

Multidimensional Poverty Index (MPI): A Study in Indonesian on ASEAN

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Abstract: The level of poverty becomes a measure of the success or failure of a country in achieving human development. Poverty can be measured through a monetary approach by looking at income or consumption carried out by humans and capabilities that can be seen at the level of community welfare. To differentiate between groups of poor people or not based on the defined poverty line. MPI will be a comprehensive measure to see descriptions of people living below the poverty line through the dimensions of health, education, and decent living. Indonesia has a greater MPI value than Viet Nam and Thailand, but is smaller than Cambodia, Lao PDR, and Myanmar. This study aims to be able to compare poverty levels in Indonesia with ASEAN. This study also uses explain research which is aims to verify ten indicators in the MPI in Indonesia. It uses a One-Sample Statistics in SPSS 24. This study uses secondary data obtained from the Indonesian Central Bureau of Statistics, the World Bank, and from other sources. The results showed that the population of Indonesia included in the category of severe poverty is 1.24 percent, vulnerable to poverty is 9.105 percent, the highest figure is Myanmar, Cambodia, and Lao PDR. The intensity of lack is the average percentage of deficiencies experienced by the population living in multidimensional poverty is 40.46 percent, this figure is greater than Thailand and Viet Nam, but smaller than the Philippines, Myanmar, Cambodia, and Lao PDR. This research results also shows that each indicator of ten indicators to create the MPI value of 0.06. Therefore, to reduce the level of poverty the Indonesian government must improve the education, health, and welfare systems of its people.

Index Terms: Keywords: Education; Health; Multy Poverty Index; Living Standard.

I. INTRODUCTION

In general, development a country is understood as a change towards development in a certain aspect. Along with the development of the times, due to increasing human needs will require the development of technology so that humans will leave the old ways of doing his activities. Development is the responsibility of various parties to create and implement it according to their competencies and capabilities. Indeed, development can be understood broadly depending on various perspectives.

A new thought about development places humanity as the subject or center of development. In this case, United National Development Program (UNDP) defines that human development is a process to determine and expand its choices. To meet human needs through the development process of various aspects such as the construction of relevant facilities and infrastructure. It can be said that, the purpose of

development is to create and adapt to the environment to achieve human welfare. Of course, regardless of the achievement of its objectives, human quantity and quality will be needed so that it is closely related to human development. Continued efforts made by every country to achieve a better life through quality human development.

Based on the changes and dynamics of the global economy rapid, will be created intense competition between world economic regions. On this basis, encouraging ASEAN countries to accelerate their economic growth to reduce poverty levels of members for Southeast Asian countries. The establishment of the Asean Economic Community (AEC) will give strength to ASEAN countries towards the Asian economy. The main objective is to reduce poverty levels in order to achieve complete human development for the population in Southeast Asian regions.

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Every country in the world wants to achieve a better life through reducing poverty levels with the aim for improving quality human development. To achieve this goal requires a long process for to achieve of quality human life. Poverty is one measure of human development in a country. Developed countries have low poverty rates. Conversely, as one of the characteristics of a developing country is the high level of poverty. Every country in the world has different problems to reduce of poverty to improve human development in their country.

Some indicators in the level of poverty such as health, education, and living standards. Indonesia has a knowledge index is the lowest in the ASEAN-5 (Indonesia, Brunei Darussalam, Malaysia, Singapore, and Thailand) (Bangun, 2014). The education sector in Indonesia still lacks serious attention from its government. The mean years schooling time in Indonesia is only eight years (World Bank, 2016), this condition is very concerning for the Indonesian people. In the dimensions of living standards, Indonesia is at the lowest in ASEAN-5 or slightly above Philippines (Bangun, 2014).

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Indonesian low per capita income will result in low levels of health and education, thus impacting productivity. The results research of Bangun (2014) show that the health index in Indonesia is the low more than Singapore, Malaysia, and Thailand. The low life expectancy shows that the low level of health in Indonesia. Based on the results of studies from the health aspect, the highest mortality rate in Indonesia is premature birth children who could be prevented through health promotion. Based on these reasons, this study aims to knowledge the magnitude of the multidimensional index of poverty in Indonesia and its comparison to other countries in ASEAN. In addition, this study also aims to verify ten indicators (years schooling, school attendance, child mortality, nutrition, electricity, sanitation, drinking water, floor, cooking fuel, and assets) in the MPI in Indonesia.

