

RELATIONSHIP BETWEEN SANITATION ACCESS AND POVERTY RATE: A CASE STUDY IN CENTRAL JAVA PROVINCE

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Abstract

The Millennium Development Goals (MDGs) shows the interdependent relationship between sanitation and poverty rate. In addition, the development and improvement of sanitation aspect will indirectly reduce poverty. This study is aimed to investigate the relationship between sanitation and poverty in several cases occurring in all regencies/municipalities in the central Java Province.

The results show that the factors affecting sanitation are the per capita gross regional domestic product (PGRDP), income distribution, and the cultural awareness of household on health related to sanitation. Further, household sanitation accessibility could affect the economic and social aspects such as poverty rate and the gross regional domestic product per capita. This study also shows that Banyumas, Purbalingga, Banjarnegara, Purworejo, Wonosobo, Rembang, Demak, Pekalongan, Pemalang, and Tegal are some regencies/municipalities in Central Java province whose sanitation access is less conducive.

Keywords: *Human Development Indexes, Sanitation, Millennium Development Goals, Poverty, GRDP per capita*

INTRODUCTION

Human Development Index (HDI) is an indicator that is used to systematically and comprehensively analyze the status of social economic development both in developing and developed countries. Human Development Index (HDI) ranks of all countries from zero scale (the lowest human development performance) up to one (the highest human development performance) based on three criteria or the final result of development, namely: (1) living resistance that is measured based on birth life expectancy; (2) knowledge that is measured based on the approximate

illiteracy rate of adults and school period rate (3) Quality of living standard that is based on real income per capita adjusted to PPP Purchasing Power Parity.

The United Nation Development Program (UNDP) then succeeds in implementing Human Development Index (HDI) to categorize all countries into three big groups. The first group consists of countries with low human development rate (0,0 – 0,5), moderate (0,51- 0,79), and high (0,8 – 1). In this case, the Human Development Index (HDI) merely measures the human development rate relatively (not absolutely). In addition, it focuses on the

final result of life resistance and knowledge, not the infrastructure process (GNP/capita).

Human Dimension in the Indonesian Development

The development goals of social economic growth in a country are expected to become human-oriented and human rights. The "human" dimension in the Indonesian development becomes the priority in the beginning of Repelita I through the national development strategy "The economic growth is as fast as that of the human resources". This development strategy emphasizes on the entire human development as the main purpose of the national development through the development of human resources to participate as a subject in the development.

In the Indonesian development context, paradigm shifts from the *basic needs development to human centered development*. The development concept has been pioneered since the paradigm of "*basic needs development*" with the use of *Physical Quality Life Index*. *Physical Quality Life Index* has three parameters: baby death rate, birth life expectancy rate, and illiteracy rate. Further, these indicators grow when the development paradigm turns to be "*human centered development*".

The development use of HDI number in Indonesia is conducted by Bappenas in cooperation with the UNDP. The human development is assumed as a *public choice* in fulfilling the most important and basic needs. Later, this is used as the basic pattern of human development measure. There are three urgent choice needs--being healthy and live longer, educated, and easy access for resources to live appropriately. These three choices are supported by other choices such as political freedom, human rights and *personal self-respect*. To measure those choices, three parameters are correspondingly used: (1) health rate and

Life Expectancy rate; (2) education that is measured by illiteracy rate and school period rate; and (3) income that is measured by the *purchasing power parity*.

Those three parameters are then called as Human Development Index. They are, in fact, the development of international Human Development Index (HDI). The Indonesian HDI is conducted from regencies/municipalities. From the HDI enforcement, the national and regional development is expected to accommodate the human dimension well.

Human Resource Development should be done early in the beginning. Human as a resource and a basic asset of development should come from good families in order for the children to grow healthy and intelligent and become qualified Human Resource. Early human resource development through children intervention is called as Early HRD. On the other hand, HRD during productive age is called productive HRD.

In Indonesia, the successful process of human development requires strong commitment that includes regional development planning as well as the government's *political will* on human development dimension. The efforts and development of HDI during the planning process becomes an important issue to be addressed because human resource development process needs sensitive indicator, accurate data, and sufficient fund. In addition, this process requires similar understanding and commitment between the central and regional government and inter-sectoral.

