

What Happened to Village Infrastructure and Public Services During the Economic Crisis in Indonesia?

Jesse Darja
Daniel Suryadarma
Asep Suryahadi
Sudarno Sumarto*

Abstract

Infrastructures play a crucial role in economic development and poverty reduction. The economic crisis in 1997-98 severely curtailed the government's capacity to maintain the existing infrastructures, which could adversely affect the prospects for future economic development and poverty reduction in the country. This study provides an overview of the changes in the availability of village-level infrastructures and public services during the economic crisis. The findings indicate that there were mixed trends in the availability of different types of infrastructures and public services. Furthermore, the changes in the availability of certain infrastructures or public services differ across urban and rural areas as well as between Java-Bali and the outer islands. In the era of regional autonomy, it is essential to involve the regional governments in infrastructure development planning, management, and maintenance. This would relieve some burdens from the central government.

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1. BACKGROUND

The 1997-98 economic crises have brought Indonesia into its worst economic crisis since the 1960s. The *rupiah* began a free fall from Rp 3,000 against the US dollar in August 1997 to around Rp 15,000 in June 1998. This large depreciation in the value of *rupiah* has induced domestic prices to jump. In September 1998, the food component of consumer price index (CPI) reached 261 relative to 100 in January 1997, while the CPIs for housing, clothing, and health CPIs reached 156, 225, and 204 respectively.¹

Although the crisis started as a crisis in the financial and banking sector, it quickly spilled over to the real sector. As a result, real Gross Domestic Product (GDP) dropped by almost 14 percent in 1998 and remained stagnant in 1999.² Private investment was heavily affected by the downturn as real Gross Domestic Fixed Investment fell by 36 percent in 1998.

Since nominal wages rose more slowly than food prices during this period, real income declined. The impact of the crisis on welfare is reflected by the increase in the poverty rate from around 15 percent in the second half of 1997 to 33 percent by the end of 1998.³ Entering 1999, along with the stabilization of the economy, the poverty rate appears to have declined considerably since then.

The economic crisis has produced diverse effects on different groups and regions in Indonesia. A study discovered that the crisis affected urban households worse than rural ones, which is hardly surprising given the origins of the crisis in the financial and banking sector.⁴ A separate study confirmed that the urban poor appear the most adversely affected by the crisis.⁵ The poor in urban areas were the least able to cope with the increase in the costs-of-living due to the increase in prices. In rural areas, some farmers, particularly large farmers, may have profited from the increase in agricultural food prices. However, there was a serious rural crisis, particularly in eastern Indonesia, as a result of a major El-Nino drought, which decreased crop yields substantially in 1997.

¹ Levinsohn *et al.* (1999).

² Strauss *et al.* (2002).

³ Suryahadi *et al.* (2003).

⁴ Poppele *et al.* (1998).

⁵ Levinsohn *et al.* (1999).

In order to obtain an indication of the overall impact of the crisis, another study used the results from a nation-wide *Kecamatan* (sub-district) survey filled by three expert respondents (agricultural officer, school supervisor, and health officer) at each of the 4,025 *Kecamatan* in Indonesia.⁶ The study found that the impact of the crisis was heterogeneous in nature with some regions experiencing difficulties and others doing relatively well. In particular, Java was hard hit by the crisis, while large parts of Sumatera, Sulawesi, and Maluku experienced a minimal negative impact because of the crisis. Moreover, the study discovered little connection between the initial poverty levels and the extent to which an area was hit by the crisis. Some relatively poor areas were not hard hit (e.g. Maluku), while other relatively well-off areas were hit hard by the crisis (e.g. Jakarta).

Despite the importance of infrastructures and public services in economic development and poverty reduction, there is a relative lack of research on the impact of the crisis on infrastructures and public services. This is unfortunate as deterioration in the availability or quality of infrastructures and public services may have long term detrimental effects on economic development and, in particular, on poverty reduction. This study aims to fill this gap and focuses on village-level infrastructures and public services as their availability and quality often directly affects the welfare of the poor.

The rest of the paper is organized as follows. Section two provides a review on the role of infrastructure in economic development in general. Section three discusses the development of infrastructures and public services in Indonesia, in particular at the village-level. Section four explains the data that are used in the analysis. Section five discusses the empirical findings on the changes in village-level infrastructures and public services before and after the economic crisis. Finally, section six provides the conclusion of this study.

2. THE ROLE OF INFRASTRUCTURE IN ECONOMIC DEVELOPMENT

Infrastructure plays a crucial role in economic development and poverty reduction. Lack of access to infrastructures is often identified as a major cause of poverty. Isolated areas are much more likely to become poor areas than areas which are accessible. Likewise, standard of living differentials across regions are often associated with inequality in access to infrastructures.

⁶ Wetterberg *et al.* (1999).

A. Types of Infrastructure

In economics, traditionally infrastructure refers to tangible assets that often combine characteristics such as economies of scale and externalities.⁷ In practice infrastructures are often referred to as physical structures that form the foundation of development. Infrastructures make it possible for people to increase their productivity and improve their welfare. In general, infrastructure can be divided into two main different types: economic and social infrastructure.

Economic infrastructure is a structure that supports economic activities in an area. Examples of this type of infrastructure include roads, irrigation networks, electricity, and communication facilities. Since economic backwardness and poverty are often caused by remoteness and isolation, roads have a very crucial role for economic development and poverty reduction in an area. Similarly, communication facilities have a role in reducing the disadvantages of location and distance. Meanwhile, electrification means that people can use a relatively safe source of energy to go about their daily activities. Electrification also opens up new horizons for people in remote places as they can now see what is outside their world through television, radio, and eventually the internet.