II. LITERATURE REVIEW

A measure of development in a country is a low level of poverty, therefore every country wants to avoid of poverty. The concept of poverty is often understood through a monetary approach, namely the ability of households to meet basic and non-main needs. In general, people perceive that the poor or not poor are measured by income, consumption, household expenditure shows the level of deprivation. Nolan and Whelan (1996) see that the poverty limit is determined by the amount of money needed to guarantee a standard of living.

Biro Pusat Statistik of Republik Indonesia (2017) uses the poverty line to measure household poverty. The poverty line refers to the amount of money spent on meeting basic needs for food which is equivalent to 2,100 kilograms of calories per capita per day and basic non-food needs. Population whose expenditure is below the poverty line are category of poor. Food staples are represented by 52 types of commodities (including grains, tubers, fish, meat, eggs and milk, vegetables, nuts, fruits, oils and fats), included in non-basic needs are the minimum needs for housing, clothing, education and health (Biro Pusat Statistik of Republik Indonesia, 2016).

The World Bank (2013) gives the view about poor people refer to certain income standards. UNDP (2000) explained that poverty is a less prosperous population. As a benchmark for measuring the poverty line is determined by the income limit of USD 1.25 Purchasing Power Parity (PPP) and USD 1.5 PPP (World Bank, 2016) applied in Indonesia or USD 1.90 according to UNDP's provisions (UNDP, 2017). This view is more direction at income and expenditure to meet human needs. Therefore, Amartya Sen (2000) gives a broader view of poverty by including factors of health, education, and living standards. These three dimensions will be calculated based on a weighted average as a measure of multidimensional poverty inexpllications.

Public health is one dimension to measure poverty experienced by the people of a country. Health factors can be illustrated by the high mortality rate based on certain age groups. Calculating life expectancy can be used as a comparison to the level of public health in various countries. Numbers that indicate the number of deaths in a certain age group for every 1000 people in that particular age group

occur in an area at a certain time (Central Bureau of Statistics, 2017).

Educational factors are one of the other important indicators that need to be considered in human development to achieve the quality of human life. Education is the responsibility of the state in increasing public enthusiasm to resolve illiteracy and mean of years schooling. Therefore, the government must be responsive to the facilities and infrastructure needed to support the improvement of educational aspects in Indonesia.

A decent standard of living illustrates the level of well-being enjoyed by the population as an impact on the improving economy of a country or region. In a broader range the standard of living is worth describing the level of welfare enjoyed by the population as a result of the increasingly improving economy. A decent standard of living illustrates the level of well-being enjoyed by the population as an impact on the improving economy of a country or region.

In generally Poverty can be classified into primary poverty and secondary poverty. Primary poverty is a shortage experienced by a country's population because primary needs are not met such as minimum food equivalent to 2100 kilocalories per capita per day, schools up to high school graduation. While secondary poverty is related to residents who cannot meet the minimum needs for housing, clothing, and electronics.

A. Multidimensional Poverty Index

Multidimensional Poverty Index (MPI) gives an overview of the multidimensional poverty experienced by the population of a country, both at the multidimensional level to the level of severe poverty. MPI comprehensively provides an overview of the population living below the poverty line. The value of MPI can be compared at the level between countries, regions, villages-cities, ethnicities, and between cultures. As an advanced measure or not a country, region, village-city, ethnicity, and its development from time to time can be known by comparing the MPI value.

MPI was developed by the Oxford Poverty and Human Initiative (OPHI) in 2010 which aims to identify poverty problems in households through the dimensions of education, health, and living standards. Fig. 1 shows that three dimensions consist of ten indicators, the dimensions of health, and education have each two indicators, while the dimensions of living standards are based on six indicators. In a wider understanding of living standards describe the level of welfare enjoyed by the population as a result of the economic recovery. Living standards describe the level of welfare enjoyed by the population as a result of the economic improvement of a country or region.

