Case Study

Multidimensional Poverty Index of Marginalized Orang Asli in Terengganu, Malaysia

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ABSTRACT

The general interpretation of poverty line index (PLI) is the measurement of poverty in Malaysia. However, by using this unidimensional poverty approach, it does not truly reflect the status of those who are poor. It is only confined to addressing the income or expenses debate, which does not reflect the actual living standards of the poor. Therefore, this study introduce the multidimensional poverty index (MPI) as an alternative method of poverty measurement. MPI is capable of identifying "Who is Poor" among the underprivileged in society. This paper aims to bridge the gap between the *Orang Asli* society's development and national policy from a multidimensional perspective. By applying the MPI to the *Orang Asli* population in Terengganu, this study is able to reveal the factors that have deprived the poor to the point of poverty. There are four dimensions used in this study such as education, health, standard of living, and wealth. The result shows 97.1% of the *Orang Asli* in Terengganu is deprived in livestock followed by waste management at 96.6%, years of schooling at 83.4%, and only 58.9% as an income indicator. The result also indicates that Sungai Pergam village is poorer compared to other villages based on the MPI measured. These findings prove that MPI is able to reveal the real

reason behind poverty with accuracy. Therefore, this mode of measurement can also be applied to other targeted groups in order to achieve more effective poverty eradication programs.
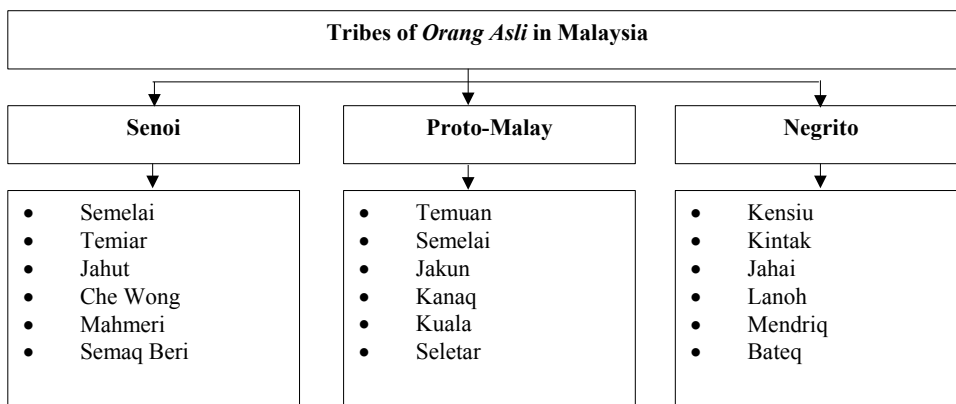
INTRODUCTION

Indigenous people also known as "*Orang Asli*" is a minority group in Malaysia who are unique from other races especially in cultural heritage, religion, socioeconomic, and beliefs. They are often associated with the native habitants whose behavioural pattern is dependent on ancient culture and subsistent socioeconomic living. The *Orang Asli* in Malaysia can only be found in the peninsular. Based on their geographical distribution, language, and morphological characteristics, *Orang Asli* are divided into three major tribes and 18 sub-tribes (Abdullah et al., 2016) (Figure 1). However, they live in a heterogeneous setting because each sub-tribe has their own respective followed trait.

The *Orang Asli* is an aborigines minority group of people who live in a primitive environment with poor health and education services, lack of social development and is the financially disadvantaged community. According to Md Nor (1999), the *Orang Asli* community have a low quality of life as a consequence of being fully reliant on traditional socioeconomic resources. These rural socioeconomic activities lead them to live in isolated and countryside areas that are near to their resources. According to Kamarudin and Ngah (2007), the *Orang Asli* community are fully reliant on forest yields to live which are their regular socioeconomic activity but this places them in a precarious position as they cannot fit into the mainstream chain of

Tribes of *Orang Asli* in Malaysia		
Senoi	**Proto-Malay**	**Negrito**
• Semelai • Temiar • Jahut • Che Wong • Mahmeri • Semaq Beri	• Temuan • Semelai • Jakun • Kanaq • Kuala • Seletar	• Kensiu • Kintak • Jahai • Lanoh • Mendriq • Bateq

Source: Department of Orang Asli Development (JAKOA, 2011)
Figure 1. Orang Asli tribes in Malaysia.

Table 1

Poverty among Orang Asli in Malaysia

Year	Total Head of Household (HoH)	Poverty					
		Poor		Hard Core Poor		Total	
		%	HoH	%	HoH	%	HoH
2000	25,337	39.80	10,085	43.60	11,046	83.40	21,131
2001	26,198	39.80	10,428	41.03	10,749	80.83	21,177
2002	28,476	41.20	11,732	37.88	10,788	79.08	22,520
2003	29,873	41.63	12,435	35.26	10,532	76.88	22,967
2007	27,841	18.00	5,011	32.00	8,909	50.00	13,920
2008	27,841	17.75	4,942	32.34	9,004	50.09	13,946
2009	27,841	33.53	9,335	15.47	4,307	49.00	13,642
2010	36,658	11.19	4,102	19.97	7,321	31.16	11,423

Source: Department of Orang Asli Development (JAKOA, 2011)

activities that churn productivity. Ancient ancestral tradition and culture are the major factors that hampers their initiative to make changes and adapt to a more progressive and developed environment. They still believe in the forest and natural environment as provider for their livelihood. Generally, the *Orang Asli* populations in Malaysia are very poor compared to the mainstream Malay, Chinese, and Indian communities (Table 1).