In this regional autonomy era, the regional government tends to prioritize on increasing the Regional Own Income, rather than the human development. This clearly shows that the regional government less understands the importance of human resource development which is actually the

region assets. The development emphasis on increasing the Regional Own Income results in the decreasing of real income per capita (Kuncara, 2005).

SANITATION DEVELOPMENT IN INDONESIA: THEORY AND EMPIRIC EVIDENCE

One indicator of HDI is the health rate and *Life Expectancy rate*. High health rate, in addition, should be supported by health facilities and good sanitation. The sanitation development can be divided into three fields (Soeranto, 2004), namely waste recycle development, chemical waste processing, and *drainage*. The development of these three sanitation field is an effort to improve the society health and its environment. The success of the development can be measured from one of the HDI indicators, that is *Life Expectancy rate*.

However, the sanitation development in Indonesia faces some impediments on the society's minimum income which correspondingly influence the low society awareness of sanitation development. The low society's income will be allocated to fulfil their basic needs whereas sanitation development is regarded unimportant.

Theoretically, sanitation development is included in the *Millennium Development Goals (MDGs)* that contain 8 goals and 18 targets. Based on the 7 goals of *Millennium Development Goals (MDGs)*, continuous environment management has three targets

as shown in Table 1. In target 10 and 11, there are relationship between drinking water access and society's basic sanitation with poverty rate. *Millennium Development Goals (MDGs)* illustrates the interdependence between drinking water access and sanitation with poverty level. Sanitation development and renovation will accordingly lessen poverty which results in the fund availability to build and repair sanitation and drinking water access. Figure 1 describes the patterns of environment sanitation development access and other aspects.

Empirically, according to Soeranto (2004), sanitation development can increase the society's health and environment in which its success indicator is always measured by life expectancy index, baby death rate, and *Water-Borne Disease* such as blood dengue, typhus, and diarrhoea. From the very beginning in 1980, *Water and Sanitation Decade* in Indonesia faces several impediments on the society's minimum income which is allocated to build the basic needs.

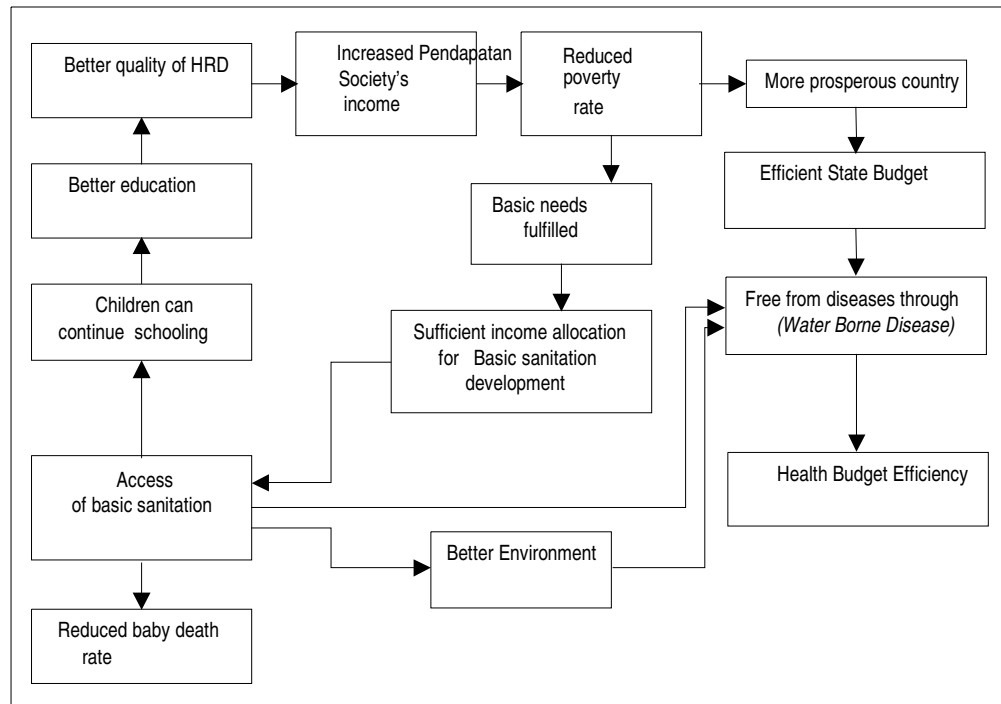
Meanwhile, according to Mungkasa (2004), quality improvement and drinking water access and sanitation can increase the inhabitants' prosperity meaning the decrease the poverty rate. Mungkasa's research (2004) is supported by Samudro's research on the relationship between household sanitation access with the poor level household and GRDP per capita in Indonesia with 30 provinces in Indonesia.