Meanwhile, social infrastructures are facilities that empower people in an area to increase their welfare and productivity. The two most important social infrastructures are education and health facilities. Improved access to both of these social infrastructures increases the quality of human resources in a region or country. People can improve their knowledge and skills through better education, which are essential for productivity and welfare improvements. Likewise, better health status is essential for sustaining the improvements in productivity and welfare.

B. Infrastructure, Economic Growth, and Poverty Reduction

The availability of infrastructure can provide a stimulus for the economy and a platform for economic expansion. Hence, different access to infrastructure across regions in a country is a significant explanatory variable in regional per capita income divergence.⁸ An improvement in the transport infrastructure leads to lower transaction costs, which can have three major effects: (i) the access of economic agents increases and likewise the accessibility of locations increases; (ii) productivity of firms

⁷ van der Linden (2001).

⁸ Alexander and Estache (1999).

and households increases because of the decrease in transaction costs; and (iii) both of the things above will increase the volume and location of activities of firms and households.⁹

A study on the role of infrastructure in India found that the mix between infrastructure and total government spending could significantly affect the long-run growth rate.¹⁰ Furthermore, the findings of another study showed that low and middle-income countries that use infrastructure inefficiently pay a growth penalty in the form of a much smaller benefit from infrastructure investments.¹¹ The study also found that international aid programs aimed only at new infrastructure constructions may have a limited impact on economic growth. In fact, if the constructions divert resources away from the maintenance of existing infrastructures, then the new infrastructures may actually be detrimental to the economy.

The unavailability of infrastructure is often perceived as one of the main causes of poverty. Development of infrastructures and public services could potentially contribute to economic growth by raising workers' productivity and creating jobs, which is why access to adequate infrastructure is necessary in order to eradicate poverty. Since poverty is often associated with low educational attainment and bad health status, improving people's access to education and health infrastructures constitutes the most effective way to reduce poverty in the long run.

DFID (1998) eloquently summarized poor people's need for infrastructure. They explained that basic infrastructure includes the provision of adequate water, sanitation (including human and solid waste disposal and drainage), clean and efficient energy, adequate and secure shelter and public buildings, plus the essential information that enables people to utilize these services effectively. In addition, access is required for services available on a less local basis and mobility through safe, affordable transport (including roads, railroad tracks, and means of transport), which will enable poor people to participate in the economic, cultural, and political institutions of society. Therefore, basic infrastructure provision relates to facilities that directly impact on the sustainable livelihoods and opportunities of poor people within their communities.¹²

⁹ Bruinsma (1995).

¹⁰ Levine and Krichel (1994).

¹¹ Hulten (1996).

¹² DFID (1998).

DFID (1998) also stated that increase in spending on basic infrastructure is insufficient because it has to be ensured that the development of infrastructure benefits the poor more than the rich. In the long run, the maintenance and operation of infrastructure must be developed locally so that it is sustainable. The World Bank stated that equality in access to infrastructure services is important to improve poor people's assets. It also stated that the roles of infrastructure are to create opportunities, to facilitate empowerment, and to reduce risk and vulnerability at household and community levels.¹³

Other studies have found that good governments that invest in essential public services realize high rates of return. Easterly estimated that each additional percentage point of GDP in transport and communication investment increases growth by 0.6 percentage point.¹⁴ The 1997 World Development Report by the World Bank stated that the rate of return to infrastructure projects, such as irrigation and drainage, telecommunications, airports, highways, seaports, railways, electric power, water supply, sanitation, and sewerage averages 16 to 18 percent per year.¹⁵ Another study also found that returns to maintenance spending on existing infrastructure, such as on roads, are even higher.¹⁶

In a nutshell, the purpose of infrastructure boils down to one thing: to increase the quality of people's life. The United Nations Development Program (UNDP) in its first Human Development Report in 1990 wrote that the basic objective of development is to create an enabling environment for people to enjoy long, healthy, and creative lives.¹⁷

3. VILLAGE-LEVEL INFRASTRUCTURE DEVELOPMENT IN INDONESIA

A. Past Developments

The technocratic economic team behind the Indonesian New Order government apparently realized the importance of infrastructure development on economic development in general. Starting in the 1970s up to the 1980s, the government of Indonesia emphasized infrastructure

¹³ World Bank (2001).

¹⁴ Easterly (2001).

¹⁵ World Bank (1997).

¹⁶ Gyamfi (1992).

¹⁷ UNDP (1990).

constructions and rural development as priorities in its development program. There were several major projects that were undertaken during the period, which have changed the availability of village-level infrastructures and public services to a large extent.

One of the *first* such massive projects was the SD *Inpres* (President's Instruction) project.¹⁸ It was launched in 1973 with the aim of providing equal access to primary-level education to all Indonesian school-age children. To achieve this objective, the project built more schools in places where there had been relatively less schools prior to 1973. Specifically, the number of schools constructed in each district in 1973-1975 was proportional to the number of primary school age children not enrolled in school in 1972. It was the largest project by the time it was launched, absorbing 12 percent of the regional development budget in 1973 and increased steadily to reach 28 percent in 1979.¹⁹ Between 1973 and 1979, 61,807 new primary school buildings were constructed, which represented about 222 new schools and 666 new teachers per district. This project had roughly doubled the number of primary schools in Indonesia.²⁰

The *second* massive infrastructure program was the construction of *Puskesmas* (public health centre). Although relatively small compared to the budget allocated for the SD *Inpres* program, by the virtue of this program there have been significant improvements in the availability and access to primary health centres in the regions all over the country.²¹ The number of hospital beds increased from 63,643 in 1973 to 123,168 in 1998, while the number of *Puskesmas* increased from 3,735 in 1974 to 7,602 in 1998.²²

The *third* major undertaking by the government since the 1970s was the massive national program for rice self-sufficiency. One of the most expensive parts of this effort is the expansion of irrigation networks in cultivated lands. Over the period between 1970 and 1984, total irrigated land area increased from 3.7 to 4.9 million hectares, which was subsidized at the cost of US\$440 million in 1989.²³

¹⁸ SD INPRES literally means Presidential Instruction on Primary Schools. See Duflo (2001) for analysis on the impact of this program on the labor market.