To eradicate poverty more effectively, a need analysis and a thorough research on poverty should be the best course of action. It has been a precedent to use unidimensional measurement with only one indicator either for income or expenses was used to identify the poor. It is different in the case of multidimensional poverty, which uses several dimensions for the same purpose. This view is reflected in the Malaysian Millennium Development Goals (MDGs)[1] report in 2015, which stated that poverty was multidimensional. It is of course, more than lack of income. Poverty is also associated with lack of access to basic education, health (including reproductive health) services and information, shelter, water clean, and sanitation.

Hence by using multidimensional poverty index (MPI), it could be one measuring method that can be used by policymakers when enacting certain programs related to poverty. Therefore, this research paper is trying to investigate how poverty affects *Orang Asli* by looking at all of the elements that might cause their deprivation. By using MPI that was introduced by Alkire and Foster (2008), with

1. Millennium Development Goals (MDGs) consist of eight international development goals to eradicate poverty across the world. It has been established in the Millennium Summit by United Nation (UN) in 2000. It is currently joined by 193 countries all over the world (United Nation (UN) report, 2015).

the intervention of UNDP and OPHI, these objectives will be attained with accuracy.

Marginalization of *Orang Asli* in Malaysia

Economy plays an important role in affecting the life of a community. According to Yusof (1996), an economy refers to a system that includes productivity, consumption, distribution, and services. However, this marginalised communities especially those who are fully dependent on forest yields such as herbs trees and animals depicting a downturn on development. According to Kamarudin and Ngah (2007), most of the *Orang Asli* are poor because of their dependency on income from forest yields that has been the tradition for years. Generally, they go into the nearby forest to get all the valuable yields and sell them to middlemen. Unfortunately, the *Orang Asli* are always exploited by middlemen. Middlemen will always try to quote the lowest price for the valuable yields from this community and resell these actual valuable yields at a much higher price in the market. As a consequence of this exploitation, the life of the *Orang Asli* will be stagnant with no hope for development thus hampering the objectives of the government. According to Emby (1996), there is a vacuum and discrepancy that do not coincide with their effort as their income is neither stable nor fixed due to the manipulation exercised by the middlemen.

Deforestation of crops and development is the crucial issue for the *Orang Asli* community. Normally, the authorities infiltrated the forest for wood supply and changed it into a secondary forest by planting oil palm and rubber for commercial purpose. Moreover, the destruction of the nearby forest puts the *Orang Asli* in dire straits as they find it difficult in procuring more yields for survival. They have to find another spot in another forest, which is quite a distance from their home. This may lead them to be in the forest for a few days and away from their family during that time. In addition, being located at a far-off forest requires them to rent a vehicle and this will burden them with a high cost.

Education is the most crucial sociological element for the *Orang Asli* that has to be addressed. According to JAKOA (2011), the education achievement of *Orang Asli* is far behind compared to the other races even though there are so many initiatives taken by our government with respect to *Orang Asli* education. For them, formal education is worthless in comparison to survival skills and knowledge of the forest (Hanafi et al., 2014). They normally allow their children to skip school and some children are not even enrolled in school. This situation happens because they never insist on education or place any high ambition on their children. For them, mastery in basic knowledge (reading, writing, and arithmetic) is sufficient. However, most of them have never mastered basic education and they will drop out of school even before completing standard six (Talib & Muslim, 2006).

Health is also one of the identified factors that can be interpreted as a deprivation

indicator. The ratio of death among children as well as malnutrition suffered among pregnant women and children are the most critical issues that are prevalent among these *Orang Asli* community. According to the Freemantle (2010, July), the *Orang Asli* children are often in poor health because of inaccessibility to health services due to the remoteness of their forest dwelling areas. *Orang Asli* normally believe that the surrounding supernatural and traditional medicine can heal them from any illness. According to World Health Organization (WHO, 2007), traditional healing plays a vital role for the *Orang Asli* healing strategy. Almost 80% of them still rely on the traditional healing system as their primary source of healthcare. "Indigenous people remain on margins of society: They are poorer, less educated, die at a younger age, and are much more likely to commit suicide and are generally worse in health than the rest of the population" (Stidsen, 2006). In Malaysia, the *Orang Asli* resettlement area such as in Hulu Gombak offers excellent medical services by the Federal government. The government has built medical clinics with a few medical staff and basic equipment in the resettlement area. These policies have been successful in changing the life of the *Orang Asli* that do not rely on the traditional healing system. Besides, most of them move from the forest to the settlement just to enjoy this medical facility.

The living conditions among the *Orang Asli* are generally poor. It is a norm to live without access to the road, clean water, houses, electricity, sanitation, cooking fuel, home appliances, and waste management. All of these indicators contribute to the poor standard of living. According to JAKOA (2011), in Malaysia, most of the *Orang Asli* moved to the new resettlement areas complete with basic amenities needs such as good house condition with good water quality, electricity, sanitation, road access, and other additional facilities provided by the government. The purpose of this is to reduce the gap between rural communities. However, these aids fail to reach those *Orang Asli* who are still living in the forest.

The Poverty Measurement

Poverty is defined as a situation where there is deprivation and inequality among the poor households, with the low level of income to fulfil their basic needs such as low education level, unemployment, zero property, unhealthy, lack of food and clothing, and without shelter (Dawood & Khoo, 2016). This is a standard definition of poverty and hard-core poverty stated in the Tenth Malaysia Plan (2011–2015) (Government of Malaysia, 2011). It is a precedent to use poverty line (PL) as their main source in measuring poverty. In principle, PL is supposed to determine the level of income to avoid poverty. However, after decades of using this method, there is still an increase in the trend of poverty and hunger (UNDP, 2016). This type of method is called unidimensional. The poverty line is just using income or expenses as their base in measuring poverty. In Malaysia, the measurement of poverty can be seen through poverty line index (PLI). PLI is measured by

looking at the average monthly gross income for the population. Poverty occurred when the monthly household income is below the PLI (Table 2).

