

# Differences Between Monetary and Multidimensional Poverty in the Lao PDR: Implications for Targeting of Poverty Reduction Policies and Interventions

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## Abstract

This study compares monetary and multidimensional poverty measures for the Lao People's Democratic Republic. Using household data of 2007/2008, we compare the empirical outcomes of the country's current official monetary poverty measure with those of a multidimensional poverty measure. We analyze which population subgroups are identified as poor by both measures and thus belong to the category of the poorest of the poor; and we look at which subgroups are identified as poor by only one of the measures and belong either to the category of the income-poor (identified as poor only by the monetary measure) or to that of the overlooked poor (identified as poor only by the multidimensional poverty measure). Furthermore, we examined drivers of these differences using a multinomial regression model, and found that monetary poverty does not capture the multiple deprivations of ethnic minorities, who are only identified as poor when using a multidimensional poverty measure. We conclude that complementing the monetary poverty measure with a multidimensional poverty index would enable more effective targeting of poverty reduction efforts.

*Keywords:* Laos, poverty measurement, Sustainable Development Goals, capabilities

## Introduction

Debates on the definition, conceptualization, and measurement of poverty are proliferating, not least as a consequence of the adoption of Agenda 2030, which aims at eradicating poverty entirely within the next 15 years. Three major poverty concepts have dominated these debates to date. They are based on ideas of subsistence (Booth 1902; Rowntree 1901), basic needs (Hicks & Streeten 1979; Stewart 1985), and relative deprivations of resources, capabilities, and rights (Townsend 1979; Nussbaum & Sen 1993; Wolff & De-Shalit 2013). The operationalization outcomes of these poverty approaches can be grouped into monetary (or consumption-based) and multidimensional poverty measures (Laderchi, Saith et al. 2003). While monetary definitions of poverty refer to measurements based on income or/and expenditure, multidimensional poverty measures take account of a broader range of goods and services that are assumed to characterize an individual's well-being. To date, monetary measures are still the most widely used approach to poverty analysis worldwide (Laderchi, Saith et al. 2003). However, there is increasing debate in the literature about the conceptual and methodological shortcomings of monetary measures and the need for alternative and complementary approaches that go beyond the normative economic goal of satisfying needs and desires (Alkire 2005). This debate was fueled by evaluations of the Millennium Development Goals (MDGs) (Vandemoortele 2011; Karver, Kenny et al. 2012) which revealed that although the goal of halving the population living on less than USD 1.25 a day was achieved, social inequalities remained stable or increased. This raised the question of whether ending poverty defined as living on less than USD 1.25<sup>1</sup> a day is an adequate goal for the post-2015 development agenda.

The main criticism of monetary poverty refers to the implicit assumption that income functions as a means to bring about individual achievements. Some researchers argue that not all goods and services can be purchased on markets (Tsui 2002; Bourguignon & Chakravarty 2003; Thorbecke 2007) or assigned a monetary value (Thorbecke 2007; Hulme and McKay 2008). Moreover, Thorbecke (2007) argues that even if individuals or households have sufficient income to meet their basic needs, this is not necessarily what they decide to spend it on.

Scholars have responded to the conceptual and technical disadvantages of monetary poverty measures by developing alternative approaches to poverty measurement. One of the most powerful concepts draws on the seminal work of the Indian economist Amartya Sen (1976, 1980). Sen's capability approach is designed in a way that makes it possible to capture multiple dimensions of poverty (Atkinson 2003; Bourguignon & Chakravarty 2003; Duclos, Sahn et al. 2006; Alkire & Foster 2011; Alkire & Santos 2010; Bennett & Mitra 2013). Instead of focusing on the distribution of resources such as money, land, or food, multidimensional approaches are concerned with the distribution of individuals' effective abilities to achieve important and worthwhile goals (Kelleher 2013). This marks a major change in the debate on poverty assessment and has been important in shedding light on some of the negative consequences or "costs" of modernization processes. In other words, not only did some people miss out on benefits of "development", but the situation of some groups is actually deteriorating (Rigg 2015). The monetary approach disregards differences between individuals in their ability to convert income into achievements. Sen argues that it is a theoretical mistake to be concerned with goods rather than with what these goods do for human well-

being. His concern is more commonly known in terms of “means versus ends”. In a well-known example, Sen (1980) compares a disabled person with someone nondisabled: even if they have access to equivalent bundles of resources, the disabled person will likely find it harder to achieve important and worthwhile goals than the nondisabled person.

A growing body of empirical literature focuses on differences between the empirical outcomes of monetary and multidimensional approaches (Maltzahn & Durrheim 2007; Ataguba, Ichoku et al. 2013; Roelen & Notten 2013; Levine, Muwonge et al. 2014; Kahn, Hussain et al. 2015). These studies show that monetary poverty is weakly correlated with other dimensions of poverty and is therefore not an appropriate proxy for people’s diverse experiences of poverty. For example, Ataguba et al. (2013) found that over 62% of individuals living in Nussaka, Nigeria, on more than USD 1.25 a day are classified as poor using different measures of multidimensional deprivation. This raises the following questions: “What is the relationship between deprivation indicators and household income, how is that to be interpreted, and what conclusions can be drawn?” (Nolan & Whelan 2011: 31).

To our knowledge, only few studies so far have analyzed factors and dynamics underlying differences between monetary and multidimensional poverty measures. For example, Roelen et al. (2010) and Roelen et al. (2012) found considerable differences in the incidence of child poverty in Vietnam which were linked mainly to geographical location and ethnicity. Overall, however, evidence of differences between the empirical outcomes of monetary and multidimensional poverty measures and underlying drivers remains

scarce. Furthermore, there is little discussion about the policy implications of such differences or about how to use the two types of measures – even though this discussion is particularly interesting against the background of the upcoming Sustainable Development Goals (SDGs), which, among others, include the goal of ending poverty in all its forms and everywhere (OWG 2014). Limited availability of data sets that are suitable for deriving both measures is most likely the main reason for this lack of evidence and discussion. And yet this debate is particularly relevant, because poverty measures are often used as a basis for targeting and allocating transfers and services to those considered in need – for example in the context of development interventions supported by official development assistance (ODA). Further examination of the differences between monetary and multidimensional poverty measurement and their policy implications is therefore an important contribution to the literature as well as to enabling informed decision-making in the context of poverty reduction. We have explored these questions for Laos, a country with high economic growth rates that has achieved monetary poverty reduction in the past, but has been less successful in raising people’s well-being in dimensions other than income.

### *Monetary and multidimensional poverty in Laos*

Since the introduction of the New Economic Mechanism (1986), Laos has been successful in sustaining a high economic growth, with annual growth rates averaging 7% over the last two decades. The Lao government has also been relatively effective in transforming these economic achievements into poverty reduction – referring to the well-known USD 1.25 a day approach. The proportion of people living below the poverty line has been

reduced by more than 40% compared to the levels recorded in 1992/1993. In 2007/2008, the poverty rate according to the national poverty line was reported at 27.4%, whereas AUTHOR REFERENCE (2015) estimated multidimensional poverty at 35% for the same year (TABLE 1). A look at the levels of achievement of other MDG targets reveals some of the reasons for this considerably higher multidimensional poverty rate. Regarding nutrition, for example, the country is seriously off-track, with stunting affecting 44% of children under the age of five in 2008 (WFP 2013; UN 2013).

*Table 1* Differences between the incidences of monetary and multidimensional poverty in Laos, 2007/2008

	USD 1.25 a day	National poverty line	Multidimensional poverty
Poverty ratio	37.3%	27.4%	35.0%

And although net enrolment in primary school rose from 58% of children in 1990 to 84% in 2005, the dropout rate is still high (UNDP 2010). Furthermore, Laos continues to have one of the highest maternal mortality rates in the region (UN 2013; The World Bank 2013).