Table 1: 7 Millennium Development Goals (MDGs) – Continuous Environment Management

7 Goals	Content
Target 9	To integrate continuous development principles into national policy and program and return the lost environment resources
Target 10	To reduce half of the inhabitants who do not have drinking water access and basic sanitation by 2015

Target 11	To obtain significant improvement of 100 millions poor inhabitants in slum areas by 2020
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Source: Workshop of *Millennium Development Goals*, Jakarta, 2004



Notes: arrows show influence relationship

Source: Workshop of *Millennium Development Goals*, Jakarta, 2004

Figure 1: The impact of development of environment and sanitation access on other aspects

RESEARCH METHOD

This research is the development of previous research on the relationship between sanitation access and poverty rate as well as GRDP in Indonesia. The research shows that there are 10 provinces with inappropriate sanitation access; one of them is Central Java. Therefore, this research is conducted in Central Java for several aims: (1) to more comprehensively describe inappropriate sanitation access at regencies/municipalities level in Central

Java; (2) to organize sanitation development priority scale at regencies/municipalities in Central Java.

Four-Quadrant Qualification Typology Method is employed to analyze the relationship between sanitation access and poverty level in Central Java Province. This method describes the condition of the sanitation access and poverty rate in 30 regencies/municipalities in Central Java (model 1). This method will also be used to describe the condition of sanitation access

and gross regional domestic income in 35 regencies/municipalities in Central Java Province (model 2). Both models is used for basic analysis and priority scale of sanitation access planning.

Table 2: Classification Typology Model of Regency/Municipality about the Relationship between Sanitation Access and Poverty Rate

Below Average Poverty Rate	Regency/Municipality Group A	Regency/Municipality Group C
Above Average Poverty Rate	Regency/Municipality Group B	Regency/Municipality Group D
	Below Average Sanitation Access	Above Average Sanitation Rate

Table 3: Classification Typology Model of Regency/Municipality about the Relationship between Sanitation Access and Gross Regional Domestic Product per Capita (GRDP/capita)

Above Average GRDP/capita	Regency/Municipality Group 1	Regency/Municipality Group 1
Below Average GRDP/capita	Regency/Municipality Group 2	Regency/Municipality Group 2
	Above Average Sanitation Access	Below Average Sanitation Access

RESULTS AND DISCUSSION

To analyze and to discuss the relationship between sanitation access and poverty rate in Central Java, the data of households that have sanitation access and the percentage of poor inhabitants in 35 regencies/municipalities will be used. Table 4 shows the result of province typology using model 1. Table 4 also shows that regency/municipality of Group D

(Banyumas, Pubalingga, Banjarnegara, Purworejo, Wonosobo, Rembang, Demak, Pekalongan, Kendal, Pemalang, Tegal, and Brebes) are regencies with households that have below average sanitation access and above average poverty rate. Based on the theory, the development and improvement of sanitation access will indirectly reduce poverty.

Table 4: Result of Classification Typology of Regency/Municipality about the Relationship between Sanitation Access and Poverty Rate in Central Java

Below Average Poverty Rate	Regency/Municipality Group A	Regency/Municipality Group C
	Kota Magelang; Kota Surakarta; Kota Semarang; Kota Salatiga; Kota Tegal; Kota Pekalongan; Karanganyar; Kudus; Jepara; Sukoharjo; Boyolali	Magelang; Temanggung; Batang; Kab.Semarang
Above Average Poverty Rate	Regency/Municipality Group B	Regency/Municipality Group D
	Cilacap; Kebumen; Klaten; Wonogiri; Sragen; Grobogan; Blora	Banyumas; Purbalingga; Banjarnegara; Purworejo; Wonosobo; Rembang; Demak; Pekalongan; Kendal; Pemalang; Tegal; Brebes
	Above Average Sanitation Access	Below Average Sanitation Access