There are two types of poverty that can be determined by PLI. They are identified as absolute poverty and relative poverty. Absolute poverty is measured by looking at PLI that is determined by the government policies. However, relative poverty is identified by looking at the discrepancy between two individuals or places. For instance, they are relatively poor when compared to the middle-income group and upper-income group in comparison to the two regions with different socioeconomic development (Othman & Pon, 2005).

There have been few policies that have been implemented by the Malaysian government to eradicate poverty since independence in 1957. The New Economic Policy (NEP) was implemented in 1970 focused on eradicating poverty by creating new job opportunities to increase the household income. It can be seen that the NEP has successfully reduced poverty level from 49.3% in 1970 to 17.1% in 1990 (Government of Malaysia, 1991; Nair,

2000). In 1991 until 2000, NEP has been changed to the National Development Policy (NDP), which still focused on poverty eradication. In the year 2000 until 2010, NDP again was replaced with the National Vision Policy (NVP) and successfully reduced the poverty of *Bumiputra* up to 65% in 2009 (Government of Malaysia, 2011). Most of Malaysia's development plans and policies have been significant to the achievement of social development especially in physical infrastructure, job opportunity, and communication technology (Islam, 2010). In fact, Malaysia has achieved the Millennium Development Goals (MDGs) to eradicate poverty rate before the 2015 target. There are eight goals to be achieved such as eradicating extreme hunger and poverty, achieve universal primary education, promote gender equality and women empowerment, reduce child mortality, improve maternal health, combat HIV/AIDS, malaria and other diseases, ensure environmental sustainability, and develop a global partnership and development. Through Malaysia MDGs, the poverty level had declined from 52.4% in 1970 to 12.4% in 1992 and continued to

Table 2

Poverty line income of Malaysia

Region	Poor (RM/Month)		Hard-core Poor (RM/Month)	
	Household	Per capita	Household	Per capita
Peninsular Malaysia	930	230	580	140
Urban	940	240	580	140
Rural	870	200	580	140

Source: Economic Planning Unit (EPU, 2014)

3.8% in 2009. This positive achievement is part of national strategies in pursuing the new development model and other development policies (United Nation Malaysia, 2016). The launching of New Economic Model (NEM) in 2010 aimed to bring Malaysia as a high-income country. In order to achieve this, there are a lot of strategies that needs to be considered including higher education, good physical infrastructure, good health, low unemployment rate, and high household income (New Economic Advisory Council, 2010). Although there are various improvements in physical features yet, inequality and unevenness still happen across regions where the pocket of poverty in both rural and urban still remains (Dawood & Khoo, 2016).

In order to bridge the gap in poverty measurement, it is important to identify the dimension and indicator of deprivation. Therefore, MPI has to be used. In other words, MPI is complementing PLI measurement in eradicating poverty. Unlike PLI, MPI is poverty measurement that is not only based on income or expenses but also in other dimensions that are important. There are three dimensions that have been used as a UNDP standard to measure MPI poverty globally. They are education, health, and living standard, which are further separated into 10 other indicators according to the Millennium Development Goals (MDGs) (Table 3). However, a country is allowed to add more or change the variables to determine its own poverty measurement outlook.

PLI, which is using only one variable, does not give accurate picture in identifying the poor. According to Alkire and Santos (2009), there is a limitation in unidimensional poverty measurement. They believed income and consumption were not the only factors that were reflected in the poverty

Table 3

Dimension and indicator for UNDP global standard measurement

No.	Dimension	Indicator
1.	Education	Years of schooling
		School enrolment/attendance
2.	Health	Child mortality
		Nutrition
3.	Standard of Living	Electricity
		Drinking water
		Sanitation
		Flooring
		Cooking fuel
		Asset

Source: United Nation Development Program (UNDP, 2016)

measurement. Besides, it only determines deprivation at the household level and not on the resources among the household. Meanwhile, Alkire and Seth (2015) had identified several advantages when using the method proposed by Alkire and Foster (2008), in estimating the multidimensional poverty and identifying the poor. Alkire and Foster (2008) indicated that the dimensions and indicators used were not related to each other. It made them independent and a standalone dimension, which was not influenced by others. This approach is also free to be given the same or different weightage to every dimension chosen. It is robust in identifying the poorest among the poor by increasing the breakdown aggregate. It is also beneficial in determining the crucial dimension that is reflected to the poverty in the region or among the society. Therefore, this paper aims to bridge the gap between the *Orang Asli* society's development and national policy from a multidimensional perspective. By applying the MPI to the *Orang Asli* population in Terengganu, this study is able to reveal the factors that have deprived the poor to the point of poverty. The finding of this study is important to help the government agencies in identifying correct aids to fulfil the needs of *Orang Asli*.

METHOD

Participant

This study was conducted at the *Orang Asli* resettlement area in Terengganu, Malaysia where Semaq Beri tribe lives. In this study, primary data had been collected by distributing questionnaires among the head of households (HoHs). The data collection process was assisted by JAKOA officers based on the name list recorded. The study population was from the three (3) *Orang Asli* resettlement areas in Terengganu, (1) Sungai Berua village, Hulu Terengganu, (2) Sungai Pergam village, Kemaman, and (3) Sungai Sayap village, Besut. As HoH is the target respondent in this study, the population number of HoH is only 243. However, due to constrain (as respondent refused to be interviewed), this study managed to get 241 respondents (the response rate is 99%). There were 93 respondents from Sungai Berua village, 140 respondents from Sungai Berua village and other eight respondents were in Sungai Sayap village (Table 4).