¹⁹ The regional development budget itself was accounted for 15 percent of the total budget by 1979.

²⁰ See Duflo (2001) for discussions on this program.

²¹ Duflo (2001) stated that health expenditures were only 3.4 percent of the budget for regional development in 1973 and 5.5 percent in 1979.

²² WHO (2002).

²³ Small (no date).

B. Future Challenges

In 1996, a report by the Economic and Social Commission of Asia and the Pacific of the United Nations (UNESCAP) expected investments in power, transport, telecommunications, and water infrastructures in Indonesia to total over US\$53 billion, of which at least \$18 billion would have to be undertaken by the private sector.²⁴ The UNESCAP's projections did not materialize because of the onset of the economic crisis starting in 1997. In 1998, the growth in infrastructure grounded to a halt. The transportation and communication sectors in that year contracted by 36.44 percent and 15.13 percent respectively, although the electricity, gas, and clean water sector still grew a little by 3.03 percent. Meanwhile, conditions of roads deteriorated due to the lack of maintenance funds.²⁵

Apart from the crisis, infrastructure in Indonesia is also faced with the problems associated with decentralization due to the regional autonomy policy introduced in 2001. At some degree, regional autonomy shifted the responsibility of providing infrastructures to the regional governments, which are relatively inexperienced and do not have adequate resources to even maintain the available infrastructure. This also means that the central government's role is reduced from a budget-allocating role to only a policy-making role.²⁶

The next challenge facing Indonesia is investment liberalization policy. This means now Indonesian telecommunication and transportation companies will have to compete directly with foreign companies. The drinking water service in Jakarta is already operated by a foreign-government joint venture company. Theoretically, this is beneficial to the public because they will enjoy the best service available. However, there could also detrimental effects such as higher prices that have to be paid by the public for these services.

Currently, infrastructure in Indonesia is in dire condition. According to a report released by the World Bank in 2003, Indonesia is lagging behind in almost all infrastructure sectors, which will threaten Indonesia's long-term growth.²⁷ The report mentioned that only 1.3 percent of the population has access to network sewerage, the lowest percentage in Asia. Furthermore, only roughly half have access to

²⁴ UNESCAP (1996).

²⁵ KKPPi (2003a).

²⁶ KKPPi (2003b).

²⁷ World Bank (2003).

electricity and only 9.1 per 100 people in Indonesia own a telephone connection. Only 34 percent of the urban population (or 14 percent of the total population) are served directly by water utilities. In addition, Indonesia's urban centres are clogged with traffic jams due to inadequate public transportation system, unclear regulations, and horrendous road quality; and this condition is taking its toll on the economy. The last issue that the report mentions is that things will continue to get worse for Indonesia if corruption continues to be rampant.

4. DATA AND METHOD

A. Data: The Village Potential (PODES) Survey

This study uses the pre-crisis (1996) and post-crisis (1999) PODES (*Potensi Desa*, or Village Potential) data to evaluate the impact of the 1997-98 economic crisis on village-level infrastructure and public services. PODES is a census of villages, collecting various village level data, ranging from geographic to demographic data, and data on infrastructure and public services (roads, utilities, markets, health centres, and schools) available in each village. The village census is carried out by BPS (*Badan Pusat Statistik*, the government's statistical agency), usually prior to and used as a preparation for a population, agricultural, or economic census.

B. Method

In this study, the term "village" refers to the smallest government administrative unit.²⁸ The term is used uniformly in referring to such units in both urban and rural areas.²⁹ There are 66,484 and 68,783 villages covered in the 1996 and 1999 PODES respectively. The change in number of villages was due to administrative restructuring of villages, involving both splitting up and merging of villages. In addition, data for some villages in conflict areas could not be collected in 1999. Since the changes in infrastructure available within a village could be due to the restructuring, only those villages that did not undergo administrative change and the data of which are available in both census years are included in the analysis. Taking the restructuring effect into account, the

²⁸ In Indonesia, government's administrative units covering the largest to smallest areas are the central, provincial, district (*kabupaten/kota*), subdistrict (*kecamatan*), village governments.

²⁹ A village located in urban areas is referred to as a *kelurahan*, while a village in rural areas is referred to as a *desa*.

total number of villages used for analysis is 48,400 or 73 percent of the total number of villages in 1996.

The variables used for the analysis relate to key public infrastructures and services within the villages. In total, 27 variables of infrastructures and public services are analysed, which are grouped into five categories:

1. *Education*. This category includes six variables: the availability of public and private primary, junior secondary and senior secondary schools.
2. *Health*. This category consists of six variables: the number of healthcare providers (hospitals, community health centres, drug stores) and the availability of health personnel practices (doctors, paramedics, midwives).
3. *Public Utilities*. This category consists of seven variables: the availability of gas/kerosene for cooking fuel, drinking water from improved sources, trash disposal service, percentage of households served by electricity and telephone services, and the availability of public postal services and public telephones.
4. *Transportation*. This category consists of three variables: road surface condition in general (asphalt or non-asphalt), road accessibility to motorized vehicles, and the availability of public motorized transportation.
5. *Business Institutions*. This category has five variables: the availability of shopping complexes and permanent markets, and the availability of banks public and people credit banks (BPR) and cooperatives.