All indicators are needed to build MPI in households taken from the same household survey. MPI is calculated using weighted weights for each dimension and indicator. Each dimension is given the same weight that is 1/3, as well as every indicator in the dimension is also given the same weight. Each indicator in the health dimension: nutrition and child mortality is given a weight of 1/6. The education dimension consists of two indicators: the mean years of

schooling and children enroled are also given a weight of 1/6. Similarly for the standard of living which consists of six indicators: cooking fuel, sanitation, water, electricity, floor, and assets, each given a weight of 1/18. Everyone will be assessed based on an indicator with a rating range of 0-1 (Setyo Budiantoro, 2013).

	Dimension	Indicators
Multidimensional Poverty Index (MPI)	Health (1/3)	Nutrition (1/6)
		Years of Schooling (1/6)
	Education (1/3)	Child Mortality (1/6)
		Children Enroled (1/6)
	Living Standard (1/3)	Cooking Fuel 1/18
		Sanitation (1/18)
		Water (1/18)
		Electricity (1/18)
		Floor (1/18)
		Assets (1/18)

Fig. 1: The Dimension and indicator of MPI

According to the Biro Pusat Statistik of Republik Indonesia report (2017), in Indonesia it is determined that the MPI value is broken down through 10 indicators, namely: does not have a family member who has completed 9 years of education, has at least one school-age child (up to 9th grade), has at least one member families who are malnourished, have one or more children who die, do not have electricity, do not have access to clean drinking water, use cooking fuel from charcoal fuel, coal or firewood, own a house with a ground floor, do not have a motorized vehicle and only has one of the following items: bicycle, motorcycle, radio, refrigerator, telephone or television.

III. METHODOLOGY/MATERIALS

MPI is a multiplication between the proportion of people who experience poverty (H) and individual poverty intensity (A), using the following formula (OPHI, 2017). To find out the MPI value for each country in ASEAN, it will be used the following formula:

$$\text{MPI} = H \times A$$

If q is the number of poor multidimensional people, n is the total population, and c is the deficiency score of each household, then H and A can be known using the following formula (BPS, 2017).

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

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

$$\text{MPI} = \frac{\sum_1^q c}{n}$$

In this study, poverty was measured using the income limit

used by UNDP, namely PPP USD 1.90 per day and PPP USD 3.10 per day. OPHI determines the limit to differentiate between people of poor and non-poor is one third or 33.3 percent of the weighted indicators. There are three categories of assessment of the poor: the population in the poor category, if the score is below 33.3 percent. If the population has a score of less than 33.3 percent but is greater than 20 percent, it is classified as at risk of becoming a multidimensional poor. For residents whose scores are below 20 percent are included in the poor multidimensional category. The results of this calculation will know the comparison of the value of Indonesian MPI with other countries in ASEAN.

In addition, this research using the type of verification research which aims to verifier ten indicators in the multidimensional poverty index. The data used are ten indicators in MPI, which include years schooling, school attendance, child mortality, nutrition, electricity, sanitation, drinking water, floor, cooking fuel, and assets processed using One-Sample Test on the SPSS 24 program.

IV. RESULTS AND FINDINGS

In ASEAN there are seven countries that have a category of population that is below the poverty line, namely Indonesian, Philippines, Thailand, Cambodia, Lao PDR, Myanmar, and Viet Nams. The poverty rate in the ASEAN region has decreased from 2000 to 2014 (Ponciano Intal, Jr., et all, 2015). Table I shows that the highest MPI values are Lao PDR, Myanmar, and Cambodia with the highest percentage of the poor and income below poverty line. According to World Bank's (2015) approach that used of USD 1.25 and USD 2 PPP, the highest poverty rates is Lao PDR. While, if using the data of national poverty line, Phillipine has highest poverty rates in ASEAN regions (Ponciano Intal, Jr., et all, 2015). While Thailand has the lowest MPI value with the poor population of only 0.79 percent and income below the poverty line of 10.50 percent. Indonesian MPI value is the largest after the Philippines compared to Thailand and Viet Nams. Viet Nams is the successful country for reducing poverty rates, whereas Thailand has the smallest in using the national poverty lines (Ponciano Intal, Jr., et all, 2015). This condition shows that Indonesia is still low on aspects of health, education, and living standards.