In view of these figures, we oppose the assumption made in the MDG process that income is a suitable indicator for measuring poverty. Instead, we hypothesize that poverty is more than a lack of money and that alternative poverty measures are needed to adequately measure it. We test this hypothesis by identifying and analyzing differences between the monetary and a multidimensional poverty measure in Laos for the year 2007/2008.

Furthermore, this study aims to identify what subgroups of the population are identified as poor according to one or both measures of poverty, and what might be the drivers of

the empirical differences observed. The study is organized as follows: Section 2 presents the data source and the analytical strategy we follow to answer the research questions. In addition, we present the calculation framework for both the monetary and the multidimensional poverty measure used in this study. Section 3 first presents differences in the incidence of poverty and in rankings of population subgroups between multidimensional and monetary poverty in Laos. Next, we discuss the differences between monetary and multidimensional poverty for different subgroups of the population, and analyze to what extent one poverty measure might serve as a proxy for the other. This is followed by a presentation of the household characteristics and determinants associated with the probability of a household being identified as poor in multidimensional but not in monetary terms, as poor only in monetary terms, or as poor in both multidimensional and monetary terms. Finally, in Section 4, we draw conclusions from our findings and point out policy implications for Laos.

## Data and methodology

The data used for the analysis are from the Lao Expenditure and Consumption Survey (LECS) of 2007/2008, a household-level survey conducted by the Lao Statistics Bureau (LSB) (LSB 2013). The LECS 2007/2008 surveyed a representative sample of 8,376 households totaling 48,021 individuals. It provides microdata at the level of both households and their individual members on nutrition, demographic, and health aspects, as well on educational attainment, labor market outcomes, physical household features, and other areas of social and material well-being. In line with our aim of comparing monetary and multidimensional poverty, we only included households for which we had data on all indicators needed to calculate both poverty measures. Accordingly, for the purpose of this study we created a subsample comprising 8,134 households (97% of all LECS households). We calculated the multidimensional poverty measure ourselves, whereas for the monetary poverty measure we refer to the work of the Lao Government in cooperation with the World Bank on poverty in Laos (MPI 2010).

### Monetary and multidimensional measures of poverty

This section outlines the different measures of poverty in Laos that we used in this study. The construction of the multidimensional poverty measure follows Alkire and Foster's methodology (Alkire & Foster 2011), which we discuss in two subsections. The first focuses on the selection of dimensions, indicators, and thresholds for our multidimensional poverty measure for Laos, while the second explains the measure's construction.



*Selection of dimensions, indicators, and poverty cut-offs for the multidimensional poverty measure*

Selection of dimensions, indicators, and poverty cut-offs in this study closely follows the methodology used for the global multidimensional poverty index (MPI) that was presented in the Human Development Report 2010 (UNDP 2010; Alkire & Santos 2010). The MPI is a deprivation-based measure which goes back to Peter Townsend's (1979) concept of relative deprivation and Sen's (1980) concept of capability deprivation. According to Townsend, relative deprivation refers to a standard of living that is below the average in several respects including resources, capabilities, and rights. The definition of deprivation is thus necessarily related to a society's notion of adequate living conditions. For this reason, the selection of dimensions and indicators for the global MPI was guided by the eight MDGs, with some restrictions due to limited data availability. The multidimensional poverty measure used in the present study includes three dimensions: health, education, and standard of living. Two indicators are used for the education dimension, one for the health dimension, and six for the living standard dimension (see TABLE A1). Following the idea of proximate literacy (Basu & Foster 1998), non-deprivation with regard to the years of schooling indicator requires that at least one household member has completed primary school. The logic behind this is that the whole household benefits from having even just one literate member (so-called intra-household externality). Non-deprivation with regard to the second indicator in the education dimension requires that all school-aged children in a household attend school<sup>2</sup>. Due to a lack of data on child mortality, the health dimension consists only of the nutrition indicator. Based on the framework of Kakwani, Datt et al. (2002), a household is malnourished – and hence considered

deprived with regard to this indicator – if it spends less on food than is required to buy a food basket that provides 2100 calories per day. Access to electricity and flooring material are not included in the MDGs, but both of these indicators provide some rudimentary information about the quality of housing (Alkire & Santos 2010). As clean cooking fuel prevents respiratory diseases, a household is assumed to be deprived if cooking with dung, wood, or charcoal. The sanitation indicator refers to environmental sustainability. A household is considered deprived if the sanitation facility is not improved or if it is shared with other households. If a household has no access to safe drinking water at all, or if accessing safe water requires a round trip of more than 30 minutes on foot, the household is considered to be deprived of access to safe drinking water. The last indicator in the living standard dimension covers ownership of certain assets, including a car, radio, television set, telephone, bicycle, and motorbike.

Some of the indicators refer to individuals and others to households. For this reason, the MPI applies a unitary household definition, according to which all members of a given household are assigned the same poverty status. As a result, the MPI cannot reflect intra-household inequality. The dimensions and indicators are weighted according to Alkire and Foster (2011): each dimension receives equal weights of 1/3, and indicators are weighted equally within their corresponding dimension. Since we were unable to include child mortality, the relative weights we used are not entirely the same in absolute terms as defined by Alkire and Santos (2010). We are aware that using equal weights normatively attributes equal importance to all dimensions; but despite a critical debate on how to adequately weight dimensions (Alkire & Foster 2011, Ravallion 2010, Ravallion 2012), no operational alternatives to equal weights exist to date.

### Identification of the multidimensionally poor

Identification of the multidimensionally poor is based on Alkire and Foster's framework (Alkire & Foster 2011) and on the Foster–Greer–Thorbecke measures (Foster, Greer et al. 1984). The multidimensionally poor are identified using a two-component multidimensional poverty measure consisting of (1) the multidimensional poverty headcount ratio (H), which indicates the incidence of poverty, and (2) an adjustment measure (A), which captures the average intensity of poverty, that is, the average number of indicators with regard to which a multidimensionally poor person is deprived at the same time. The multidimensional poverty measure can therefore be denoted as follows:

$$MPI = H * A$$

where

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

The multidimensional poverty headcount ratio (H) provides the number of poor people (q) in a society divided by the total number of individuals (n) in that society. Thus H is similar to the traditional USD 1.25 a day poverty headcount ratio, although the number of multidimensionally poor people (q) is assessed via a dual cut-off approach that uses  $\rho_k(y_i; z)$  as identification method.

The total number of multidimensionally poor is given by:

$$q = \sum_{i=1}^n \rho_k(y_i; z)$$

where  $y_i = (y_{i1}, \dots, y_{ij}, \dots, y_{id})$  represents the profile of individual or household  $i$ 's achievements across indicators ( $d$ ). The first cut-off – the deprivation cut-off – is given by  $z_j$ , which is the deprivation threshold for each specific indicator  $j=1, \dots, d$  that separates the deprived from the non-deprived as shown in TABLE A1. An example of a specific indicator's deprivation cut-off ( $z_j$ ) might be that one household member has at least five or more years of schooling. The second cut-off, called the poverty cut-off, is represented by ( $k$ ). The poverty cut-off defines the share of (weighted) deprivations ( $k$ ) a person must have in order to be identified as poor. In the framework developed for the global MPI by Alkire and Santos (2010), a person is considered poor if he or she has a deprivation score that is higher than  $k = 3^3$ . The poverty status of a person  $i$  is defined as a dichotomous variable, with  $\rho_k(y_i; z) = 1$  (poor) whenever the number of weighted deprivations ( $c_i$ ) is greater than  $k$ , and  $\rho_k(y_i; z) = 0$  (not poor) whenever  $c_i < k$ .