The analysis focuses on the changes in the availability of these infrastructures and public services within the villages. In addition to looking at the total availability, the changes in the availability are also disaggregated by urban and rural areas as well as by Java-Bali and the Outer islands.

5. CHANGES IN VILLAGE INFRASTRUCTURE AND PUBLIC SERVICES

A. Education

Most schools in Indonesia, particularly at the primary level, are public schools. Previously they were administered by the central government's Department of National Education, but now they are administered by

local governments in accordance with the regional autonomy policy since 2001. In addition to these regular public schools, there are also Islamic schools (*madrasah*), which are administered by the central government's Department of Religious Affairs. Alongside these public schools and *madrasah*, there are private schools and *madrasah*, which are established and managed by private foundations.

Even prior to the crisis, the quality of basic education in Indonesia was in general unsatisfactory with schools operating on tight budgets. Many schools were therefore unable to provide sufficient teaching supporting materials, facilities, and pay the teachers adequate salaries.. A much smaller negative economic shock in 1986/87 caused gross enrolment rates to fall from 62 percent to 52 percent at the junior secondary level, primarily due to poor children dropping out of schools.³⁰

With an already weak education system, the 1997 economic crisis further exacerbated the situation. The combination of reduced public funding for education, higher prices of schooling, and lower family incomes resulted in an increased dropout rate, particularly among the urban poor. In the aftermath of the economic crisis, the budget allocation for education dropped from around 7 percent of GDP to approximately 5 percent as priorities shifted elsewhere, forcing the postponement of the targets of the government's nine-year compulsory education program that started in 1994.³¹

As a result of the budget reallocation, many educational projects, such as the construction of school buildings, were suspended. This has been somewhat remedied with the new National Education System law ratified in 2003 that requires the budget for education to be at least 20 percent of GDP in the hope of catching up and making up for all the setbacks suffered by the education sector during the crisis. In reality, however, the implementation of this law is still lacking as the education budget is still way below the mandate stipulated in the law.

The data of school availability at the village level for public and private schools before and after the economic crisis are summarized in **Table 1** and **Table 2** respectively. In total, there is a general tendency for the proportion of villages with schools not to change much between 1996 and 1999, except for the private primary schools, which have declined, and public junior secondary schools, which have tended to increase. However, the trends differ between urban and rural areas, where in rural

³⁰ World Bank (2002a).

³¹ PHPCR (2002).

areas there was a tendency for school availability to expand, while in urban areas fewer villages have schools after the crisis.

Table 1
Proportion of Villages with Public Schools by Region (%)

	SD			SMP			SMU		
	1996	1999	Δ	1996	1999	Δ	1996	1999	Δ
Total	87.5	87.8	0.3	14.6	16.5	1.9	5.1	5.6	0.5
Urban	92.4	91.9	-0.5	34.7	35.3	0.5	21.2	20.6	-0.6
Rural	86.7	87.2	0.4	11.7	13.8	2.1	2.7	3.4	0.7
Urban Java-Bali	96.5	96.1	-0.4	34.7	35.5	0.8	20.3	19.9	-0.4
Urban off-Java-Bali	84.6	83.7	-0.8	34.8	34.9	0.1	23.0	22.2	-0.9
Rural Java-Bali	98.6	98.4	-0.2	12.3	14.5	2.2	2.4	3.1	0.7
Rural off-Java-Bali	77.2	78.1	0.9	11.2	13.3	2.1	3.0	3.7	0.6

Notes: SD = primary school, SMP = junior secondary school, SMU = senior secondary school.

Source: Counted by authors from various sources

Table 2
Proportion of Villages with Private Schools by Region (%)

	SD			SMP			SMU		
	1996	1999	Δ	1996	1999	Δ	1996	1999	Δ
Total	34.9	31.2	-3.7	20.2	20.5	0.3	10.0	10.3	0.3
Urban	53.6	51.5	-2.0	52.4	52.2	-0.3	43.0	43.2	0.2
Rural	32.2	28.3	-3.9	15.6	15.9	0.3	5.3	5.6	0.3
Urban Java-Bali	57.7	55.2	-2.4	56.1	55.7	-0.5	44.2	44.9	0.7
Urban off-Java-Bali	45.6	44.4	-1.2	45.2	45.4	0.1	40.6	39.7	-0.9
Rural Java-Bali	45.1	39.8	-5.3	20.0	21.2	1.2	6.5	7.1	0.6
Rural off-Java-Bali	21.9	19.1	-2.8	12.0	11.6	-0.4	4.3	4.4	0.1

Notes: SD = primary school, SMP = junior secondary school, SMU = senior secondary school.

Source: Counted by authors from various sources

In the case of primary schools (SD), all regions experienced a decrease in school availability, except for public primary schools in rural areas off-Java-Bali. Public junior secondary schools (SMP) appear to have increased in all regions, although the increase is much higher in rural areas. The availability of private SMP, however, declined in urban Java-Bali and rural off-Java-Bali. For senior secondary schools (SMU), urban areas again experienced a decline in the availability of public SMU. Furthermore, in urban areas off-Java-Bali, the availability of private SMU also declined.

A survey by the World Bank found a marked shift from private to public schools during the crisis.³² The shift is due to the fact that private schools in general charge higher fees than public schools and that the government has just completed a building program that expanded the number of schools in rural areas. The shift from private to public schools might explain the percentage decline in private primary schools availability between 1996 and 1999.

