroforestry systems concepts (Aminuddin *et al.*, 2008). This is because they did not have any formal agroforestry education. Surprisingly, a survey in agroforestry education conducted among professional staffs (top level officers, managerial officers, field officers) in agro-based agencies resulted in more than half of these professionals never had agroforestry education (Azmy *et al.*, 2013). Professionals working in agro-based agencies had perceived the low numbers of staff that had taken agroforestry education because it was not strongly emphasized at tertiary level education in Malaysia, as job opportunities were low.

Not surprisingly, almost all agroforestry practitioners in Merotai Besar lack awareness that they are practicing agroforestry activities. Only 17 respondents understood agroforestry practices (Figure 2a). Most of the respondents have never heard the word "*agroforestry*" which clearly indicates that respondents' knowledge of agroforestry is very limited. The main reason might be they had less exposure of agroforestry knowledge due to their education level (Table 1).

Sharing and transferring of knowledge is very important for making successful awareness programs to community (Hudcova, 2014). In consideration of the education and socioeconomic background of the local communities in Merotai Besar must also be taken account of the best strategies to increase the level of agroforestry awareness (Mohd. Hamdan *et al.*, 2017). Campaign is one of the ways to improve communities understanding and enhance knowledge on agroforestry practices. It will be more difficult for the professionals to transfer the knowledge and educate the rural community due to lack of agroforestry education themselves (Azmy *et al.*, 2013). Therefore, the government should

acknowledge this issue and train agroforestry related professionals for successful dissemination of agroforestry practices among potential communities.

In Sandakan District, Sabah there is six types of agroforestry systems that were practised in smallholders' farm: agrosilvicultural, agrisilvicultural, agrosilvopastoral, aqua-agrosilvicultural, silvopastoral, and aqua-agrisilvicultural (Aminuddin *et al.*, 2008). Sabah is a centre of biodiversity hotspot reflected by major tree/crop components in agroforestry practice area makes agrosilvicultural is the main system being practised (Mohd. Nazip *et al.*, 2000). The agroforestry education is very important to sustain agroforestry practices in Malaysia due to lack of successful models, constraint to make right species selection and diversion of resources (Awang Noor *et al.*, 2010). Nevertheless agroforestry systems may vary according to the location of agroforestry activities that is being practiced by the local communities in certain areas. In Merotai Besar, agrisilvicultural system is the most agroforestry systems that were practised by agroforestry practitioners followed by agrosilvopastoral system and silvopastoral system (Figure 2b).

Agrisilvicultural were more applied by the agroforestry practitioners in Merotai Besar because it can increase the source of income and more practical to manage compared to the other systems (Table 1). The application of agrisilvicultural system by local communities in this area emphasized more on the planting of woody trees together with crops without any livestock. On the other hand, the management of the agrosilvopastoral system is more difficult to sustain because livestock has the potential to damage the crops in certain areas (Gutteridge & Sheldon, 1994).

Popular combination of crops such as rubber trees and crops like vegetables were observed in Merotai Besar. The main function of the tree is to provide natural shading to the crop as well as to avoid soil erosion because of the tap root's crops can hold the soil stronger than the fibrous root's crops (Simons, 1992). Merotai Besar local communities strongly agreed by practicing agroforestry systems has helped in preventing soil erosion and sustained soil fertility (Figure 1).

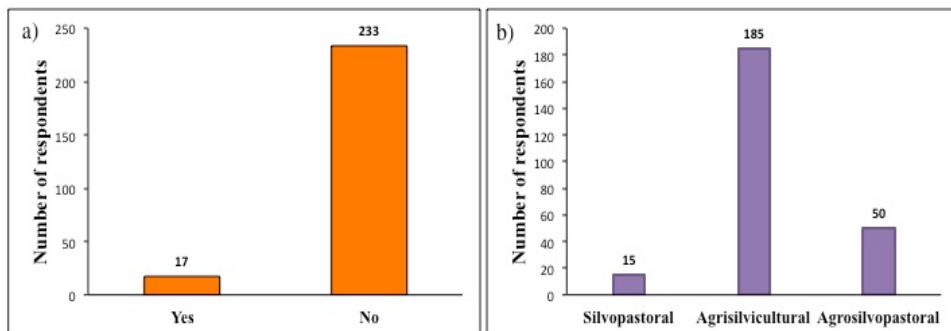


Figure 2. a) Agroforestry systems awareness of respondents; b) Agroforestry systems that is being practiced in Merotai Besar.

## CONCLUSIONS

This study offers findings that can explain the linkages between knowledge at rural communities' levels and agroforestry activities, with references to agroforestry in Malaysia. Local communities in rural areas have low education that obstructed them for a better understanding of agroforestry systems as holistic even generally they are practicing the agroforestry activities. Poor dissemination of agroforestry information and lack of awareness within rural communities in relation towards agroforestry practices could influence community's socioeconomics. Therefore, the involvement of active community-based management practices among respective villages plays an important role for sustainable economic development.

Knowledge of the contribution of agroforestry practices in rural area is crucial for maintaining sustainability and future improvement of agroforestry practices.

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