Like the conventional poverty headcount ratio, the multidimensional poverty headcount ratio (H) also violates one of the axioms (Sen 1976; Alkire & Foster 2011) that a poverty measure should reasonably fulfil<sup>4</sup>. For this reason, H is adjusted by the so-called intensity of poverty (A), which reflects the number of different deprivations suffered by the poor.

$$A = \frac{\sum_{i=1}^n c_i(k)}{q}, \text{ if } c_i > k$$

where  $c_i(k)$  is the censored deprivation score of individual  $i$ , and  $q$  is the number of people who are multidimensionally poor. In  $c_i(k)$  we assign a deprivation score to each

individual according to his or her deprivations. The deprivation score of each person is calculated as a weighted sum of the number of deprivations in such a way that  $c_i(k)$  is between 0 and 1. If a person is deprived with regard to every indicator, the deprivation score equals 1, and vice versa. Using the formula:

$$c_i = w_1 I_1 + w_2 I_2 + \dots + w_d I_d$$

where  $I_i = 1$  if the person is deprived with regard to indicator  $i$  and  $I_i = 0$  otherwise, and  $w_i$  is the weight attributed to indicator  $i$  with  $\sum_{i=1}^d w_i = 1$ .

### Identification of the poor in monetary terms

The monetary poverty measure in Laos follows common practice in developing countries and is calculated on the basis of consumption levels<sup>5</sup>. This is reflected in the LECS, which records detailed information on household consumption expenditure<sup>6</sup>. The poverty line used in the present study is the national poverty line, which is based on a calorie requirement of 2100 calories per person per day, plus an allowance for non-food consumption, with the latter depending on whether the household is located in an urban area, a rural area, or in Vientiane Capital. In addition, for some analyses we refer to the international poverty line of USD 1.25 per person per day. The monetary poverty estimates belong to the Foster–Greer–Thorbecke class (Foster et al. 1984) of poverty measures and can be stated as follows:

$$\text{Monetary poverty} = \frac{1}{n} \sum_{i=1}^q \left( \frac{x_i}{z} \right)^\alpha$$

where  $n$  represents the total population,  $q$  represents the population below the defined poverty line ( $z$ ), and  $x_i$  is the individual's income. For the purpose of this study we set  $\alpha=0$  to obtain the monetary poverty headcount<sup>7</sup>.

### Methods of analysis

We first identified the poor in monetary terms using household consumption levels according to the official statistics of the Lao Statistics Bureau (LSB 2013), and then calculated multidimensional poverty using the MPI presented in an earlier study by AUTHOR REFERENCE (2015). Based on the so-called integrated model for measuring poverty, a framework proposed by Beccaria and Minujin (1985) and Katzman (1989), which we adapted for the purpose of our study, we identified four categories of people: those who are (1) poor in monetary and multidimensional terms, (2) poor in monetary but not in multidimensional terms, (3) poor in multidimensional but not in monetary terms, and (4) non-poor (TABLE A2). The literature uses a range of descriptions for those identified as poor in both monetary and multidimensional terms. For example, Beccaria and Minujin (1985) use “chronic poor”, Nolan and Whelan (1996) use “consistently poor”, and Bradshaw and Finch (2003) use “core poor”. We use the term “poorest of the poor” because the people in this category struggle with insufficient income as well as structural deprivations regarding non-income indicators. Moreover, we observed that the majority of these households faced deprivations regarding more than 50% of the weighted indicators in the MPI. Category 2 – households that are poor in monetary terms but not in multidimensional terms – we refer to as “income-poor”. Households that are multidimensionally poor but not poor in monetary terms (category 3) are labelled as

“overlooked poor”. This is the group of people identified as monetary non-poor so far, but who are experiencing multiple deprivations with regard to other dimensions of poverty. Using cross-tabulations and a Venn diagram we present the degree of overlap between the categories of the poor in monetary terms and the multidimensionally poor. The four categories in TABLE A2 are mutually exclusive, making multinomial logit regression the appropriate method for analysis (see also Whelan et al. 2004). Multinomial logit regression enables the detection of underlying dynamics causing households to be identified as poor in monetary and/or multidimensional terms. Instead of using standard multinomial logit coefficients (see Table A6), we follow the argumentation of Mood (2010) and Wooldridge (2010) and use average marginal effects to show how the different indicators affect the probability of a household belonging to a certain poverty category relative to other indicators. This is in contrast to earlier studies comparing monetary and multidimensional poverty, which have used relative risk ratios (e.g. Roelen et al. 2012). Based on earlier studies on drivers of poverty in Laos, we include information on the sex of the household head, household size (Andersson et al. 2006), geographical location of the household, affiliation to ethnolinguistic families (Engvall 2006; Epprecht et al. 2008), and market access (Warr 2005; Oraboune 2008; Messerli et al. 2015). For market access we use travel time to the district center as a proxy, based on Epprecht et al. (2008) and Messerli et al. (2015).

### **Differences between monetary and multidimensional poverty in Laos**

This section focuses on how the incidence of poverty and the composition of population groups identified as poor differ depending on the poverty measure used. To start with, we analyzed the association of monetary poverty and the indicators we used for the multidimensional poverty measure. The correlation matrix reveals fairly low or medium levels of correlation, except for the correlations between nutrition and monetary poverty as well as between assets and monetary poverty (TABLE A3). This suggests that income alone is not an adequate indicator for measuring the well-being of households in Laos. The highly significant correlation level of 0.68<sup>8</sup> between monetary poverty and nutrition is in line with country-specific studies on monetary poverty determinants in Laos, which found that malnutrition is a serious threat for almost half of the population, namely children (WFP 2008; MPI 2010; Fenton et al. 2010; UN 2013; WFP 2013).

TABLE A4 shows the percentage of multidimensionally poor by quintiles of household income. Strikingly, multidimensionally poor households are found even in the richest quintile, and multidimensionally non-poor households exist even in the poorest quintile. In other words, 5% of people in the top income quintile face deprivations in at least one out of the three dimensions of education, health, and living standard. This contradicts the widely accepted notion that income is a good enough measure to reflect overall well-being, since even people who are rich in monetary terms are relatively deprived compared to accepted standards as defined in the MDGs.



### **Differences in the incidence of poverty and in rankings of population subgroups**

A comparison between the incidences of monetary and multidimensional poverty in Laos was presented in TABLE 1<sup>9</sup>. Using the national poverty line, almost 28% of the population are identified as poor in monetary terms. By comparison, the incidence of multidimensional poverty is 35%.<sup>10</sup> Following Nolan & Whelan 2009, we adjusted the value of  $k$  for the MPI to minimize the difference between the incidences of monetary and multidimensional poverty. This enabled us to test in a robust manner whether the two measures identify the same households or completely different ones as poor. Moreover it places the focus on differences in group composition rather than size. Out of FIGURE A1, we conclude that a  $k$  value of 34% – resulting in a multidimensional poverty incidence of 31% – minimizes the difference between the incidences of monetary and multidimensional poverty. Using this  $k$  value means that a household has to be deprived with regard to more than one-third of the weighted indicators in order to be identified as multidimensionally poor. In TABLE 2 we present poverty profiles and ranks for various population subgroups in Laos. Looking at poverty incidences among different subgroups, the two measures show considerable differences regarding geographical locations, market access, and ethnolinguistic families. For example, the MPI measures greater inequality between the ethnic majority group of the Lao-Tai and ethnic minority groups than the monetary measure does.