The increase in the number of public schools in rural areas is also reflected by the increase in the percentages of villages with public SMP. The World Bank survey reported that in 1998, public junior high school enrolments increased by 2.1 percent while private junior high enrolments decreased by 10 percent. In the case of primary schools, public enrolments decreased by 1.1 percent, while private enrolments decreased by 4.4 percent.

B. Health

Similar to the case with schools, many health facilities in Indonesia are publicly owned and funded. Basically there are three types of health facilities for which the data are available in *Podes* : hospitals, which provide extensive health services and are only available in urban centres; *Puskesmas* (primary health centres), which provide relatively less comprehensive services beyond basic services and immunization, but scattered in more places all over the country; and drugstores/pharmacies.

In the three decades prior to the crisis, Indonesia had achieved significant progress in health care. Infant mortality rate (IMR) declined from 124 per 1000 live births in 1967 to 41.4 per 1000 live births in 1997, mainly due to an increase in the general welfare of the population over the period and continuous efforts by the government to increase access to health services.³³

³² Filmer and Sayed (1999).

²⁵ World Bank (2002b).

However, despite the relative improvements, the standards of health services in Indonesia remain low compared to neighbouring countries. There is a shortage of medical and paramedical personnel, particularly in rural areas that are isolated and inaccessible. The collapse of the *rupiah* in the 1997 crisis sharply increased the prices of drugs (including vaccines and contraceptives), of which an estimated 60 to 80 percent are imported.

Table 3 summarizes the change in the availability of the three types of health facilities between 1996 and 1999, while **Table 4** records the change in proportion of villages which have health personnel practices in the same time period. The table shows that hospitals are generally located in urban areas. In total, hospital availability was relatively stable. However, there was a decrease in hospital availability in urban Java-Bali. Meanwhile, in the Outer islands areas it slightly increased.

There was generally an increase in the availability of *Puskesmas*, with a higher increase in rural areas, especially in the off-Java-Bali areas. Meanwhile, the presence of pharmacies, which is also generally an urban phenomenon, significantly jumped in urban areas, especially in Java-Bali. There seems a large gap between the increase in the Java-Bali areas and the off-Java-Bali areas. Overall, pharmacies experienced the highest increase compared to the other two health facilities.

Table 3
Proportion of Villages with Health Facilities / Services by Region (%)

	Hospital			Puskesmas			Drug Store/ Pharmacy		
	1996	1999	Δ	1996	1999	Δ	1996	1999	Δ
Total	2.7	2.6	-0.1	34.4	39.1	4.7	7.1	12.1	5.0
Urban	17.3	16.8	-0.6	49.5	52.4	2.9	41.2	54.4	13.2
Rural	0.6	0.6	-0.1	32.2	37.2	5.0	2.2	6.1	3.9
Urban Java-Bali	16.5	15.4	-1.2	50.6	53.6	3.0	41.2	59.3	18.1
Urban off-Java-Bali	19.0	19.5	0.5	47.4	50.0	2.5	41.2	45.0	3.8
Rural Java-Bali	0.6	0.5	-0.1	31.3	35.5	4.2	2.7	10.4	7.7
Rural off-Java-Bali	0.6	0.6	0.0	32.9	38.6	5.7	1.8	2.6	0.8

Notes: - Hospitals include regular hospitals and maternal hospitals.

- Puskesmas is Primary Health Centre.

Source: Counted by authors from various sources

However, Table 4 shows that the availability of doctors tended to increase in all areas, except for the urban off-Java-Bali areas. In the case of paramedics, there was a decline in their availability, which occurred mostly in rural areas. Meanwhile, the urban off-Java-Bali areas were the only areas where there was a tendency of an increase in the availability of paramedics. On the other hand, almost all areas saw an increase in the availability of midwives, particularly in rural areas, with the highest increase occurring in rural off-Java-Bali. Overall, rural areas experienced more than twice the increase in urban areas.

Table 4
Proportion of Villages with Health Personnel by Region (%)

	Doctors			Paramedics			Midwives		
	1996	1999	Δ	1996	1999	Δ	1996	1999	Δ
Total	15.6	16.1	0.5	44.7	43.1	-1.6	67.0	82.0	15.0
Urban	65.3	66.2	0.9	79.0	78.8	-0.2	81.6	88.9	7.3
Rural	8.4	8.9	0.4	39.8	38.0	-1.8	64.9	81.0	16.1
Urban Java-Bali	65.2	66.9	1.7	76.5	76.0	-0.5	82.2	90.1	7.9
Urban off-Java-Bali	65.3	64.9	-0.4	83.7	84.1	0.4	80.6	86.7	6.1
Rural Java-Bali	10.6	11.3	0.7	44.3	42.1	-2.2	76.9	86.1	9.2
Rural off-Java-Bali	6.7	6.9	0.2	36.2	34.6	-1.6	55.3	76.9	21.6

Source: Counted by authors from various sources

Small surveys conducted by the World Bank indicated that drug prices increased by 200 to 300 percent between November 1997 and March 1998.³⁴ The price hike has caused drug shortages, which forced some health centres to close. Pregnant women also turned to traditional midwives (*dukun bayi*) when delivering at home.

In an effort to increase access to quality health care for women in the villages, the government sent over 54,000 midwives to villages throughout Indonesia between 1990 and 1996. The trend seemed to continue to 1999 as shown by the increase in percentage of villages with trained midwives. On the other hand, the fact that paramedics' availability decreased in the rural off-Java-Bali areas and increased in the urban off-Java-Bali areas might indicate that paramedics actually move to urban areas where people are generally wealthier and can afford to pay them better.

³⁴ World Bank (2002b).