Table I. MPI value on ASEAN

Count ry	Years	MPI value	Headcount (%) (H)	Intensity of deprivation (%) (A)
Indone sia	2012	0,066	15,5	42,9
Phillipi nes	2013	0,052	11,0	47,3
Thaila nd	2015/2 016	0,003	0,9	36,7



Cambo dia	2014/2015	0,146	33,0	44,3
Lao PDR	2011/2012	0,174	34,1	50,9
Myanmar	2015/2016	0,134	30,1	44,6
Viet Nams	2014	0,029	7,1	40,7

Indonesia has a multidimensional poor population of 1.24 percent, it is highest than Thailand only 0.13 percent and Viet Nams of 0.74 percent. The contribution of deprivations in every dimension of poverty as a whole complements a comprehensive picture of people living in poverty in Indonesia. Multidimensional poverty in Indonesia is concentrated in rural areas (Executive Summary, 2012-2014). It shows that there are problems with inequality of poverty between cities and villages. Based on the business sector, the highest poverty is in agricultural business (Setyo Budiarto, 2013).

Fig. 2 shows that the percentage of the population in ASEAN countries that fall into the category of severe poverty (scores are 50 percent or more) and the vulnerable to poverty (score between 20 and 33.33 percent). The people who have the highest poverty and the vulnerable to poverty are Myanmar, Cambodia, and Lao PDR. Indonesia has highest poverty after Viet Nams and Thailand, but smaller than the Philippines.

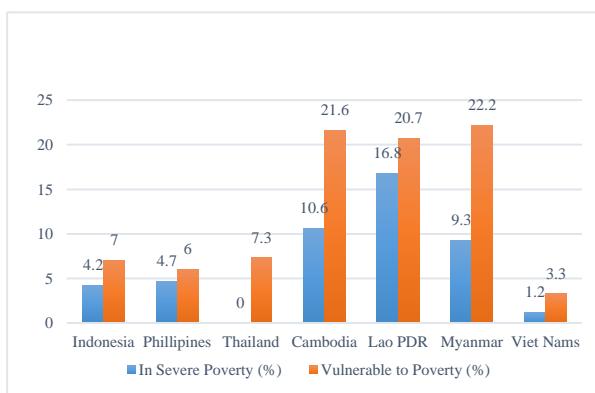


Fig. 2. Poverty Category in ASEAN.

A. Comparison of MPI with other Poverty Indicators

Fig. 3 shows that the poverty indicators can be used such as the National Poverty Line which is calculated based on the World Bank provisions by using income per capita converted by PPP with USD 1.90, and USD 3.10, the national poverty rate and line, and MPI (H). When using USD 1.90 indicator the poor population in Indonesia is lowest if compared with other indicators. While, if using USD 3.10 indicator will be highest contribution on poor population, it numbers the highest in ASEAN after Lao PDR and Phillipines. When using the MPI (H) approach, the number of poor people in Indonesia reaches 15.5 percent. When referring to the national poverty line, the poor population in Indonesia reaches 11.30 percent. This condition can be compared with other countries in Southeast Asia that the largest overall poor population is Lao PDR, followed by Myanmar, and

Cambodia. While the lowest poor population are Thailand, Viet Nams, Indonesia, and Philippines.