Table 2 Poverty profiles and ranks for various population subgroups in Laos

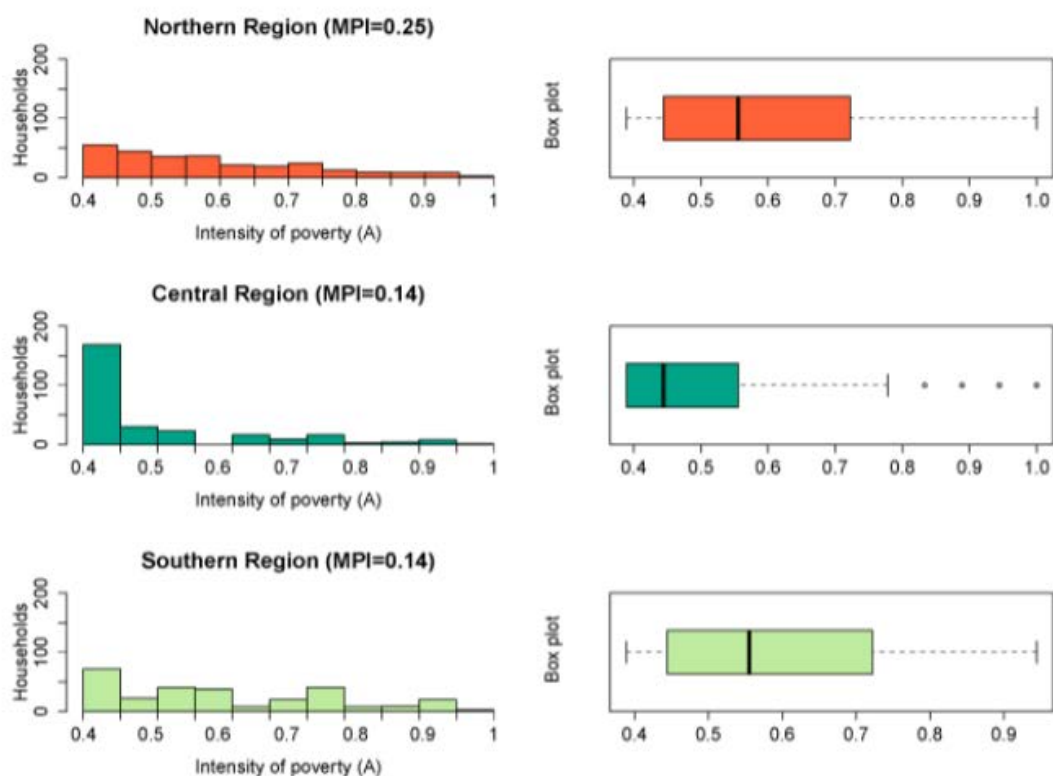
		Poverty incidence		
		Monetary poverty	Multidimensional poverty	$\Delta$ incidence
Household head				
	Male	0.28 (2)	0.32 (2)	+4
	Female	0.25 (1)	0.28 (1)	+3
Household size				
	1-2 members	0.02 (1)	0.14 (2)	+12
	3-4 members	0.08 (2)	0.13 (1)	+5
	5-6 members	0.20 (3)	0.24 (3)	+4
	7-8 members	0.34 (4)	0.37 (4)	+5
	9-10 members	0.49 (5)	0.55 (5)	+6
	10+ members	0.60 (6)	0.63 (6)	+3
Area				
	Urban	0.17 (1)	0.19 (1)	+2
	Rural	0.32 (2)	0.37 (2)	+5
Altitude				
	Lowland	0.20 (1)	0.22 (1)	+2
	Midland	0.29 (2)	0.34 (2)	+5
	Upland	0.43 (3)	0.51 (3)	+8
Region				
	Northern	0.36 (3)	0.43 (3)	+7
	Central	0.26 (2)	0.29 (2)	+3
	Southern	0.21 (1)	0.25 (1)	+4
Province				
	Vientiane Capital	0.15 (02)	0.18 (04)	+3
	Phongsaly	0.46 (15)	0.62 (17)	+16
	Luangnamtha	0.31 (09)	0.47 (13)	+16
	Oudomxay	0.33 (11)	0.43 (11)	+10
	Bokeo	0.33 (11)	0.32 (08)	-1
	Luangprabang	0.27 (06)	0.32 (08)	+5
	Huaphanh	0.51 (16)	0.49 (14)	-2
	Xayabury	0.16 (03)	0.10 (01)	-6
	Xiengkhuang	0.42 (14)	0.52 (15)	+10
	Vientiane	0.28 (07)	0.37 (10)	+9
	Borikhamxay	0.22 (04)	0.17 (03)	-5
	Khammuane	0.32 (10)	0.30 (06)	-2
	Savannakhet	0.28 (07)	0.30 (06)	+2
	Saravane	0.35 (13)	0.44 (12)	+9
	Sekong	0.51 (16)	0.55 (16)	+4
	Champasack	0.10 (01)	0.16 (02)	+6
	Attapeu	0.25 (05)	0.27 (05)	+2
Ethnolinguistic families				
	Lao-Tai	0.18 (1)	0.19 (1)	+1
	Minority groups	0.45 (2)	0.55 (2)	+10
Market access				
	High	0.20 (1)	0.22 (1)	+2
	Middle	0.29 (2)	0.34 (2)	+5
	Low	0.43 (3)	0.51 (3)	+8

The rankings of provinces by poverty show a diverse picture. While the differences between the two measures are marginal in most provinces, the northernmost provinces of Phongsaly and Luangnamtha appear markedly better off when using a monetary poverty

approach. Rankings also differ between measures with respect to household size. When using the monetary approach, ranks are positively correlated with household size, meaning that the fewer members a household has, the lower is its risk of being poor in monetary terms, and vice versa. Deaton and Paxson (1998) attribute this to the fact that monetary poverty is measured on the basis of per capita consumption and is hence more likely to identify people from large families as poor because it ignores economies of scale within the household. The correlation is slightly different when using the multidimensional poverty measure: in this case, poverty increases less consistently with household size than is the case when using the monetary measure. This finding is in line with other studies on differences between monetary and multidimensional poverty measures (Tran–Quang, Alkire et al. 2014; Gaihre 2012).

The ranking of regions by poverty headcount ratio is the same for both measures: the Northern Region is the worst off, followed by the Central and finally the Southern regions. This changes if we include the intensity of poverty (A) and compare the rankings by monetary poverty and by MPI as a whole, as shown in FIGURE 1:

Fig. 1. Distribution of the intensity of poverty (A) among households by region



If we take a multidimensional approach to poverty and include both the poverty headcount ratio (H) and the intensity of poverty (A), the Southern Region no longer has a lower poverty rate than the Central Region. Instead, the Southern and the Central regions rank the same, followed by the Northern Region. This suggests that the intensity of multidimensional poverty (A) is an important parameter for analyzing poverty in Laos.

FIGURE A2 underlines the importance of the intensity of poverty (A) in Laos by plotting both factors of the MPI – the multidimensional poverty headcount ratio (H) and the intensity of poverty (A) – for selected least developed countries<sup>11</sup>. The graph shows two clusters of countries with a share of poor people below or over 50%, respectively. It also reveals that although Laos has one of the lowest shares of multidimensionally poor people, the intensity of poverty is relatively high. Within the cluster of countries with a multidimensional poverty headcount ratio below 50%, Laos and Yemen have the highest

poverty intensity. Strikingly, Liberia's multidimensional poverty headcount ratio is twice as high as that of Laos (71.2% compared to 34.1%), whereas poverty intensity is nearly the same in both countries. The multidimensional poverty headcount ratio of Laos's neighbor Cambodia is more than ten percentage points higher (45.9%) than that of Laos, while the intensity of poverty is lower than in Laos. In other words, although Laos has a relatively low incidence of multidimensional poverty compared to other least developed countries, the average multidimensionally poor person in Laos faces deprivations with regard to more indicators than multidimensionally poor people in other least developed countries. This points to the costs at which development in Laos comes: There seems to be a population segment that is systematically left behind and is unable to profit from the overall macroeconomic development.

### **Differences in the composition of population groups identified as poor**

From a policy perspective, it is interesting to see not only whether monetary and multidimensional poverty differ in their incidence among various population subgroups, leading to different poverty rankings of these subgroups, but also whether the two poverty measures identify the same or different population groups as poor. To answer the latter question, we examined which households are identified as (1) poor in both multidimensional and monetary terms ("poorest of the poor"), (2) poor in monetary terms only ("income-poor"), (3) multidimensionally poor only ("overlooked poor"), and (4) non-poor.