Source: Processed Data

Table 5: Result of Classification Typology of Regency/Municipality about the Relationship of Sanitation Access and GRDP per capita in Central Java

Above Average GRDP/capita	Regency/Municipality Group 1	Regency/Municipality Group 3
	Cilacap; Klaten; Karanganyar; Kudus; Kota Surakarta; Kota Salatiga; Kota Semarang	Kab. Semarang; Kendal, Brebes
Below Average GRDP/capita	Regency/Municipality Group 2	Regency/Municipality Group 4
	Blora; Grobogan; Sragen; Wonogiri; Sukoharjo; Kebumen; Pati; Jepara; Kota Magelang; Kota Tegal; Kota Pekalongan; Kota Magelang;	Banyumas; Purbalingga; Banjarnegara; Purworejo; Wonosobo; Magelang; Rembang; Demak; Temanggung; Batang; Pekalongan; Pemalang; Tegal
	Above Average Sanitation Access	Below Average Sanitation Access

Source: Processed Data

On the other hand, the data empirically shows that the main obstacle of development of sanitation access and household sanitation access is the minimum income. Therefore, model 2 will be used to describe the relationship between household sanitation access and Gross Regional Domestic Product (GRDP)/capita. Model 2 can be supported tools to see the asset amount of household that can be allocated to improve and develop sanitation access.

Further, Table 5 shows that regencies/municipalities group 4 (Banyumas; Purbalingga, Banjarnegara, Purworejo, Wonosobo, Magelang, Rembang, Demak, Temanggung, Batang, Pekalongan, Pemalang, and Tegal) are regencies with households having below average sanitation access and below average GRDP per capita. This phenomenon will construct a hypothesis that the factors causing the household sanitation access availability in the provinces are low GRDP per capita, poverty (uneven income distribution) and culture awareness factors on health and sanitation. The cultural factor emerges as a

hypothesis because of the phenomenon in the regencies/municipalities group 2. The phenomenon of regencies/municipalities of group 2 shows that although GRDP per capita is below average, the society in the regencies/municipalities of group 2 have sanitation access which is above average. This, therefore, shows that the culture of their sanitation awareness is quite high. This is particularly due to their awareness to allocate their budget to build sanitation access although their income rate is below average.

Based on those 2 classification typology models above, the priority scale of development and improvement of sanitation access in those regencies/municipalities is correspondingly constructed. The priority scale will be constructed by analyzing the regency/municipality group that is classified based on the combination of those models. For example regency/municipality group A1 means that the regency/municipality is in model 1 and at the same time in model 2 at group 1 quadrant.

The priority range of development and improvement of household sanitation access in each regency/municipality is shown in Table 6. Regency/municipality Group D4 (Banyumas, Purbalingga, Banjarnegara, Purworejo, Wonosobo, Rembang, Demak, Pekalongan, Pemalang, and Tegal) becomes the regency/municipality group that get the first priority in term of sanitation access. The condition of sanitation access of regency/municipality group D4 is still below average, whereas the poverty rate condition is above average and GRDP per capita is below average. Cilacap and Klaten Regency (Group B1) have good economic potential and the GRDP per capita is above average. However, the less uneven income distribution may result in above average poverty rate and low awareness of sanitation access.

In contrast, regency/municipality group A1 (Kota Surakarta; Kota Semarang; Kota Salatiga; Kudus; and Karanganyar) become regency/municipality group that have above average sanitation access. In

addition, the province group has the same above average GRDP per capita and below average poverty rate. This shows that the sanitation and economic condition of regency/municipality group A1 is already good and settle down.

An interesting phenomenon occurs in regency/municipality group B2 –Kebumen; Wonogiri; Sragen; Grobogan; and Blora. Although the condition of GRDP per capita is below average and the poverty rate is above average, it does not mean that the regency/municipality group B2 does not pay attention to household health and sanitation access. Similarly, this shows that the cultural awareness factor of health and sanitation in the regency/municipality B2 play significant role towards above average sanitation access. This condition may also show that regions with above average sanitation access do not guarantee to reduce poverty rate and increase GRDP per capita. It clearly means that there are still other factors influencing poverty rate and GRDP per capita.