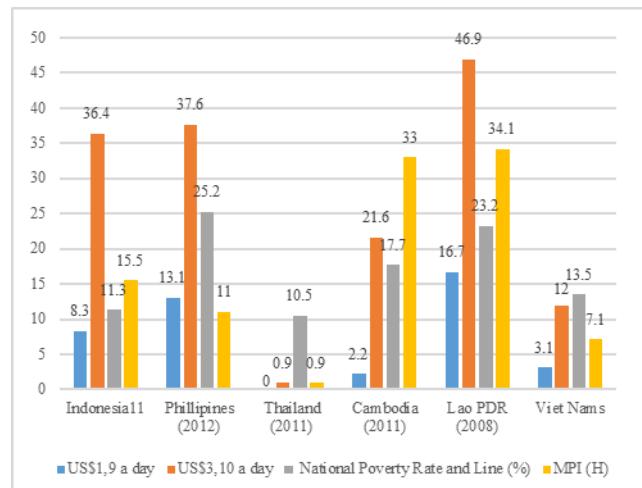
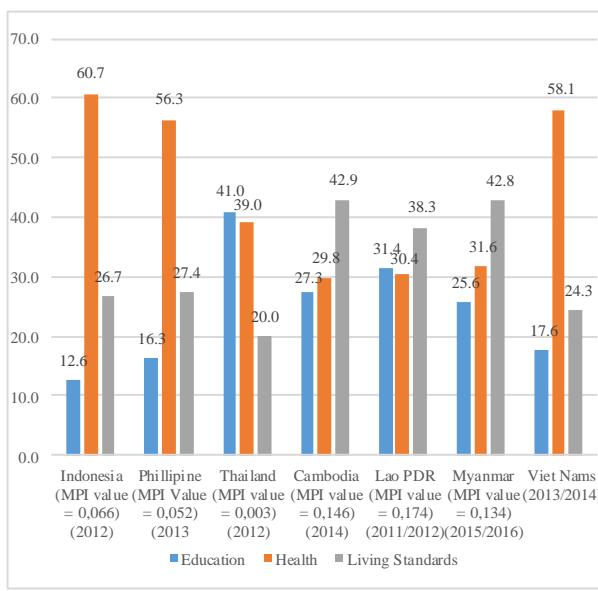


Fig. 3. Poverty of Mesure in ASEAN

In Indonesia have ten indicators to measure three dimensions of MPI such as health, education, and living standards. Each indicator reports to the poor and shortage. Fig. 4 shows that there are three dimension to creating the Indonesian MPI value which is the dimension of living standard is the biggest contributor. Then, the dimensions of education and health are the second and third largest contributors to the MPI value. The education dimension of Indonesia have increased for twenty years lately. Literacy rates increased from 80 percent in 1990 to 93 percent in 2013. However, it stills relatively low when compared to Singapore, Malaysia and Thailand (Bangun, 2014). In Indonesia, the mean years of schooling are eight years (UNDP, 2014), this condition still has not reached the target of twelve years as planned. The high rate of child mortality experienced reflects the low health services resulting from malnutrition. These two indicators are part of basic health that is absolutely accessible to households (Setyo Budiantoro, 2013). The situation also is experienced by other Southeast Asian countries such as Cambodia, Lao PDR, Myanmar, and Viet Nams, Phillipines, and Thailand.



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Fig. 4: The Contribution of each dimension on MPI value in ASEAN region.

According to data from world bank (2015) shows that in ASEAN region the health of infants and children under five years experienced increased, evident that the decline of mortality rates of infant and children under five years from 2000 to 2013. Thailand was successful in reducing of newborns mortality rates, while Cambodia was successful in reducing of the mortality rates of infant and children under five years (Ponciano Intal, Jr., et all, 2015). In generally, each country in ASEAN the experience increasing on mortality rates of infant and children under five years. Be different with Brunei Darussalam, it has highest mortality rates for infant and children under five years (Ponciano Intal, Jr., et all, 2015).

In the dimension of living standards, Indonesia is highest in ASEAN-5 or slightly above the Philippines. Indonesian per capita income is only US \$ 7,500 per year in 2015 (World Bank). The low income of the Indonesian people will result in low health and education, thus affecting productivity. Overall, almost all indicators are still under ASEAN-5 resulting in a low quality of life for the Indonesian people.

Fig. 5 shows that the MPI value of Indonesia dominated by child mortality indicator. Although such the other indicators also influence MPI values, such as cooking fuel, sanitation, school attendance, mean years schooling, and drinking water. In Indonesia have four multidimensional poverty characteristics related to living standards, namely lighting, clean water, sanitation and fuel for cooking (Executive Summary Initiative, 2012-2014).

The bar chart in the left Fig. 5 shows that in Indonesia dominated by indicator mortality is biggest contributor on MPI value. The radar diagram in the right shows same with other ASEAN countries that indicator mortality was the biggest contributor on health dimension. Then, other indicator is sanitation (no data for sanitation in Indonesia) for creating health dimension. In generally, the health dimension is biggest contributor on MPI value in ASEAN region. This dimension is reflected in low per capita income so that it is not enough to meet the needs of life. There are dominated by

cooking fuel, the population in the poor category when in cooking fuel, if the household uses charcoal or wood (Setyo Budiantoro, 2013). Another indicator of the biggest contributor to this dimension is sanitation, it is residents must have access to sanitation with toilet or toilet type requirements, or well-ventilated or compost toilets, provided that they are not shared (Setyo Budiantoro, 2013).