As the crisis developed, it was predicted that there would be a shift from private health facilities to the subsidized public sector. Instead, the overall use of both public and private health facilities fell steadily and was replaced by higher rates of self-treatment.³⁵ A decline of about 2 percent was observed in the use of public health by adults between 1997 and 1999, and the use of child healthcare declined by 6 percent over the same period. Both urban and rural areas saw a decrease in the use of health facilities. Greater reliance on self-medication might account for the increase in percentages of villages with drug stores/pharmacies over the 1996-1999 periods as indicated in **Table 4**.

C. Public Utilities

The government used to supply most of the utilities through its state-owned enterprises before privatising and agreeing to jointly operate some of the utilities services to private firms in the 1990s. The demand for energy and telecommunications in Indonesia has been increasing in recent decades due to expansion in economic activities and population growth. The economic crisis slightly decreased final energy consumption in Indonesia from 55,700 ktoe in 1997 to 55,200 ktoe in 1998.³⁶ On the other hand, the crisis also caused a sharp decline in the rate of growth of electricity demand from 13.2 percent in 1996/1997 to 1.4 percent in 1997/1998,³⁷ which implied that people switched from electricity-based source of energy to other sources of energy, such as biomass fuel.

The need for adequate water supply and sanitation has plagued many Indonesian cities even prior the crisis. In Jakarta, only 20 percent of total households have access to clean water.³⁸ Lacking access to clean water, poor (and some non-poor) communities in Jakarta resorted to buying clean water from informal water providers at higher than official rates. According to the World Bank, around 75 to 77 million people in Indonesia lacked access to safe drinking water before the crisis.³⁹

Lack of adequate sanitation, such as waste disposal service, has also plagued many large cities in Indonesia. Untreated waste is usually thrown into the sewers, rivers, or canals, thus exacerbating future floods. The recent economic crisis resulted in the decline of the government's

³⁵ Otto (1999).

³⁶ APERC (2002).

³⁷ Widiono (2000).

³⁸ URDI (2000).

³⁹ World Bank (1997).

capacity to expand, rehabilitate, and maintain public services as well as infrastructure in urban areas. With an inadequate infrastructure and public services to serve the growing urban population, the decline in government's capacity to maintain existing infrastructure further degrades the environment.

According to a report by the International Telecommunication Union, network development slowed down in the post-1997 period.⁴⁰ Fixed telephone subscriber growth in South East Asia, including Indonesia, dropped sharply after 1997, averaging just 8 per cent a year between 1997 and 2000 compared to 19.5 percent between 1991 and 1997. The decline in the value of the *rupiah* also raised the postal charges due to the increase in costs incurred by shipping and other third parties.

Table 5 shows the proportion of villages with access to Gas/LPG/kerosene for cooking fuel, improved water sources, and trash disposal service. **Table 6** provides information regarding the proportion of villages with access to electricity and fixed telephone lines. Lastly, **Table 7** shows the proportion of villages with public communication services, such as public telephones and postal services.

As can be seen from **Table 5**, access to Gas/LPG/kerosene increased in total between 1996 and 1999. Urban areas experienced a higher increase in access than rural areas, while (*Java-Bali*) villages on Java-Bali experienced a slightly higher increase than villages' off-Java-Bali. In contrast, access to improved water sources slightly declined in urban areas and rural Java-Bali. For trash disposal service, in total there was a slight decrease in access to the service with a significant decrease in urban areas. There were no significant differences between changes in Java-Bali and off-Java-Bali areas.

⁴⁰ ITU (2001).

Table 5
*Proportion of Villages with Majority Households
 having Access to Utilities by Region (%)*

	Gas/LPG/kerosene as cooking fuel			Improved water sources for drinking			Trash disposal service		
	1996	1999	Δ	1996	1999	Δ	1996	1999	Δ
Total	16.1	21.9	5.8	72.1	72.0	-0.1	9.6	8.9	-0.6
Urban	75.4	82.4	7.0	96.8	95.7	-1.1	55.0	52.5	-2.5
Rural	7.6	13.3	5.6	68.6	68.6	0.0	3.1	2.7	-0.4
Urban Java-Bali	73.2	80.3	7.1	97.8	96.8	-1.1	50.5	48.1	-2.5
Urban off-Java-Bali	79.6	86.5	6.9	94.9	93.8	-1.1	63.7	60.9	-2.7
Rural Java-Bali	12.7	19.6	6.9	75.2	74.8	-0.4	3.2	2.8	-0.3
Rural off-Java-Bali	3.5	8.1	4.6	63.3	63.7	0.4	3.0	2.6	-0.4

Notes: Improved water sources include piped water, mineral water, and water from pumps or protected wells.

Source: Counted by authors from various sources

Table 6 shows a large increase in the total percentage of households with access to electricity, especially in rural areas. In general, rural areas—led by rural Java-Bali areas—experienced more than double the percentage point increase than urban areas. When compared between islands, the increase in the access to electricity in the villages on Java-Bali is about twice the increase that villages in off-Java-Bali experienced. This fact might be related to the phenomenon that when a household had an opportunity to connect to the electricity network, the vast majority does so regardless of their income level.⁴¹

Table 6
Proportion of Households with Access to Selected Utilities by Region (%)

	Electricity			Fixed telephone lines		
	1996	1999	Δ	1996	1999	Δ
Total	44.6	60.0	15.4	1.6	2.9	1.3
Urban	80.9	88.2	7.3	10.3	16.3	6.0
Rural	39.4	56.0	16.6	0.4	1.0	0.6
Urban Java-Bali	79.3	88.1	8.8	9.1	15.7	6.6
Urban off-Java-Bali	83.9	88.4	4.5	12.7	17.6	4.9
Rural Java-Bali	47.0	69.3	22.3	0.4	1.4	1.0
Rural off-Java-Bali	33.3	45.3	12.0	0.4	0.7	0.3

Notes: Electricity includes state (PLN) and privately provided

Source: Counted by authors from various sources

⁴¹ Komives, Whittington, and Xun (2001).