Table 4

Distribution of Orang Asli in Terengganu

| District | Village | Tribe | Respondent (HoH) | Total | | |
				Head of Household (HoH)	Household (H)	Population
Kemaman	Sungai Pergam	Semaq Beri	140	140	543	683

Table 4 *(Continued)*

| District | Village | Tribe | Respondent (HoH) | Total | | |
				Head of Household (HoH)	Household (H)	Population
Hulu Terengganu	Sungai Berua	Semaq Beri	93	95	510	605
Besut	Sungai Sayap	Bateq	8	88	30	38
Total			241	243	1083	1326

Source: Author research finding (2017)

Instrument

The questionnaire used was adapted from the United Nation Development Program of Malaysia (UNDP). The answers were recorded using the binary method, which is "1" as deprived and "0" as not deprived. The data were analysed using the multidimensional analysis.

MPI Poverty Measure

Alkire and Foster (2011) introduced MPI as a new alternative to measure poverty level. However, this method is not practical for continuous data. It is preferred for categorical or ordinal data for robust measurement. This method is intuitively applied as shown in Figure 2.

The MPI value is the product of multidimensional headcount ratio and the intensity of poverty. The headcount ratio (H) is the proportion of the population of the population who are multidimensionally poor:

$$H \frac{q}{n}$$

where q is the number of people who are multidimensionally poor and n is the total number of the population. The intensity of poverty (A) reflects the proportion of the weighted indicator measured (d) in which on average poor people are deprived in. A is measured by:

$$A = \frac{\sum_1^q c}{qd}$$

where c is the total number of weighted deprivations and d is the total number of indicators.

In measuring MPI, the researcher needs to have own justification in deciding the suitable dimension and indicator that can be used (Alkire, 2007). Even though, there are three dimensions with 10 indicators used by UNDP for global MPI measures, it can be different in other countries. For example, America has used MPI by looking at four dimensions with eight indicators and India has used three dimensions with 10 indicators (UNDP, 2016). In Malaysia, there was a study done by Che Mat et al. (2012) that used four dimensions with 14 indicators to

measure the MPI on the rural community in Baling, Kedah, Malaysia. As such, with suitable modification from the past research, this study used four dimensions with 17 indicators as MPI measurement for *Orang Asli* in Terengganu (Table 5).
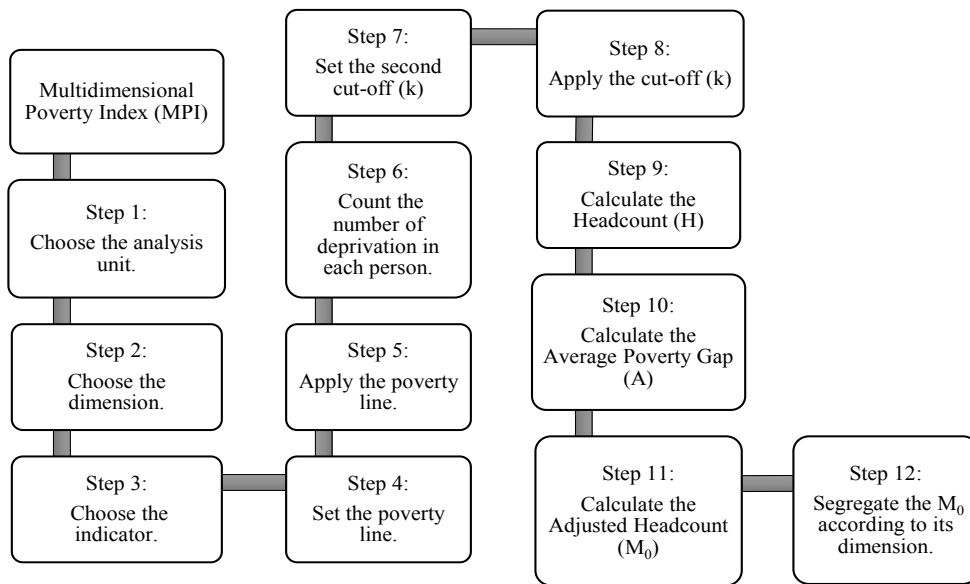
Source: Alkire and Foster (2011)

Figure 2. Twelve steps in measuring multidimensional poverty index (MPI)

Table 5

Dimension and indicator for MPI measurement

No.	Dimension	Indicator
1.	Education	i. Year of schooling
		ii. Child enrolled
2.	Health	iii. Mortality rate
		iv. Nutrition
3.	Standard of Living	v. Electricity
		vi. Sanitation
		vii. Clean water
		viii. Type of houses
		ix. Type of cooking fuel
		x. Home appliances

Table 5 *(Continued)*

No.	Dimension	Indicator
3.	Standard of Living	xi. Number of household
		xii. Road Access
		xiii. Waste management
		xiv. Electricity
4.	Wealth	xv. Asset
		xvi. Income
		xvii. Livestock

RESULTS AND DISCUSSION

The results are analysed using two methods. MPI was calculated with and without weightage. Figure 3 shows the seventeen indicators (17) of MPI (without weightage) calculated for the *Orang Asli* household, ranging from livestock (wealth dimension) to mortality (health dimension). The higher the percentage, the more they are deprived of those indicators. The three (3) top indicators that *Orang Asli* household were deprived of are livestock (such as cattle, goats and poultry), waste management and years of schooling, 97.1%, 96.7%, and 83.4%, respectively. Hence, they did not get any economic return from livestock. Waste management is also very poor that indirectly would affect their living condition. Years of schooling reflects the high drop-out rates among *Orang Asli* children. A large number of them did not complete primary education. The findings are consistent with the study done by Abdullah (2014). Generally, they have good access to basic amenities, such clean water, electricity, and road access. Health dimensions (nutrition and child mortality) are found to be decent. This could be due to the facilities and infrastructure provided by the government through the Regrouping Plan (RPS) of *Orang Asli* in this region with the objective of enhancing their well-being.