Then drinking water, residents must have access to clean drinking water with conditions: water pipes, public taps, boreholes or pumps, protected wells, protected by semi or rainwater, and that is within 30 minutes walking distance (return) (Setyo Budiantoro , 2013). During the period from 2012 to 2014, it is around eight out of ten households lacked access to lighting sources, nutrition, and floors made by soil, sand or dirt (Executive Summary, 2012-2014). Likewise, residents still do not have more than one radio, TV, telephone, bicycle, motorcycle or refrigerator, and do not own a car (Setyo Budiantoro, 2013).

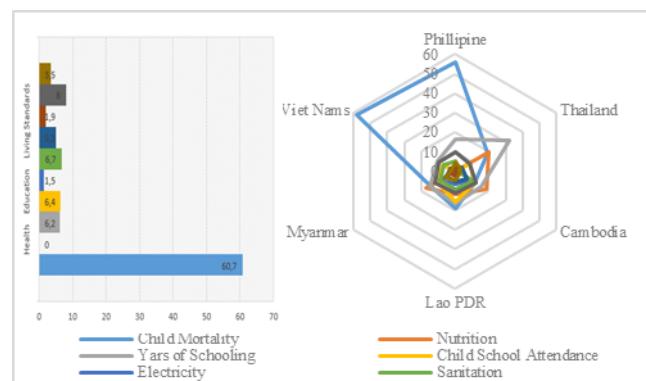


Fig. 5: The Contribution of each dimension on MPI value in Indonesia and its comparison to other countries in ASEAN.

Table II is the result of processing data from ten indicators in MPI using One-Sample Statistics in SPSS 24 with significant results. This shows that the value of each indicator of ten indicators to create the MPI value of 0.06. Indonesia has a high value for the health index, education for creating MPI values in Indonesia. High child mortality rates illustrate the low level of health in Indonesia. Likewise, the education factor is low, which is a school year of 7.8 years, which illustrates the lack of fulfillment of minimum requirements for education. Both of these factors, a high health and education index, illustrate that not yet been met the minimum requirements for primary needs so that resulting in high primary poverty. In addition, not yet been met the minimum requirements for secondary needs in the form of housing, clothing and electronics have not been fulfilled, causing secondary poverty. Atkinson (1975) which states that poverty connects social and life standards in certain societies. Based on ten indicators in MPI, primary poverty is of particular concern by the Indonesian government.

Table II. One-Sample Test

Test Value = 10

	t	df	Sig. (2-tailed)	95% Confidence Interval of the Difference		
				Mean Difference	Lower	Upper
					9.94000	-9.9400
MPI value	-1.61 2E19	9	.000	-9.94000	-9.9400	-9.9400

V. CONCLUSION

MPI identified several deficiencies in the household through the dimensions of health, education, and living standards by using ten indicators, namely years schooling, school attendance, child mortality, nutrition, electricity, sanitation, drinking water, floor, cooking fuel, and assets. The value of each indicator has been confirmed using one sample statistic in SPSS 24 is significant. These results prove that the value of ten indicators will determine the MPI value in Indonesia. Therefore, Indonesia must decrease value of these ten indicators to reduce or stop poverty in Indonesia.

There are seven countries in ASEAN that have poor and disadvantaged populations, namely Indonesia, Philippines, Thailand, Cambodia, Lao PDR, Myanmar, and Viet Nams. The highest MPI values in ASEAN are Lao PDR, Myanmar and Cambodia. While Thailand is the lowest among other ASEAN countries. Indonesian largest MPI value after the Philippines compared to Thailand and Viet Nams, this condition illustrates that Indonesia is still low on aspects of health, education and living standards. The people who have the highest poverty and are vulnerable to poverty are Myanmar, Cambodia and Lao PDR. Indonesian position for poverty is after Viet Nams and Thailand, but smaller than the Philippines. In Indonesia overall, each indicator in each dimension contributes significantly to the value of MPI. Therefore, it is recommended to the government of the Republic of Indonesia to improve the education system and health services to the community.

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