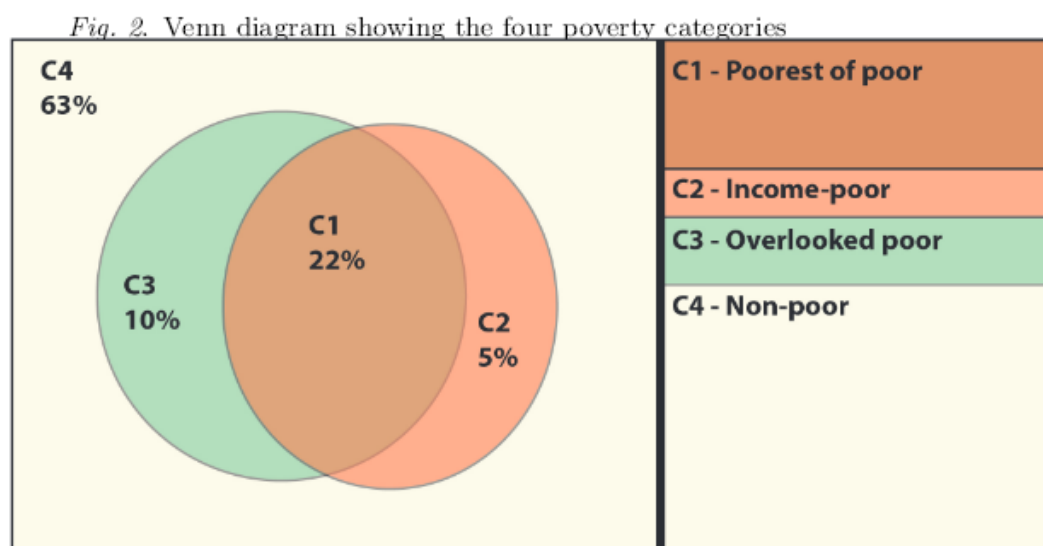


FIGURE 2 presents the percentages of people identified as poor using the monetary and/or the multidimensional poverty measure in a Venn diagram. The percentages indicated show that the degree of overlap between the two measures is limited. Although nearly 60% of the poor were identified by both measures, as much as 13% of the population were identified as poor in monetary terms only, and 27% were identified as poor only when using the multidimensional poverty measure. Earlier studies found similar differences between monetary and multidimensional poverty measures (Roelen et al. 2012; Ataguba et al. 2013).

Table 3 Descriptive statistics by poverty category

	% of pop	Poverty categories			
		Poorest of poor (category 1)	Income-poor (category 2)	Overlooked poor (category 3)	Non-poor (category 4)
<b>Household head</b>					
Male	95	21.76	5.84	9.95	62.45
Female	5	20.70	3.97	7.62	67.71
<b>Area</b>					
Urban	29	13.12	4.18	5.63	77.06
Rural	71	25.21	6.37	11.53	56.88
<b>Altitude</b>					
Lowland	57	15.27	5.11	6.93	72.69
Midland	19	22.69	6.37	11.58	59.35
Upland	24	35.81	6.70	15.16	42.33
<b>Region</b>					
Northern	26	29.14	7.12	13.54	50.21
Central	47	20.89	5.40	8.35	65.36
Southern	27	15.86	4.99	8.76	70.40
<b>Ethnolinguistic families</b>					
Lao-Tai	66	13.00	5.21	6.23	75.56
Mon-Khmer	21	39.57	7.61	12.68	40.14
Sino-Tibetan	03	38.58	3.21	32.36	25.84
Hmong-Mien	09	37.64	6.08	21.28	34.99
Other	01	18.05	3.90	18.88	59.17
<b>Market access</b>					
High	39	11.59	4.24	6.36	77.80
Middle	34	19.17	5.78	10.00	65.05
Low	27	38.67	7.53	12.80	40.00
<b>Total</b>	<b>100</b>	<b>21.58</b>	<b>5.66</b>	<b>9.63</b>	<b>63.13</b>

In order to gain a deeper understanding of the differences in empirical outcomes of the two poverty measures, we first looked at descriptive statistics for the four poverty categories (TABLE 3). The analysis shows that although households living in rural areas are overrepresented in categories 1, 2, and 3, their share is similar in all three categories. In contrast, we find that the shares of poor households differ between categories depending on altitude, region, and ethnicity. For example, the Lao-Tai ethnolinguistic family is underrepresented among households that are poor in multidimensional terms only: category 3 comprises nearly 10% of all households, but only 6% of Lao-Tai households. Conversely, all other ethnolinguistic families are overrepresented in this category. TABLE 3 also reveals that households with limited market access are markedly

overrepresented in categories 1 and 3, but not as clearly so in category 2, that is, among households who are poor in monetary terms only. Similar findings were presented by Epprecht et al. (2011) for Vietnam, where ethnicity and market access contributed significantly to poverty.

TABLE A5 presents the proportion of people in each poverty category who experienced deprivation with regard to each specific indicator. Estimates for category 2, which comprises those who are considered poor only when using the monetary measure, suggest that almost every household in this category faces deprivation with regard to at least one other indicator in addition to income. This holds true even if we leave out cooking fuel, of which almost all people across all categories are deprived. The deprivation scores for sanitation and flooring are among the lowest in all categories. Besides cooking fuel, the most salient deprivation scores concern electricity, assets, and drinking water. Estimates for category 3 – households that are multidimensionally poor only – are highly relevant from a policy perspective, in the sense that these households suffer from multiple deprivations but are not considered poor from a purely monetary perspective. For example, 46% of people identified as poor only by the multidimensional measure are deprived regarding nutrition but are officially (i.e. in monetary terms) considered non-poor. Finally, TABLE A5 also shows that although households in category 4 were identified as non-poor by both poverty measures, this category's deprivation scores with regard to assets, electricity, and drinking water range between 0.18 and 0.26, meaning that one-quarter of the non-poor have no adequate access to safe drinking water. Moreover, we found that these deprivation scores of non-poor households are



significantly higher in rural areas and among households belonging to ethnolinguistic minority groups.

### **Drivers of differences between measures**

The findings on differences between the monetary and the multidimensional poverty measure in the incidence of poverty and in the composition of population groups identified as poor show that different poverty measures identify different households as poor. This contradicts the assumption underlying the conventional monetary poverty measure that income is an appropriate proxy for the overall well-being of individuals. For this reason, poverty analysis and poverty reduction policies should not rely on a single poverty measure. But to what extent do the various indicators increase or reduce the probability of a household being identified as poor by neither, one, or both poverty measures? Taking advantage of the adapted integrated model for measuring poverty, which separates the population into four mutually exclusive categories, we used multinomial logit regression to further analyze the impact of the various characteristics of households and their locations on the probability of their belonging to either one of the four categories. TABLE 4 presents the results of this analysis using average marginal effects. One example of their interpretation is that the probability of being non-poor is on average about eight percentage points higher for households in urban areas than for households in rural areas with identical other characteristics.