The policies and strategies for eradicating poverty are crucial issues. Conceptually, the context of poverty in Malaysia used to identify the poor by only looking at income or expenses (unidimensional) of the household. In practice, this study has proven that there are other important factors that have also influenced the level of poverty besides the unidimensional indicator. This is also in line with the concept recognized by MDGs that used various dimensions to justify the level of poverty in the society. In addition, this result also shows that *Orang Asli* in Terengganu is still lagging behind despite many efforts to achieve the NEM implemented by the government.

The following analysis is to examine the total number of indicators grouped together (combination of any indicators listed in Figure 3). One (1) implies they are deprived from a total of one indicator and the maximum number of indicators that they could be deprived from is nine (9) as shown in Figure 4. Approximately

34% of the *Orang Asli* was deprived from a total of six (6) indicators and 27.4% from five (5) indicators as shown in Figure 4. Approximately 19% of the *Orang Asli* under study was deprived from four (4) or less number of indicators.

Figures 3 and 4 only looked at the household deprivation on dimensions and indicators. However, in determining the poor in multidimensional approach, aggregate cut-off point is required. The cut-off point is a minimum point to determine
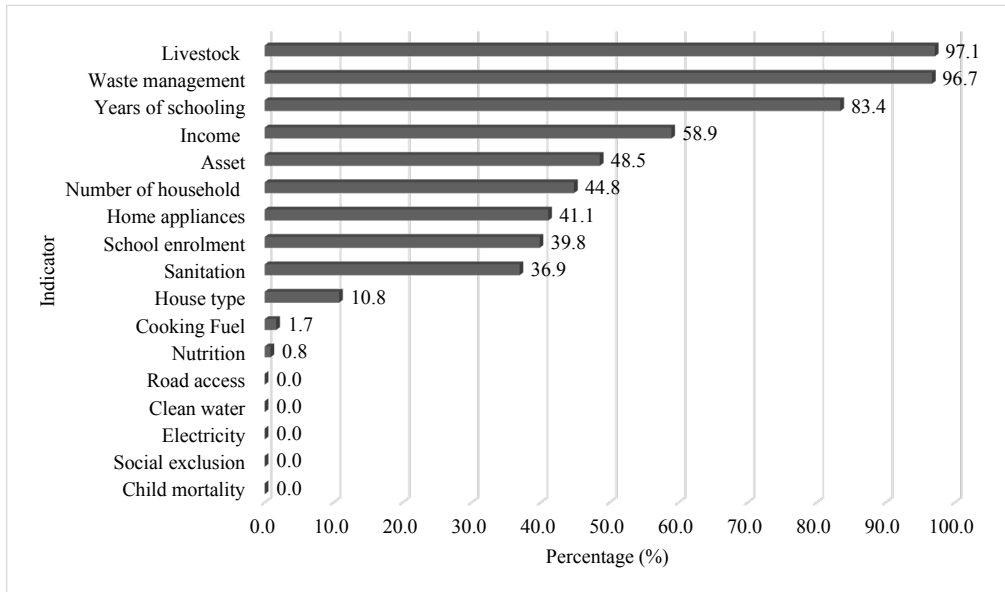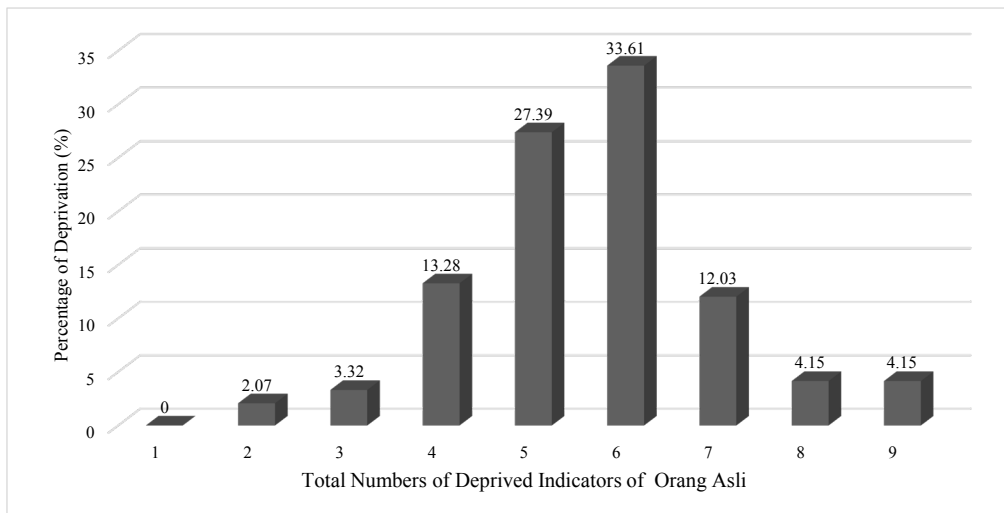

Figure 3. Percentage of deprivation indicator

Figure 4. Percentage distribution of *Orang Asli* by number of deprived indicators

the poor. The cut-off in this paper is set at six (6) based on the highest percentage of the total number of indicators deprived (Figure 4, 33.61%). Thus, the household needs to be at least deprived on six (6) or more indicators to be categorized under multidimensional poor group.

Table 6 indicates the aggregated multidimensional poverty of *Orang Asli* in Terengganu based on different cut-off values. If six (6) indicators are taken as the cut-off point ($k = 6$), this implies that 53.9% of the *Orang Asli* household that are under the multidimensional poverty line. Likewise, if seven (7) indicators are taken as the cut-off point ($k = 7$), 20.3% of *Orang Asli* household is under the multidimensional poverty line. Whereas, when eight (8) indicators are taken as our cut-off ($k = 8$), 18.3% of the *Orang Asli* households are under the multidimensional poverty line. It is the same if nine (9) indicators are taken as cut-off ($k = 9$), 4.1%

of *Orang Asli* household categorized as multidimensional poor. In, summary, the higher the value of cut-off (k) the lower will be the percentage of *Orang Asli* households under the multidimensional poor.