Table 6: Classification and Priority Scale of Sanitation Access Development

Regency/municipality in Central Java Province

Regency/municipality group	Name Regency/municipality	Description	Scale Priority of Sanitation Development and Solution
A 1	Kota Semarang; Kota Surakarta; Kota Salatiga; Kudus; Karanganyar	regency/municipality group with above average GRDP per capita and below average poverty rate, and have above average sanitation access	Priority Scale 9: include regency/municipality group with settled classification and good sanitation access
A 3	Kota Magelang; Kota Pekalongan; Kota Tegal; Jepara; Sukoharjo; Boyolali	regency/municipality group with below average GRDP per capita and below average poverty rate, and have above average sanitation access	Priority Scale 8. Solution: provide development of regional economic potential; GRDP per capita allocation of household sanitation access
B 1	Cilacap Klaten	regency/municipality group with above average GRDP per capita and above average poverty rate, and have below average sanitation access	Priority Scale 6. Solution: require awareness empowerment of sanitation and health; require GRDP per capita towards household sanitation

			access
B 2	Kebumen; Wonogiri; Sragen; Grobogan; Blora	regency/municipality group with below average GRDP per capita and above average poverty rate, and have above average sanitation access	Priority Scale 4. Solution: economic potential empowerment; good income distribution; GRDP per capita allocation towards household sanitation access
C 2	Batang	regency/municipality group with below average GRDP per capita and below average poverty rate, and have below average sanitation access	Priority Scale 5. Solution: require economic potential empowerment; GRDP per capita allocation to sanitation access; awareness of sanitation and health
C 3	Kab.Semarang	regency/municipality group with above average GRDP per capita and below average poverty rate, and have below average sanitation access	Priority Scale 7 GRDP per capita allocation to household sanitation access; awareness of sanitation and health
C4	Temanggung; Kab. Magelang	regency/municipality group with below average GRDP per capita and above average poverty rate, and have above average sanitation access	Priority Scale 3. Solution: require economic potential empowerment and even income distribution
D3	Brebes; Kendal	regency/municipality group with above average GRDP per capita and above average poverty rate, and have below average sanitation access	Priority Scale 2 Solution: fair income distribution; GRDP per capita allocation to household sanitation access; and awareness of sanitation and health
D4	Banyumas; Purbalingga; Banjarnegara; Purworejo; Wonosobo; Rembang; Demak; Pekalongan; Pemalang; Tegal	regency/municipality group with below average GRDP per capita and above average poverty rate, and have below average sanitation access	Priority Scale 1 Solution: require economic potential empowerment; fair income distribution; GRDP per capita allocation to household sanitation access; and awareness of sanitation and health

Notes: Priority 1-9: list of province group for sanitation access development priority (scale 1 is the most prioritized group)

Source: Processed Data

CONCLUSION

The use of HDI in Indonesia can translate macro economic indicator such as GNP into human development. The concept of human development is also economic concept because one of the strategies in economic development is the development of qualified human asset through education,

health, and secure feeling. One indicator of HDI is the health rate and *Life Expectancy Rate*. High health rate should be supported by health facilities and good sanitation. Sanitation development can be divided into 3 fields: development of garbage processing, chemical waste management, and *drainage*.

Millennium Development Goals (MDGs) describes the relationship between drinking water access and sanitation access towards poverty rate. The development and improvement of sanitation access indirectly reduce poverty rate. Conversely, by reducing poverty rate, the society has income allocated to build and improve their sanitation and drinking water access. The relationship between household sanitation access, poverty rate and GRDP per capita in the Central Java province can be seen from the four-quadrant classification typology model with 35 regencies/municipalities in the Central Java province. The analysis result shows that:

1. The factors influencing household sanitation access in 35 regencies/municipalities in the Central Java province are GRDP per capita, society income distribution, and cultural awareness of health/sanitation.
2. The household sanitation access rate may influence social economic aspects, namely poverty rate and GRDP per capita. However, this does not occur in several regencies.
3. Based on the priority scale of development and improvement of household sanitation access, there are 10 regencies with the first priority scale (the most prioritized). Therefore, it shows that the condition of sanitation access of regencies/municipalities group should be immediately restored. The 10 regencies/municipalities are Banyumas,

Purbalingga, Banjarnegara, Purworejo, Wonosobo, Rembang, Demak, Pekalongan, Pemalang, and Tegal.