*Table 4* Average Marginal Effects (AME) for household characteristics on probability of household belonging to each poverty category (based on multinomial logit coefficients)

Variable	Average Marginal Effects			
	Poorest of poor (category 1)	Income-poor (category 2)	Overlooked poor (category 3)	Non-poor (category 4)
Household head [Male]				
<i>Female</i>	0.83 (2.066)	-0.55 (1.101)	2.15 (1.758)	-2.44 (2.171)
Area [Urban]				
<i>Rural</i>	2.76* (1.280)	1.56* (0.659)	3.90*** (0.924)	-8.21*** (1.374)
Altitude [Lowland]				
<i>Midland</i>	2.32 (1.213)	-0.29 (0.741)	2.14* (1.039)	-4.17** (1.370)
<i>Upland</i>	3.72** (1.238)	-1.42 (0.724)	1.28 (1.000)	-3.58* (1.414)
Region [Central]				
<i>Northern</i>	-5.60*** (1.115)	1.15 (0.709)	-2.19* (0.903)	6.64*** (1.251)
<i>Southern</i>	-6.19*** (1.111)	-1.01 (0.580)	-0.38 (0.959)	7.53*** (1.181)
Ethnolinguistic families [Lao-Tai]				
<i>Mon-Khmer</i>	22.51*** (1.293)	0.68 (0.718)	7.33*** (0.936)	-30.51*** (1.421)
<i>Sino-Tibetan</i>	11.18*** (2.294)	-3.42*** (0.826)	31.72*** (3.069)	-39.48*** (2.926)
<i>Hmong-Mien</i>	16.45*** (2.083)	0.86 (0.225)	15.91*** (2.071)	-33.22*** (2.500)
<i>Other</i>	1.10 (4.809)	-0.66 (3.402)	11.09* (5.360)	-11.54 (6.961)
Market access [Middle]				
<i>High</i>	-3.87*** (1.064)	-1.04 (0.654)	-0.87 (0.953)	5.77*** (1.325)
<i>Low</i>	14.12*** (1.192)	1.29 (0.717)	1.85* (0.901)	-17.27*** (1.363)
Observations	7926	7926	7926	7926

Note: The table presents average marginal effects after a multinomial logit (see Appendix). The dependent variable are the four poverty categories. The reference categories are in brackets, standard errors in parentheses, \*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$

A first conclusion from TABLE 4 is that households in rural areas are generally more likely to be identified as poor than households in urban areas, regardless of the poverty

measure employed. This can be seen from the fact that the average marginal effect of a household being rural relative to its being urban is positive for poverty categories 1, 2, and 3. Furthermore, the results suggest that households in midland and upland areas are more likely on average to be identified as poor in both monetary and multidimensional terms than households living in lowland areas. The same does not apply for the monetary measure: in this case, the average marginal effects are negative and not significant. Among the differences between geographical areas, those between the different regions of Laos are particularly striking. Given the same set of other characteristics, households living in the Northern or the Southern regions are considerably less likely to be identified as poor in both monetary and multidimensional terms than households in the Central Region.

Furthermore, TABLE 4 reveals interesting findings on the relation between poverty and ethnolinguistic families in Laos. A household belonging to the majority ethnolinguistic family, the Lao-Tai, is significantly less likely to be identified as poor than households belonging to other ethnolinguistic families – regardless of the poverty measure employed. The average marginal effects of ethnolinguistic family on poverty category 3, which comprises households who are poor only in multidimensional, but not in monetary terms, are particularly striking. These high average marginal effects suggest that households belonging to ethnolinguistic minorities such as the Mon-Khmer, the Sino-Tibetan, the Hmong-Mien, and other, smaller ethnolinguistic families are more likely to be identified as multidimensionally poor compared to households belonging to the majority ethnolinguistic family of the Lao-Tai. The probability of being identified only as

multidimensionally poor is about 16 percentage points higher on average for Hmong–Mien households than for Lao–Tai households.

Regarding the marginal effects of market access on belonging to the different poverty categories, TABLE 4 reveals that the probability of households with limited market access being identified as poor in both monetary and multidimensional terms is about 14 percentage points higher on average compared to households with average market access and identical other household characteristics.

## Discussion and conclusion

Several countries – such as Mexico, Colombia, and Vietnam – have officially adopted multidimensional poverty measures. In view of this growing interest, the present study investigated whether monetary and multidimensional poverty measurements in Laos lead to different empirical outcomes. Our findings suggest considerable differences. They will be discussed in this section, including their implications for future poverty measurement and, to some extent, for policymaking. The majority of countries in the developing world rely exclusively on monetary poverty measurement in the context of their national development monitoring activities. Advocates of monetary poverty measures argue that although poverty is a multidimensional phenomenon, income is an adequate indicator for measuring it. This is the rationale behind the poverty threshold of USD 1.25 a day in MDG 1. If this were the case, however, we would have found a nearly perfect overlap between population groups identified as poor using the multidimensional poverty measure and those identified as poor using the monetary poverty measure. This was not the case, given the considerably large number of households (27%) who are only identified as poor when using a multidimensional measure (the “overlooked poor”). This finding supports Sen’s argument that deprived people should not be viewed simply “as members of the huge army of ‘the poor’ (Sen 1981:156). Classifying the population into rich and poor is too reductionist to be helpful in analyzing drivers of poverty and constructing adequate policies to reduce poverty. Findings in the category of the “overlooked poor” are highly relevant from a policy perspective, because households in this category are not identified as poor by the current official (monetary) poverty measure. These households can be viewed as those who pay the “costs” of modernization. As Rigg (2015) pointed out, a

particular problem of contemporary monetary poverty analysis is that it views “the poor” as those who are not effectively integrated into the market–economy; but in Laos, even households that escaped monetary poverty thanks to the country’s market–led development nonetheless suffer from multiple deprivations in the dimensions of education, health, and living standard. In other words, an estimated 10% of the Laotian population is not poor in monetary terms but nonetheless has a standard of living that is below accepted levels (i.e. below the levels defined in the MDGs) in several respects, including resources, capabilities, and rights. The high deprivation scores in the education dimension and with regard to the nutrition indicator for people in poverty category 3 – the “overlooked poor” – point towards the conclusion that education and nutrition play a crucial role in differentiating between monetary and multidimensional poverty. Furthermore, our findings on differences in the identification of poor people among ethnolinguistic groups are particularly controversial. They show that households belonging to ethnolinguistic families other than the Lao–Tai are overrepresented in poverty category 3, the “overlooked poor”. For example, the probability that households belonging to minority ethnolinguistic families such as the Mon–Khmer and Hmong–Mien are identified as poor in multidimensional terms only is about 7 and 16 percentage points higher on average, respectively, than that of Lao–Tai households falling in this poverty category. Furthermore, we found that the average Lao–Tai household is less likely to be identified as poor in both monetary and multidimensional terms than the average household belonging to any other ethnolinguistic family.

These findings support, to some extent, the arguments put forth by Tsui (2002), Thorbecke (2007), and Deaton (1997) that income is not a good enough measure of

poverty. Our results also support Sen's call for a shift of focus from means to ends. Sen argued that we should always be clear, when valuing something, whether we value it as an end in itself or as a means to a valuable end. The main reason for this is that people differ in their ability to convert means into valuable opportunities (capabilities) or outcomes (functionings) (Sen 1992: 26–28, 36–38). In the theoretical framework of the capability approach, these inter-individual differences are referred to as “conversion factors” (Robeyns 2005: 99). In the case of Mon–Khmer and Hmong–Mien households, for example, it can be argued that although they might have enough income, they lack conversion factors enabling them to convert income (means) into achievements (ends) – such as in education, health, or a certain living standard. Accordingly, it can be argued that ethnolinguistic groups such as the Mon–Khmer or the Hmong–Mien require means other than income to achieve valuable ends.

The general finding of this study – that the differences between households identified as poor in Laos using a monetary and a multidimensional poverty measure are considerable when looking at specific subgroups of the population – has important implications for policy debates in Laos. First, like findings from other countries (Santos 2013; Roelen et al. 2012), our evidence from Laos clearly points to the conclusion that monetary poverty cannot serve as proxy for multidimensional poverty and vice versa. The correlation between monetary poverty and the various indicators of multidimensional poverty proves to be limited. This means that efforts to monitor and evaluate the outcomes of poverty reduction policies can lead to different conclusions when based only on a single poverty measure, depending on the measure used. One example of possible differences in measured policy outcomes is the ranking of regions by poverty. Relying only on the

monetary poverty measure, one would conclude that the level of poverty is lowest in the Southern Region of Laos, whereas the MPI reveals that the Southern Region is in fact just as poor as the Central Region. Moreover, the multinomial logit regression analysis revealed that households in the Central Region are more likely to be identified as “poorest of the poor”, meaning that they are poor in both monetary and multidimensional terms.