In order to know how multidimensional poor *Orang Asli* in Terengganu is, the value of adjusted headcount ratio (M_0) has to be taken. If $k = 6$, the value of M_0 is 0.210. This means, the MPI for *Orang Asli* in Terengganu is 21%. The value of M_0 will decrease whenever cut-off value increased. The lowest M_0 recorded if it comes to the highest cut-off value. Average poverty gap (A) shows the average of deprivation faced by *Orang Asli* household. If $k = 6$, 38.9% of indicator deprived by *Orang Asli* household. The value of A will be increased if cut-off value is increased. If it comes to the highest cut-off value, there are more indicators deprived compared to the least cut-off value. The higher the value of the cut-off point, the lower is the level of poverty.

Table 6

Aggregated multidimensional poverty

Cut-off (k)	Headcount Ratio (H)	Average Poverty Gap (A) (A=M_0/H)	Adjusted Headcount, (M_0) (H x A)
k=1	1.000	0.330	0.330
k=2	1.000	0.330	0.330
k=3	0.979	0.334	0.327
k=4	0.946	0.340	0.321
k=5	0.813	0.357	0.290
k=6	0.539	0.389	0.210
k=7	0.203	0.448	0.091
k=8	0.083	0.500	0.041
k=9	0.041	0.529	0.022

Poverty among the Resettlement Villages

In-depth analysis has been done for the three (3) *Orang Asli* resettlement villages in Terengganu to look at the level of their multidimensional poverty. The villages are Sungai, Berua, Sungai Pergam, and Sungai Sayap. For this purpose, research only used four (4) selected cut-off points as previous analyses ($k = 6$ to $k = 9$). Obviously, Table 7 shows that Sungai Pergam has the highest household poverty ratio in every cut-off level compared to other villages. It is proven if $k = 6$, 67.9% of household in Sungai Pergam are multidimensional poor compared to 35.5% in Sungai Berua and 25% in Sungai Sayap. The highest value of household poverty ratio in Sungai Pergam remains whenever cut-off increased compared to other villages. Besides, the study also precisely found that Sungai Pergam is the most multidimensional

poor compared to others. It is proven when Sungai Pergam has the highest value in adjusted headcount ratio (M_0) in every cut-off level. If $k = 6$, the value of M_0 is 27.1% compared to 12.8% in Sungai Berua and 8.8% in Sungai Sayap. This highest M_0 value in Sungai Pergam remains whenever cut-off increased compared to other villages. Whereas, if $k = 8$ and $k = 9$, only Sungai Pergam still has the M_0 value which 7.1% and 3.8% each.

Weighted Multidimensional Poverty

In calculating MPI, the researcher has the option to set the weighted value to the dimension. In doing this however, the importance of the selected dimension must be considered. For instance, by giving more weighted value in education and health indicators, these indicators are considered to be the most important to be assessed

Table 7

Poverty ratio in each Orang Asli resettlement village

Cut-off, (k)	Village	Headcount Ratio, (H)	Average Poverty Gap, (A)	Adjusted Headcount, (M_0)
	Sungai Berua	0.355	0.362	0.128
$k = 6$	Sungai Pergam	0.679	0.399	0.271
	Sungai Sayap	0.250	0.353	0.088
	Sungai Berua	0.054	0.412	0.022
$k = 7$	Sungai Pergam	0.314	0.452	0.142
	Sungai Sayap	0.000	0.000	0.000
	Sungai Berua	0.000	0.000	0.000
$k = 8$	Sungai Pergam	0.143	0.500	0.071
	Sungai Sayap	0.000	0.000	0.000
	Sungai Berua	0.000	0.000	0.000
$k = 9$	Sungai Pergam	0.071	0.529	0.038
	Sungai Sayap	0.000	0.000	0.000

compared to others. In order to get an accurate MPI value by giving different weighted value for different indicators, recalculation is needed.

Table 8 shows the different weighted values for different dimensions. They are calculated by using the number of indicators measured within the dimensions. For instance, in this study, there are four (4) dimensions known as education, health, standard of living, and wealth where each of them are represented by one-quarter (1/4). When calculating education dimension, for example, there are two (2) indicator set: children enrolment and years of schooling. As such, one-quarter (1/4) represented by education dimension has to be divided

by two (2), which equals to 1/8 for each indicator $[(1/4)/2 = 1/8]$. In order to have the weighted value, the number of indicators in this study (represented by 17) and the denominator value of 1/8 also have to be considered. The weighted value is calculated by rationalizing both value $[(17/8) = 2.125]$. Therefore, the weighted value for each indicator in education dimension is 2.125. Similar calculation is applied to other dimensions. The weighted value for education and health is 2.215; 0.425 for standard of living; and 1.42 for wealth. The total weighted value has to be same with the number of indicator measured in this study which is 17.

Table 8

Weighted value for each indicator

No.	Indicator	Weighted
1.	Children enrolled	2.125
2.	Years of schooling	2.125
3.	Nutrition	2.125
4.	Child mortality	2.125
5.	Community	0.425
6.	Electricity	0.425
7.	Sanitation	0.425
8.	Clean water	0.425
9.	Type of houses	0.425
10.	Type of kitchen	0.425
11.	Appliances	0.425
12.	No. of household	0.425
13.	Road access	0.425
14.	Waste	0.425
15.	Asset	1.42
16.	Income	1.42
17.	Livestock	1.42
Total Weight		17.00

Table 9 shows the weighted multidimensional poverty of *Orang Asli* in Terengganu with four (4) different cut-off values ($k = 6$ to $k = 9$). Generally, the percentage of *Orang Asli* household who is under the poverty line will be decreased whenever the cut-off values are increased. If $k = 6$, there is 53.9% of *Orang Asli* household who are under poverty line. It is followed by 20.3% if $k = 7$, 8.3% if $k = 8$ and 4.1% if $k = 9$.