Suggestion

The classification typology model of regencies/municipalities is based on the relationship between household sanitation access and economic indicator of GRDP per capita and poverty rate. This, indeed, becomes one step to describe the relationship of human and economic development in a particular area. Thus, to understand this issue in detail and deeper, some ways and methods are still available to do.

The discussion of priority rank of development and improvement of household sanitation access will describe the condition of household sanitation access in other provinces in Indonesia. Therefore, this discussion should not be interpreted plainly that at one time a region is not in the first priority scale so the region does not need development and improvement of sanitation access. Each region in Indonesia will always require development in sanitation field, but the priority may be different. This discussion is an illustration of the condition of sanitation household access that relates with human development as a whole in Indonesia. It is expected that it can become input in term of the development of human resource as that mentioned in the objectives and targets of *Millennium Development Goals*.

REFERENSI

- Anonim, *Indeks Pembangunan Manusia (IPM) Kota Jakarta 1990-1999*, Badan Pusat Statistik (BPS), Jakarta, 2002.
- Anonim., *Data dan Informasi Kemiskinan Propinsi di Indonesia 2004*, Badan Pusat Statistik (BPS), Jakarta, 2004
- Anonim., *Pendapatan Domestik Regional Bruto Propinsi di Indonesia 2004*, Badan Pusat Statistik (BPS), Jakarta, 2004.

- Anonim., *Human Development Report 2004*, UNDP, 2004.
- Chenery & Srinivasan (1989). *Handbook of Development Economics*, Vol 2, Elsevier, New York
- Imawan, W (2002). "Indikator Komposit Pembangunan Manusia: Indikator Sosial Untuk Monitoring Dan Evaluasi Kinerja Pembangunan Sesuai Wilayah Pemerintahan", Badan Pusat Statistik (BPS), Jakarta.
- Kuncara, Harya, (2005). "Pengaruh Transfer Antarpemerintah Terhadap Kinerja Fiskal Pemerintah Daerah, Pertumbuhan Ekonomi, dan Disparitas Pendapatan Regional", (Tidak dipublikasikan).
- Meier, G. M & J. Stiglitz (2001). *Frontiers of Development Economics in the Future Perspective*, Oxford University Press, New York.
- Muhammad, Mar'ie (2003). "Indeks Pembangunan Manusia di Indonesia", Koran Tempo, Jakarta.
- Mungkasa, O (2004). "Sekilas Kondisi Air Minum dan Sanitasi di Indonesia", Media Percik, Jakarta.
- Samudro, Bhimo R (2006). "The Linkages Between Sanitation and Poverty Level: A Human Development Study in Indonesia", *Paper Indonesia Regional Science Association (IRSA), IRSA 8th International Conference*, Malang.
- Soeranto, Dwityo A (2004). "Kualitas Manusia Indonesia dan Pembnagunan Prasarana Sanitasi", Media Percik, Jakarta.
- Sumahdumin & Dudi Abdurahim (2002). "Pemanfaatan Indeks Pembangunan Manusia untuk Perencanaan Pembangunan Daerah", Badan Pusat Statistik (BPS), Jakarta,
- Sumarsono, Soni dan Sahat M (2002). "Index Pembangunan Manusia dan Pemanfaatannya Dalam Pembangunan Daerah", Direktorat Bina Kelembagaan Pembangunan Dirjen Bina Pembangunan Daerah Depdagri dan Otda, Jakarta.
- Toddaro, M. P & Stephen Smith (2003). *Economics Development*, 8th, Addison Wesley, USA.
- World Bank (2001). *The Quality of Growth Kualitas Pertumbuhan 2000 (terjemahan)*, PT Gramedia Pustaka Utama, Jakarta.
- World Bank (2002). *Globalization Growth, And Poverty*, Oxford University Press, New York.
- World Bank (2003). "Sustainable Development in a Dynamic World: Tranforming Institutions, Growth, and Quality of Life" *World Development Report* Oxford University Press, New York.