Reorientation of Clean Water Supply Services in Indonesia

Anor Sihombing

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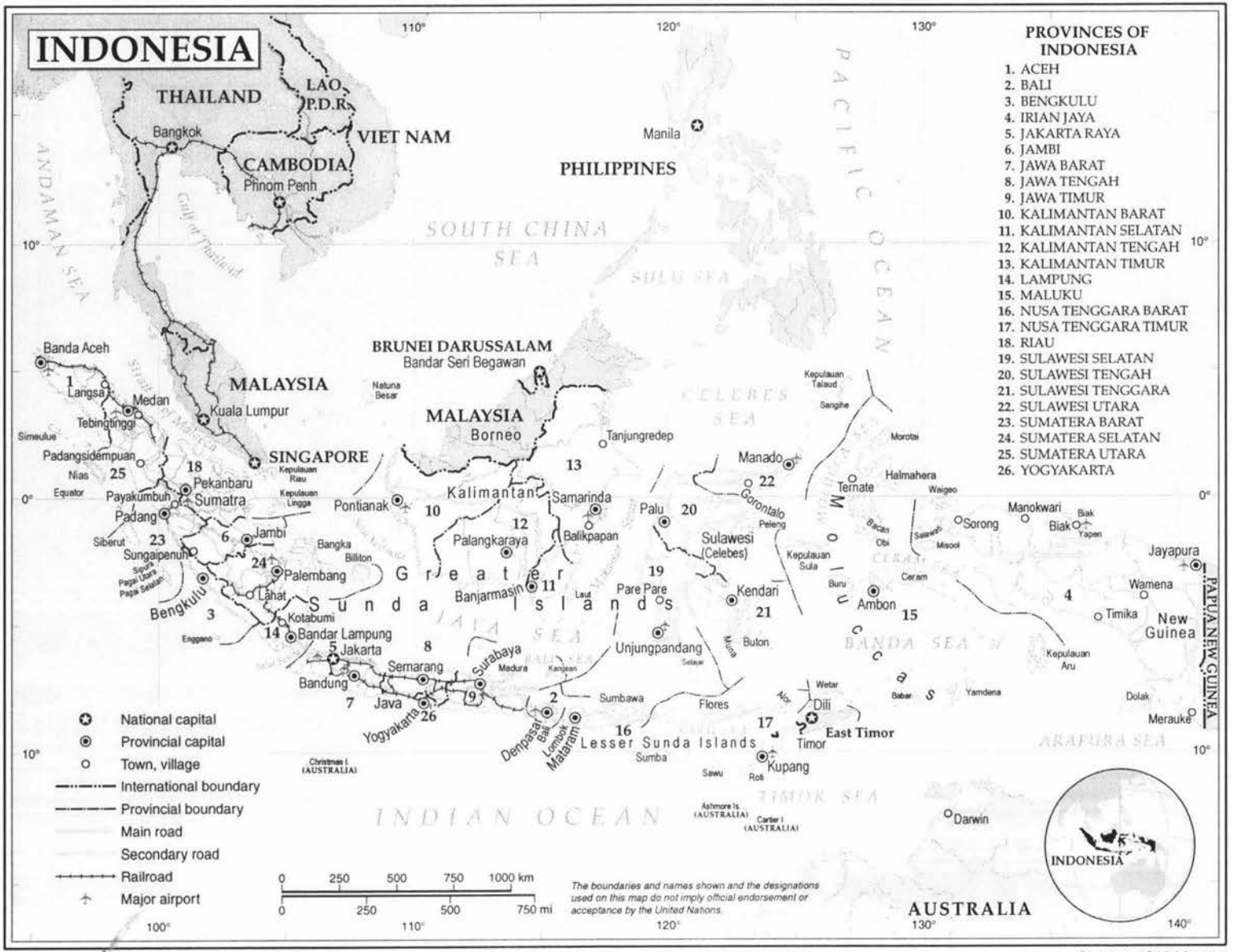

Map No. 4110 UNITED NATIONS
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PREFACE AND ACKNOWLEDGEMENTS

This thesis results from my best efforts during the difficult situation which was happening just before the referendum, and during the systematic terror campaign in order to stop the people of East Timor from gaining their independence. How I have enjoyed my two years of wonderful support from the people of New Zealand who have also given my family a safe haven in times of trouble.