Table 9 also shows the MPI value for *Orang Asli* in Terengganu with four different cut-off values ($k = 6$ to $k = 9$) as PLI. If $k = 6$, the MPI value for *Orang Asli* in Terengganu is 24.8%. This value will be decreased whenever cut-off values increased. It is proven if $k = 7$, the MPI value is 10.3%. It is followed by 4.3% if $k = 8$ and 2.3% if $k = 9$.

An in-depth analysis has been done to get weighted multidimensional poverty for *Orang Asli* resettlement villages in Terengganu. Generally, Table 10 shows that Sungai Pergam has the highest percentage of under poverty line household in all cut-off level. If $k = 6$, 67.9% of *Orang Asli* household in Sungai Pergam who are multidimensional poor. It is followed by 35.5% of *Orang Asli* household in Sungai Berua and 25% in Sungai Sayap. While, if $k = 7$, 31.4% of *Orang Asli* household in Sungai Pergam who are multidimensional poor and followed by 5.4% in Sungai Berua. However, there is no poverty recorded in Sungai Sayap in this cut-off level. Whereas, if $k = 8$ and $k = 9$, only Sungai Pergam still has household poverty that contributes by 14.3% and 7.1% each.

Table 10 also showed the MPI value by looking at adjusted headcount ratio (M_0). Obviously, Sungai Pergam has the highest MPI value in every cut-off level compared to other villages. If $k = 6$, 32.1% MPI value recorded. It is followed by 15% for Sungai Berua and 11% for Sungai Sayap. While, if $k = 7$, 16% MPI value recorded in Sungai Pergam and followed by 2.7% for Sungai Berua. Meanwhile, there is no MPI value recorded in Sungai Sayap in this cut-off level. Whereas, if $k = 8$ and $k = 9$, only Sungai Pergam still has the MPI value which contributes by 7.5% and 3.9% each.

The results show that, there are poverty disparities between *Orang Asli* resettlement villages in Terengganu by looking at the computed MPI. Although government have given equal physical development through the Regrouping Plan (RPS) including road access, clinic, water supply, electricity, houses and school, poverty disparities still occurr among *Orang Asli* in Terengganu.

Table 9

Weighted multidimensional poverty

Weighted Estimate	$k = 6$	$k = 7$	$k = 8$	$k = 9$
Headcount Ratio (H)	0.539	0.203	0.083	0.041
Average Poverty Gap (A)	0.459	0.506	0.524	0.547
Adjusted Headcount(M_0)/ MPI	0.248	0.103	0.043	0.023

Table 10

Weighted multidimensional poverty in each Orang Asli resettlement village

Cut-off	Village	Headcount Ratio (H)	Average Poverty Gap (A)	Adjusted Headcount (M_0)/MPI
	Sungai Berua	0.355	0.422	0.150
$k = 6$	Sungai Pergam	0.679	0.472	0.321
	Sungai Sayap	0.250	0.439	0.110
	Sungai Berua	0.054	0.494	0.027
$k = 7$	Sungai Pergam	0.314	0.508	0.160
	Sungai Sayap	0	0	0
	Sungai Berua	0	0	0
$k = 8$	Sungai Pergam	0.143	0.524	0.075
	Sungai Sayap	0	0	0
	Sungai Berua	0	0	0
$k = 9$	Sungai Pergam	0.071	0.547	0.039
	Sungai Sayap	0	0	0

CONCLUSION

In conclusion, MPI measurement implemented in this study has successfully covered the objectives of the studies. The results found that most *Orang Asli* in Terengganu was critically deprived in commercial livestock, waste management followed by years of schooling and income indicator. Yet, there are other indicators that are of concerned such as asset, number of households, home appliances, school enrolment, and sanitation which have less than 50% deprivation. However, despite these findings, this study also proves that government has improved the quality of lives of *Orang Asli* in Terengganu due to the least deprivation ratio found especially in nutrition, road access, clean water, electricity, social exclusion, and child mortality indicator. Besides, this study clearly indicates that Sungai Pergam village in Kemaman is poorer compared to other villages based on the MPI measured.

More important, this study shows that MPI measurement is a better alternative method to elucidate how poor the community is by not only factoring income or expenses but also by using non-monetary dimensions such as education, health, standard of living, and wealth. The aim is to focus on poverty reduction by the public socioeconomic framework, which is efficient in bridging the social gap. By using MPI, the study does not only comprehend the significant level of poverty but also identify the indicator that contributes to poverty specifically. Therefore, MPI measurement can be implemented to other *Orang Asli* sub-ethnic groups in other regions in Malaysia. It is vital for management authorities to have

comprehensive data in order to identify suitable kind of aids to be given to extremely poor *Orang Asli* community.

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REFERENCES

Abdullah, M. T., Abdullah M. F., Bartholomew, C. V., & Jani, R. (2016). *Kelestarian masyarakat Orang Asli Terengganu* [The sustainability of Orang Asli in Terengganu]. Kuala Terengganu, Malaysia: Universiti Malaysia Terengganu.

Abdullah, R. (2014). *Orang Asli: Pembangunan dan transformasi* [Orang Asli: Development and transformation]. Kuala Terengganu, Malaysia: Universiti Sultan Zainal Abidin.

Alkire, S. (2007). The missing dimensions of poverty data: Introduction to the special issue. *Oxford Development Studies*, *35*(4), 347–359.