In general, access to personal fixed phones rose in both urban and rural areas, although much higher in urban areas. Except for a small increase in rural Java-Bali, most rural areas did not see much change in access to fixed phone lines. This implies that the development of private fixed telephone lines in Indonesia is still very much urban biased.

Table 7
Proportion of Villages with Public Communication Services by Region (%)

	Public telephones			Postal service		
	1996	1999	Δ	1996	1999	Δ
Total	13.8	23.0	9.2	26.1	27.5	1.4
Urban	71.9	83.3	11.4	53.1	52.56	-0.5
Rural	5.5	14.3	8.8	22.3	24.0	1.7
Urban Java-Bali	73.1	87.1	14.0	55.1	55.3	0.2
Urban off-Java-Bali	69.5	76.0	6.6	49.2	47.3	-1.9
Rural Java-Bali	9.3	26.6	17.3	28.4	31.5	3.2
Rural off-Java-Bali	2.4	4.4	2.0	17.4	17.8	0.5

Notes: - Public phones include coin and card operated phones, and telephone kiosk.

- Public postal services include post office and mobile postal service.

Source: Counted by authors from various sources

Meanwhile, **Table 7** shows that in contrast to the relatively small increase in access to fixed telephone lines, access to public phones grew much higher, particularly in Java-Bali. Compared to off-Java-Bali, urban areas in Java-Bali experienced more than twice the percentage point increase, while rural Java-Bali experienced almost nine times the percentage point increase in rural off-Java-Bali. Access to the state-owned postal services appears to have slightly expanded in most areas, with rural Java-Bali the highest, except in urban off-Java-Bali, where it declined. This caused the total urban access to decline slightly, while the total change was positive.

D. Transportation

In Indonesia, there are several governmental agencies assigned to administer transportation-related infrastructure: The Department of Transportation of the central government, which designs transportation regulations, maintains road signs and signals, and oversees commercial vehicles; The Department of Housing and Infrastructure of the central

government, which maintains the quality of roads, bridges, and streetlights with the help of the Department of Public Works of the local governments; and the Police Department, which guards safety on the roads and oversees passenger vehicles. Officially there are no private firms involved, except when the agencies subcontract their duties to private contractors in building an infrastructure.

Similar to some public utility services, the construction as well as maintenance of roads in Indonesia was hampered during the crisis. Lack of road maintenance was indicated by the slight decrease in the percentage of asphalt roads in urban areas. **Table 8** shows data on the quality of transportation infrastructures.

The table shows that there was a small net decline in the percentage of villages with asphalt roads, which suggests a deterioration of asphalt roads in some areas. In contrast, however, all areas saw improvements in road accessibility to cars and motorized public transport, although the increases happened mostly in rural areas, while urban areas were relatively unchanged. The mode of public transportation also changed in rural areas as a result of better accessibility with motorized public transportation modes experiencing an overall 3.5 percentage point increase.

Table 8
*Proportion of Villages having Relatively
Good Transport Infrastructure by Region (%)*

	Majority of roads are asphalt sealed roads			Majority of roads are accessible to cars			Main public transport is motorized		
	1996	1999	Δ	1996	1999	Δ	1996	1999	Δ
Total	60.7	59.4	-1.3	91.1	94.5	3.5	91.2	94.3	3.1
Urban	93.5	92.1	-1.4	99.5	99.8	0.2	97.7	98.0	0.3
Rural	55.6	54.4	-1.3	89.8	93.8	4.0	90.2	93.8	3.5
Urban Java-Bali	93.0	92.1	-1.0	99.7	99.9	0.2	97.8	98.1	0.2
Urban off-Java-Bali	94.4	92.3	-2.2	99.1	99.5	0.4	97.5	98.0	0.4
Rural Java-Bali	58.6	55.9	-2.7	95.0	98.1	3.1	93.4	95.5	2.1
Rural off-Java-Bali	53.0	52.9	-0.1	85.0	89.8	4.8	87.7	92.4	4.7

Source: Counted by authors from various sources

E. Business Institutions

Prior to the financial crisis, several formal financial institutions were successful in extending their services to the countryside. The most

notable was the state-owned *Bank Rakyat Indonesia* (BRI), which succeeded through its *unit desa* (village unit) system in providing financial services widely and profitably throughout rural *Indonesia*.⁴² At the other end of the scale were rural banks (*Bank Perkreditan Rakyat*, (BPR)), which is regulated financial institutions set up with minimum capital requirements. BPRs are authorized by the central bank to provide loans and deposit services but not current account and overdraft services.

As part of a reform agreement with the IMF, the Indonesian government closed a number of ailing commercial banks in 1997. Consequently, the availability of public banks, especially in urban areas, declined. **Table 9** shows the proportion of villages that have permanent market buildings and **Table 10** provides information on the villages that have financial institutions.