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During data collection, I was given unconditional access by Prof. Benny Chatib of Perpamsi, as well as from Budhi Sutjahjo of Waseco and Rudi William of Infratama. I also discussed the most up to date issues concerning the development of water supply with Dr. Maxdonny Kamil of Bandung Institute of Technology and Sukarma of The World Bank, Jakarta. I collected some information from the United Nations' Information Centre in Jakarta. During my fieldwork in PDAM Kabupaten Bandung, I received great assistance from my colleague, Joedi Herdianto. In proof-reading, I owe Helen Scott, James Elise and Rahlene Thomas who have contributed a great deal, although they were extremely busy.

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ABSTRACT

There have been major problems with the sustainability of water supply development and provision in urban areas of Indonesia, carried out by PDAMs under local government control. Two critical issues that are being faced by PDAMs are: (1) the capacity of PDAMs to increase the current coverage of the provision, which currently is only 40% of urban population and (2) the capability of PDAMs to carry on their developmental mission in providing clean water in urban areas.

The main objective of this thesis is to examine the most influential factors behind the failure of water supply development in urban areas of Indonesia. The research findings in this thesis propose the necessary reformation to be taken in order to give the right orientation to water supply development. Based on a review of the literature, field work, discussions, correspondence and experiences of the author. I argue that the most influential factors concerning sustainable development of urban water supply of Indonesia are related to: population, urbanisation, income, human resources, supervision, private sector participation and central government control.

This thesis has drawn the conclusion that the development of water supply in urban areas of Indonesia in the twenty-first century will depend on the success of the government to provide solutions to the following issues: population growth, urbanisation, household and labour income, human resources and a lack of supervision. The establishment of day-to-day supervision and the introduction of a Water Consumers Organisation (WCO) will provide better control over the PDAMs. Development of human resources conducive to the needs of PDAMs is seen as the firmest foundation towards the sustainable provision of clean water in the urban sector of Indonesia.

GLOSSARY OF TERMS & ABBREVIATIONS

ADB	Asian Development Bank
AIDAB	Australian International Development Assistance Bureau
APBD	Anggaran Pendapatan dan Belanja Daerah (Local Government Budget)
APBN	Anggaran Pendapatan dan Belanja Negara (National Government Budget)
AusAID	Australian Agency for International Development
BAPPEDA	Badan Perencanaan Pembangunan Daerah (Regional Development Planning Board)
BAPPENAS	Badan Perencanaan Pembangunan National (National Development Planning Board)
BPAM	Badan Pengelola Air Minum (Interim water enterprise)
BPS	Biro Pusat Statistik (Statistical Bureau)
CPI	Consumer Price Index
DEPDAGRI	Departemen Dalam Negeri (Ministry of Home Affairs = MoHA)
Depkes	Departemen Kesehatan (Ministry of Health)
ETWSSP	East Timor Water Supply and Sanitation Project
GDP	Gross Domestic Product
GNP	Gross National Product
GOA	Government of Australia
GOI	Government of Indonesia
IPTN	Industry Pesawat Terbang Nurtanio
IUIDP	Integrated Urban Infrastructure Development Program
Kabupaten	District level, a subdivision of province
Komda	Komisi Daerah (Commission Area)
KORWIL	Wilayah Koordinasi (Area of Co-ordination)
Lcd	Litre per capita per day
LDRs	Less Developed Regions
Lps	Litres per second

MDRs	More Developed Regions
MoHA	Ministry of Home Affairs
MOU	Memorandum Of Understanding
MPW	Ministry of Public Works
NGO	Non Government Organisation
O&M	Operation and Maintenance
OECD	Organisation for Economic Co-operation and Development
PDAM	Perusahaan Daerah Air Minum (Local Water Supply Enterprise), PDAMs is adopted to indicate more than one PDAM.
PERPAMSI	Perusahaan Air Minum Seluruh Indonesia (Indonesian Water Supply Association)
PID	Project Implementation Document
PSP	Private Sector Participation
UFW	Unaccounted For Water
UNCHS	United Nations Centre for Human Settlements
UNDP	United Nations Development Programme
UNIC	United Nations Information Centre
Unsfir	United Nations Support for Indonesia Recovery
USAID	United States Agency for International Development
WB	World Bank
WCO	Water Consumers Organisation
WTP	Water Treatment Plant

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

Chapter 1

THE THESIS IN OUTINE

1.1 Introduction

What is currently happening in the development of water supply in the urban areas of Indonesia? Is urban water supply, under the management of local water supply enterprises, the so called 'Perusahaan Daerah Air Minum' (PDAM) in Indonesia, developing the right orientation? What reformations are required by PDAMs in order to meet the challenges of the 21st century?