Second, our results suggest that the type of poverty measure used in Laos is particularly decisive for minority groups, such as groups belonging to ethnolinguistic families other than the Lao–Tai. This is because the monetary poverty measure does not capture actual achievements, such as the effective purchase of goods or services or actual access to infrastructure, but only measures the economic possibility of reaching a given level of well-being. To avoid overlooking those who have enough income, but cannot convert it into achievements for various reasons, Laos needs poverty indicators related to achievements (ends) in addition to those related to income (means). Monitoring and evaluation of poverty reduction policies can become more effective if they take account of improvements with regard to the non-income indicators included in multidimensional poverty measures. Moreover, the adoption of a multidimensional poverty measure in Laos would increase the visibility of subgroups that have been eclipsed so far, and would help to place their concerns on the public agenda. Finally, analysis of the overlap between the monetary and the multidimensional poverty measures revealed that among the population identified as poor by either the monetary or the multidimensional measure in Laos, 60% were identified as poor by both measures. This part of the population represents the category of the poorest of the poor. Governments should use this



information to adjust their poverty reduction policies and ensure that they reach people living in severe poverty with greater accuracy.

In view of the finding that complementing the current monetary poverty measure with a multidimensional measure would reveal a wealth of policy-relevant information, Laos should consider developing a tailor-made national MPI. Possible country-specific indicators might include, for example, poor environmental conditions and insecure land tenure, which have proven to be possible causes of poverty in Laos (Schönenweger et al. 2012; Miles 2014). A country-specific MPI would be particularly useful for analyzing whether the benefits of recent economic growth mainly reduced income poverty or whether they also reduced deprivations in other dimensions of poverty. Moreover, as we showed in section 3.1, the MPI's poverty intensity component plays a crucial role in the poverty ranking of subgroups in Laos. We therefore expect that introducing a country-specific MPI will help in many ways to better target poverty reduction policies and interventions in Laos. However, new poverty indicators should not be defined by researchers alone. The definition of meaningful poverty indicators requires a public debate and citizen participation (Alkire 2008; Alkire et al, 2015).

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XXX. 2015 Authors citation

## Appendix Tables

**Table A1** Selection of dimensions, indicators, deprivation cut-offs, and weights for the multidimensional poverty index applied

Dimension	Indicators	Deprived if:	Weights
Education			1/3
	Years of schooling	No household member has completed five years of schooling	[1/6]
	School enrolment	At least one school-age child (years 6 to 11) is not attending school	[1/6]
Health			1/3
	Nutrition	At least one adult or child is malnourished	[1/3]
Standard of living			1/3
	Electricity	Household has no electricity	[1/18]
	Sanitation	Household's sanitation facility is not improved or is shared	[1/18]
	Drinking water	Household has no access to drinking water within walking distance of 30 minutes (round trip)	[1/18]
	Flooring	Household has dirt, sand, or dung floor	[1/18]
	Cooking fuel	Household cooks with dung, wood, or charcoal	[1/18]
	Assets	Household owns no car and no more than one radio, TV, telephone, bicycle, or motorbike	[1/18]

Note: Nested weights are indicated in [ ]

**Table A2** The “integrated” model for measuring poverty, adapted from Beccaria and Minujin (1985) and Katzman (1989)

	Multidimensionally poor	Multidimensionally non-poor
Poor in monetary terms	Poorest of poor (category 1)	Income-poor (category 2)
Non-poor in monetary terms	Overlooked poor (category 3)	Non-poor (category 4)



**Table A3** Correlation matrix for multidimensional poverty indicators and monetary poverty

Indicator	Poor in monetary terms
Years of schooling	0.20*
School enrolment	0.24*
Nutrition	0.68*
Electricity	0.26*
Sanitation	-0.08*
Drinking water	0.22*
Flooring	0.12*
Cooking fuel	0.09*
Assets	0.30*

Note: \* indicates p-value < 0.05

**Table A4** Multidimensional poverty by income quintiles

	Income quintiles				
	(lowest income)	(2)	(3)	(4)	(highest income)
Multidimensionally poor	88%	46%	24%	12%	5%

**Table A5** Deprivation scores by indicator and poverty category

	Poorest of poor (category 1)	Income-poor (category 2)	Overlooked poor (category 3)	Non-poor (category 4)
Years of schooling	0.32	0.09	0.47	0.05
School enrolment	0.33	0.13	0.38	0.06
Assets	0.58	0.42	0.55	0.18
Electricity	0.58	0.47	0.60	0.23
Sanitation	0.12	0.09	0.14	0.19
Drinking water	0.57	0.43	0.59	0.26
Flooring	0.14	0.06	0.17	0.03
Cooking fuel	1.00	0.96	0.98	0.94
Nutrition	0.92	0.01	0.46	0.00
No indicator	0.00	0.01	0.00	0.02
No deprivation except cooking fuel	0.00	0.18	0.00	0.38

**Table A6** Multinomial logit model for household characteristics on probability of household belonging to each poverty category

Variable	Multinomial logit coefficients			
	Poorest of poor (category 1)	Income-poor (category 2)	Overlooked poor (category 3)	Non-poor (category 4)
Household head [Male]				
<i>Female</i>	0.12 (0.429)	-0.05 (0.831)	0.27 (0.136)	
Area [Urban]				
<i>Rural</i>	0.37 (0.000)	0.47 (0.002)	0.64 (0.000)	
Altitude [Lowland]				
<i>Midland</i>	0.24 (0.007)	0.05 (0.745)	0.32 (0.000)	
<i>Upland</i>	0.30 (0.001)	-0.18 (0.224)	0.23 (0.046)	
Region [Central]				
<i>Northern</i>	-0.50 (0.000)	0.04 (0.757)	-0.44 (0.000)	
<i>Southern</i>	-0.55 (0.000)	-0.38 (0.004)	-0.26 (0.016)	
Ethnolinguistic families [Lao-Tai]				
<i>Mon-Khmer</i>	1.71 (0.000)	0.72 (0.000)	1.40 (0.000)	
<i>Sino-Tibetan</i>	1.55 (0.000)	-0.12 (0.746)	2.66 (0.000)	
<i>Hmong-Mien</i>	1.58 (0.000)	0.81 (0.000)	1.95 (0.000)	
<i>Other</i>	0.30 (0.511)	0.07 (0.929)	1.22 (0.003)	
Market access [Middle]				
<i>High</i>	-0.40 (0.000)	-0.31 (0.030)	-0.21 (0.065)	
<i>Low</i>	1.06 (0.000)	0.56 (0.000)	0.60 (0.000)	
Constant	-2.30 (0.000)	-2.95 (0.000)	-3.10 (0.000)	
Observations	7926	7926	7926	7926

Note: The table presents multinomial logit coefficients. The dependent variable are the poverty categories with category 4, the non-poor as base category. The reference categories are in brackets, p-values in parentheses