Alkire, S., & Foster, J. (2008). *Counting and multidimensional poverty measurement* (OPHI working paper Series: 7). Retrieved June 22, 2017, from https://www.ophi.org.uk/wp-content/uploads/ophi-wp7_vs2.pdf.

Alkire, S., & Foster, J. (2011). Counting and multidimensional poverty measurement. *Journal of Public Economics*, *95*(7-8), 476-487.

Alkire, S., & Santos, M. E. (2009). Poverty and inequality measurement. In S. Deneulin & L. Shahani (Eds.), *An introduction to the human development and capability approach* (pp. 121–161). London, England: Earthscan.

Alkire, S., & Seth, S. (2015). Multidimensional poverty reduction in India between 1999 and 2006: Where and how? *World Development*, *72*, 93-108.

Che Mat, S. H., Hakim, R. A., & Jumali, S. N. (2012). Indeks kemiskinan pelbagai dimensi sebagai alternatif pengukuran kemiskinan: Kajian kes di daerah Baling, Kedah [Alternative poverty measurement Using multi-dimensional poverty index in the district of Baling, Kedah]. *Jurnal Ekonomi Malaysia*, *46*(1), 3-12.

Dawood, S. R. S., & Khoo, S. L. (2016). Poverty eradication, government role and sustainable livelihood in rural Malaysia: An empirical study of community perception in northern Peninsular Malaysia. *Geografia-Malaysian Journal of Society and Space*, *12*(8), 61-70.

Department of Orang Asli Development. (2011). *Pelan strategik kemajuan orang asli 2011-2015* [Strategic Plan of Orang Asli development 2011-2015]. Kuala Lumpur, Malaysia: Bahagian Perancangan dan Penyelidikan Jabatan Kemajuan Orang Asli.

Economic Planning Unit. (2014). *Risalah perangkaan pendapatan dan kemiskinan isi rumah sepintas lalu, 2012 dan 2014* [A brief of statistic prospectus of household income and poverty, 2012 and 2014]. Kuala Lumpur, Malaysia: Economic Planning Unit.

Emby, Z. (1996). *Laporan kajian rancangan pengumpulan semula: Kesannya ke atas masyarakat dan budaya Orang Asli di Perak* [The report of resettlement plan: The effect

towards community and culture of Orang Asli]. Serdang, Malaysia: Universiti Pertanian Malaysia.

Freemantle, J. (2010, July). Indigenous children: Their human rights, mortality and millennium development goals. *The Magazine of the United Nations*. Retrieved July 20, 2017, from https://unchronicle.un.org/article/indigenous-children-their-human-rights-mortality-and-millennium-development-goals.

Government of Malaysia. (1991). *Second outline perspective plan, 1991-2000*. Kuala Lumpur, Malaysia: Government Printers.

Government of Malaysia. (2011). *Tenth Malaysia Plan, 2011-2015*. Kuala Lumpur, Malaysia: Government Printers.

Hanafi, W. A. W., Ahmad, S., & Ali, N. (2014). Faktor budaya dan persekitaran dalam prestasi pendidikan anak Orang Asli Malaysia: Kajian kes di Kelantan [Culture and environment factors in the educational performance of Malaysian aboriginal children: A Kelantan case study]. *Geografia: Malaysian Journal of Society and Space*, *10*(5), 107-122.

Islam, R. (2010). Critical success factors of the nine challenges in Malaysia, vision 2020. *Socio-Economic Planning Sciences, 44*, 199-211.

Kamarudin, K. H., & Ngah, I. (2007). *Pembangunan mapan Orang Asli* [The sustainability of Orang Asli]. Kuala Lumpur, Malaysia: Universiti Teknologi Malaysia.

Md Nor, N. Z. (1999). *Peranan Jabatan Hal Ehwal Orang Asli dalam perubahan sosio-ekonomi masyarakat Orang Asli: Kajian kes terhadap suku Semai di Pos Dipang, Sahom, Kampar, Perak* (Unpublished Doctoral dissertation), University of Malaya, Kuala Lumpur, Malaysia.

Nair, S. (2000). *The Malaysian economy: Challenges for Malaysia*. Paper presented at in 2nd Biennial Aotheoroa, New Zealand on International Development Studies Network Conference: Prosperity, Poverty and Progress, Victoria University of Wellington, Wellington, New Zealand.

New Economic Advisory Council. (2010). *New economic model for Malaysia: Part 1: strategic policy directions*. Putrajaya, Malaysia: National Economic Advisory Council.

Othman, Z., & Pon, Y. (2005). *Pengantar teori pembangunan dunia* ketiga [An introduction of third world development theory]. Sintok, Malaysia: Penerbit Universiti Utara Malaysia.

Stidsen, S. (2006). *International working group on indigenous affairs (IWGIA): The indigenous world 2006*. Copenhagen, Denmark: Eks-Skolens Trykkeri.

Talib, J., & Muslim, N. (2006). Bagaimana kanak-kanak Orang Asli gagal di sekolah? [Poor performance of Orang Asli children at school?]. *MALIM: Jurnal Pengajian Umum Asia Tenggara*, *8*, 51-76.

United Nations Development Program. (2016). *Human development report: Multidimensional poverty index (MPI)*. New York, USA: Lowe-Martin Group.

United Nations Malaysia. (2016). *Malaysia millennium development goals report 2015*. Kuala Lumpur, Malaysia: United Nations Malaysia.

United Nations. (2015). *The millennium development goals report 2015*. New York, USA: United Nations.

World Health Organization. (2007). Health of indigenous people. *World Health Organization Media Centre*. Retrieved July 20, 2017, from http://www.who.int/mediacentre/factsheets/fs326/en/

Yusof, R. (1996). *Asas sains sosial dari perspektif sosiologi* [The fundamental of social sciences from sociology perspective]. Kuala Lumpur, Malaysia: Dewan Bahasa dan Pustaka.