Table 9
Proportion of Villages having Permanent Market Buildings by Region (%)

	Shopping Complexes			Permanent Markets		
	1996	1999	Δ	1996	1999	Δ
Total	10.6	12.0	1.4	13.2	15.6	2.4
Urban	48.1	50.6	2.6	35.4	37.2	1.8
Rural	5.3	6.5	1.2	10.1	12.5	2.4
Urban Java-Bali	51.4	53.2	1.8	38.1	39.6	1.5
Urban off-Java-Bali	41.6	45.7	4.1	30.1	32.4	2.3
Rural Java-Bali	6.6	8.3	1.7	12.9	15.0	2.1
Rural off-Java-Bali	4.2	5.0	0.8	7.8	10.5	2.7

Source: Counted by authors from various sources

Overall, as shown in **Table 9**, the number of villages with shopping complexes increased, with urban areas experiencing twice the percentage point increase in rural areas. A closer look reveals that most of the increases were in urban off-Java-Bali areas. Urban and rural (*Java-Bali*) areas on Java-Bali experienced a similar percentage point increase, while there was only a slight increase in rural off-Java-Bali. For permanent markets, the increases were more even, except in the urban Java-Bali areas which showed the lowest increase. This reflects the fact that the proportion of villages with permanent markets was already high in the urban Java-Bali areas since before the crisis.

⁴² McGuire and Conroy (1998).

Table 10
Percentage of Villages having Financial Institutions by Region (%)

	Public Banks			Rural Banks (BPR)			Cooperatives		
	1996	1999	Δ	1996	1999	Δ	1996	1999	Δ
Total	8.1	7.8	-0.3	16.2	11.6	-4.5	28.1	39.1	10.9
Urban	38.9	38.3	-0.5	32.2	30.7	-1.6	66.2	76.9	10.7
Rural	3.7	3.4	-0.3	13.9	8.9	-4.9	22.7	33.7	11.0
Urban Java-Bali	41.2	41.5	0.4	45.7	39.6	-6.1	69.1	79.6	10.6
Urban off-Java-Bali	34.3	32.0	-2.3	6.1	13.4	7.2	60.7	71.7	11.0
Rural Java-Bali	5.6	5.2	-0.4	28.0	18.1	-9.9	26.9	39.3	12.4
Rural off-Java-Bali	2.2	2.0	-0.2	2.4	1.5	-0.9	19.3	29.1	9.8

Source: Counted by authors from various sources

As for financial institutions, **Table 10** shows that there was a slight decrease in the availability of public banks due to bank closures. In addition, urban off-Java-Bali areas experienced the highest decline in bank availability, while urban Java-Bali villages were the only ones that experienced an increase. Similarly, there was a decline in total BPR availability, especially in Java-Bali areas, while urban off-Java-Bali areas experienced a 7.2 percent increase in BPR availability. Rural-off-Java-Bali areas only experienced a slight decline.

In January 1998, the Indonesian government guaranteed the deposits of many commercial banks, but did not extend the guarantee to BPRs. This caused a movement of capital from rural to commercial banks, which threatened the viability of many rural banks. This probably explains the decline in the availability of BPRs in some areas.

In contrast, there was an almost 11 percent jump in the availability of cooperatives in Indonesia from 1996 to 1999, with the figure being almost equal for both rural and urban areas. Hence, there was an almost uniform increase in the number of cooperatives in Indonesia. This mushrooming of cooperatives was due to the policy of the then new government to channel funds for farm credits (*Kredit Usaha Tani*, KUT) through cooperatives. This policy was later abandoned due to high default rates.

6. CONCLUSION

Infrastructure plays a crucial role in economic development and poverty reduction. Indonesia's impressive past record on economic growth and poverty reduction was supported, amongst others, by massive

infrastructure development programs. The onset of the Asian economic crisis in 1997-98 severely curtailed the government's capacity to maintain the existing infrastructure, let alone building new ones. Hence, there was a concern that infrastructure conditions in Indonesia were deteriorating, which would badly affect the prospects for future economic development and poverty reduction in the country. The analysis in this study presents an overview of the changes in the availability of village-level infrastructure and public services during the economic crisis in Indonesia. The main findings are as follows.

First, there were mixed trends in the availability of different types of infrastructure and public services. The total availability of some infrastructures and public services – such as public primary and senior secondary schools, private junior and senior secondary schools, hospitals, doctor practices, water supplies, trash disposal services, and public banks – did not change much during the crisis. However, the total availability of other infrastructures – such as private primary schools, paramedic services, asphalt sealed roads, and rural banks – showed negative changes or some signs of deterioration. Yet the total availability of some other infrastructures – such as public junior secondary schools, community health centres, drug stores, midwives practices, gas/LPG/kerosene energy sources, electricity, fixed telephone lines, public telephones, postal services, road accessibility to cars, motorized public transportation, shopping complexes, permanent markets, and cooperatives – appeared to be increasing despite the economic crisis.

Second, the changes in the availability of certain infrastructures or public services differ across urban and rural areas as well as between Java-Bali and the Outer Islands. For example, school availability in rural areas improved relative to urban areas, except for private primary schools. The decline in the availability of public banks seems to have mostly occurred in urban areas, while rural banks (BPR) declined mostly in rural areas. Meanwhile, the deterioration in hospital availability occurred only in Java-Bali. However, the deterioration in the availability of asphalt sealed roads seemed to have taken place everywhere, both in urban and rural areas as well as in Java-Bali and in the Outer islands.

These findings point to mixed trends in the availability of key public infrastructures and public services at the village-level. However, there are two qualifications to the findings of this study, both due to data limitations. First, the study only looks at the availability aspect of the infrastructures and public services in question, while the possibility of deterioration in the quality of those infrastructures and public services

due to the crisis cannot be assessed. Second, some infrastructures and public services which are also essential for economic development and the welfare of the poor, such as irrigation and agricultural extension services, were not included in the analysis because the data were not available.

There were some indications of a decline in the government's capacity to build and maintain some key infrastructures and public services. In the era of regional autonomy, it is essential for the regional governments to be consulted in any discussion and planning of infrastructure development because they have more in-depth knowledge of their own areas. By being involved in the planning, regional governments can play a bigger role in managing and maintaining infrastructure installations in their areas, which would relieve some burdens from the central government.

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