### Appendix Figures

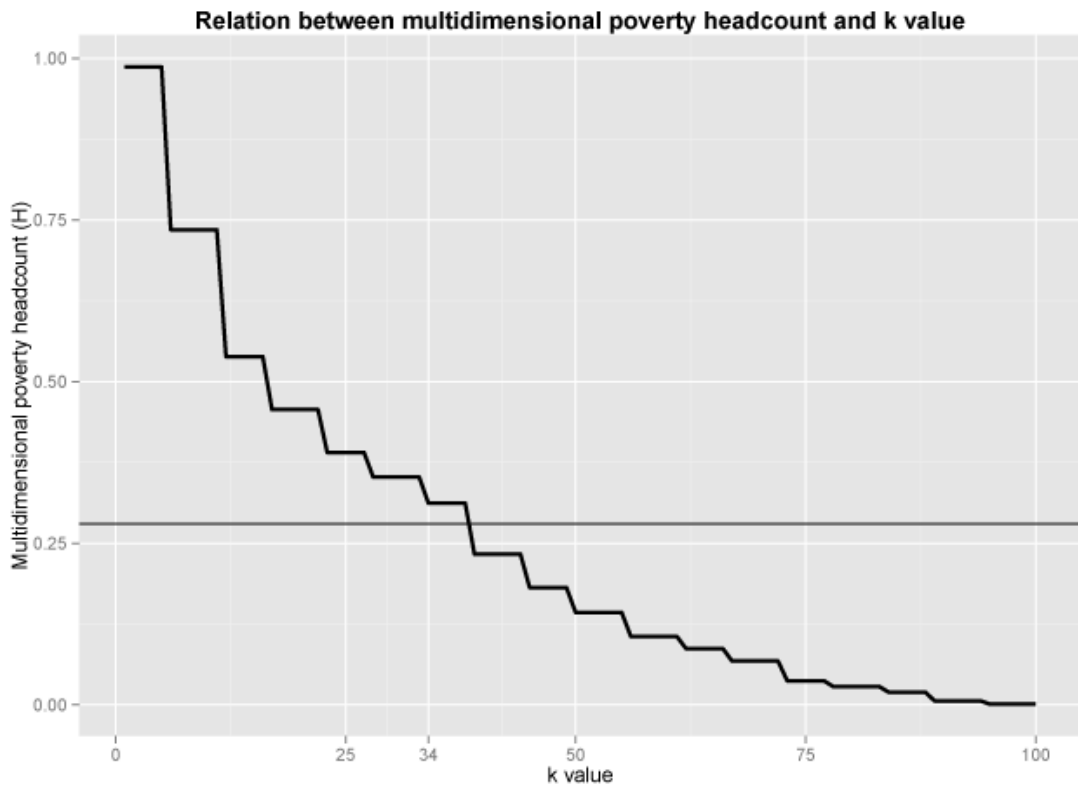


Figure A1: Relation between multidimensional poverty headcount and k value

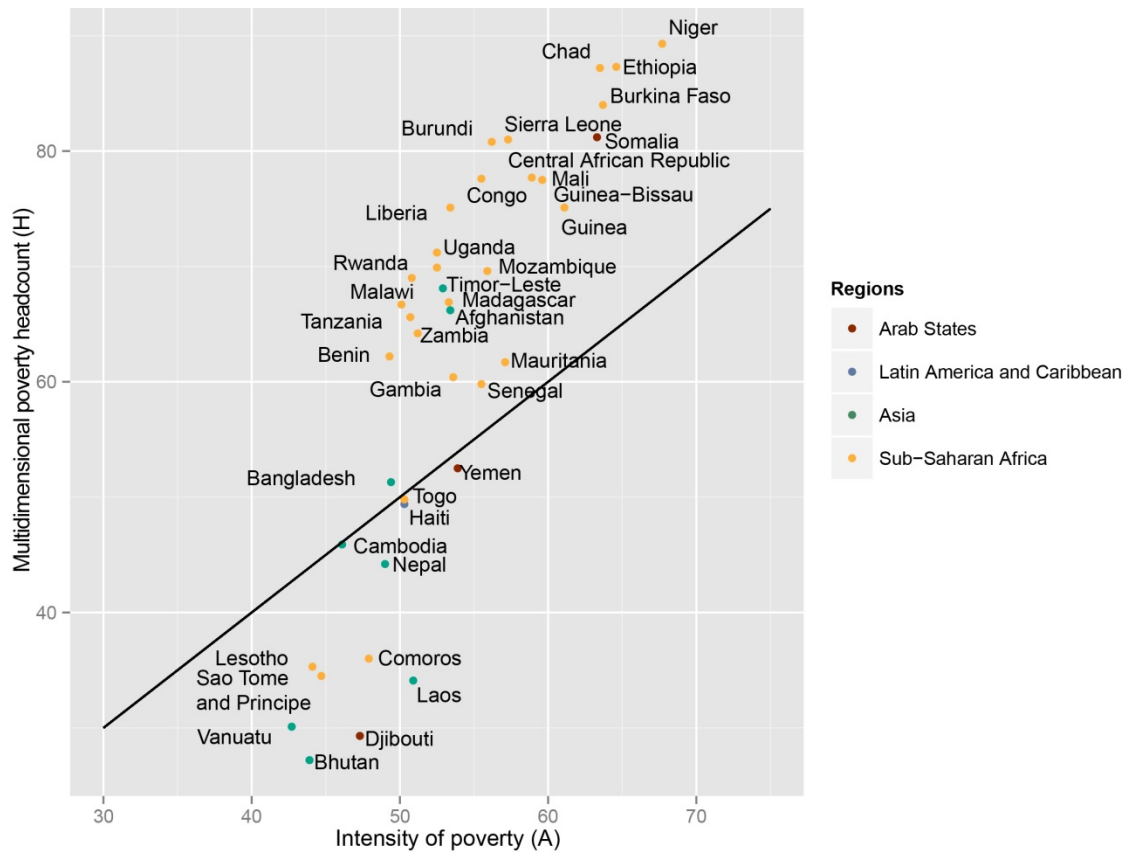


Figure A2: Scatterplot of the two MPI components – the multidimensional poverty headcount (H) and the intensity of poverty (A) – for selected least developed countries

## Notes

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<sup>1</sup> The continuous evolution of differences in the cost of living across the world necessitates periodical updates to the global monetary poverty line. As of 2008, the World Bank used USD 1.25 as the global poverty line. Although this was updated to USD 1.90 in October 2015, this study refers to the USD 1.25 poverty line, since the data used for the analysis are from 2008.

<sup>2</sup> School starting age in Laos is six. In Laos's current educational system, primary school comprises five years of schooling and is compulsory. This is followed by three years of lower secondary, three years of upper secondary, and then three to seven years of post-secondary education. For the purpose of this study we define school age as lasting from six to eleven years of age.

<sup>3</sup> A poverty identification of  $k = 1$  is in line with the union approach, which defines poverty as deprivation regarding only one indicator. At the other extreme,  $k = d$  corresponds to the intersection approach, which defines poverty as deprivation regarding all indicators at once, meaning that a person is considered poor only if he or she is deprived with regard to all indicators.

<sup>4</sup> According to the classification of Foster (2006), the headcount ratio does not fulfil the dominance axioms of monotonicity and transfer. A poverty measure that does not fulfil these axioms is unsustainable because it encourages policymakers with a limited budget to assist the marginally poor rather than the severely poor.

<sup>5</sup> While both income and consumption have advantages as measures of welfare, consumption is often preferred for both theoretical and practical reasons (Deaton 1997).

<sup>6</sup> Per capita normalization is used to derive individual consumption needs, whereby consumption requirements of the young and elderly are assumed to equal those of adults. This rules out scale economies in consumption and treats all members as adult equivalents, implying that household needs increase proportionally with household size. This assumption is motivated by the absence of credible adult equivalence parameters for Lao PDR (Kakwani et al., 2002)

<sup>7</sup> The Foster–Greer–Thorbecke class of poverty measures enables derivation of the poverty gap ratio, by setting  $\alpha = 1$ , as well as the poverty severity index, by setting  $\alpha = 2$  (Ravallion 1994). These measures were not used in the present study.

<sup>8</sup> Assessment of correlation levels as low, medium, or high was done using “Cohen's benchmarks”, according to which a coefficient of 0.1 denotes a small effect, one of 0.3 a medium effect, and one of 0.5 a large effect (Valentine & Cooper 2003).

<sup>9</sup> Note that the incidence of multidimensional poverty only refers to the multidimensional poverty headcount ratio (H).

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<sup>10</sup> We used a poverty cut-off of one-third of weighted indicators, meaning that a household has to be deprived in at least one-third of weighted indicators in order to count as multidimensionally poor.

<sup>11</sup> The newest data set on the global MPI includes 110 countries (Alkire et al. 2015). We selected all least developed countries for which MPI data were available.