These are amongst the most urgent questions to be asked. At present only 40 percent of the Indonesian urban population is being served by PDAMs, whereas 40 percent of the water is believed to be unaccounted for. Yet, there is a remarkable lack of certainty about the answers. But the main concern is to understand what has gone wrong, and what actions are required to correct what has happened in the past, and how this information can better inform urban water provision in the future.

This thesis presents a brief overview, and interpretation, of the present situation. This perspective will enable us to draw critical conclusions about what is happening and what recommendations are required in order to bring sustainable solutions to the provision and development of clean water in Indonesia. This research is mainly addressed to the government and PDAMs.

The first chapter of this thesis outlines the following chapters. It sketches the way the research was carried out, the objectives, methodology, limitations of the study and ethical aspects of the research.

Chapter Two sketches the implications of population growth and urbanisation in Third World Countries. It points out that the population growth of Third World countries, or less developed countries, tends to be much higher than that of the more developed countries. It discusses arguments about the relation between population growth, poverty, natural resources exploitation and environmental pressures. This chapter also outlines the capacity of current infrastructure provision. Finally I outline the potential but also the problems of moving water supply toward market based solutions.

Chapter Three discusses, particularly, the issue of population, urbanisation and problems of development in Indonesia. It highlights the rapid growth of population from 119 million in 1971 to 204 million in 2004, which gives an annual increment of approximately over 3 million. This chapter also reveals that the population density of the main cities are at alarming levels. Java island which is only 6.58 percent of the country's land mass, is settled by approximately 58 percent of the Indonesian population. In 1998, population density for Indonesia had reached 938 people/km2. The most populated urban area of Indonesia is in the capital, Jakarta, where the density is approximately 9700 per km^2.

Besides the population growth of each province from 1971 to 1995, this chapter also discusses the size of households in the main islands of Indonesia. The size of individual households has decreased from about 4.36 in 1994 to 4.14 in 1998. Yet, this thesis will adopt a 5 per household figure as the basis for estimating numbers of new connections required in Indonesia.

The second half of Chapter Three focuses on urbanisation, where the majority of people's motivations to move is related to employment reasons. Meanwhile the annual urban population increment has been continuously increasing. In 1980 it was 1.2 million, but by 1995 this figure increased to almost 3 million. Surprisingly, this figure is almost equal to the entire annual population increment of Indonesia. The last part of Chapter Three discusses poverty. It shows that the number of

people living in poverty officially decreased from 1976 to 1996, but this trend no longer continues but has reversed, the main cause being economic turmoil. Public servants and private labourers are some of the most deprived employment groups where basic salaries have not been able to meet basic needs.

Chapter Four explains the organisation of PDAMs and the number of customers they serve. It begins with a brief summary of the PDAMs, including categories, number of connections by categories and coverage. It shows that almost 73 percent of the PDAMs are categorised as small PDAMs (number of connections less than 10,000). The second half of this chapter is concerned with the high level of Unaccounted For Water (UFW) and low levels of coverage. These indicators should be of the utmost concern to PDAMs in Indonesia.

At the end of the chapter, it is argued that the ratio of connections per staff working for PDAMs is considerably low, and it is not surprising that the worst ratios found lie within the provinces located farthest from the centre of development. More resources are placed into developed urban areas, instead of into remote areas. There is a suspicion that limited human resources, low salary of PDAMs staff and the heavy control by central government have caused PDAMs to lose their initiative to develop and serve the peoples most in need.

Chapter Five attempts to examine, in detail, what is precisely happening with PDAMs and will try to propose solutions to these problems. The beginning of the chapter argues how the macro-economy influences the development of water supply in Indonesia. For instance, depreciation of Rupiah (Indonesian currency) against the US currency and inflation, have heavily influenced efforts to develop the provision of clean water. Yet, one of the most credible political economists of Econit views the year 2000 as the 'Rebirth of the Indonesian Economy' (Econit Economic Outlook, 1999 in Kompas 16 Dec. 1999). Hence, from the angle of macro-economics, there is a seed of hope for the rebirth of clean water provision in Indonesia. The second part of the chapter points out that there are some more

influential factors hindering PDAMs efforts, they are: the quality and the capability of human resources, differences in salary, supervision and private sector participation.

Chapter Five also argues that the lack of supervision and the absence of control by the beneficiaries (who are the customers) has lead to frequent mismanagement. The heavy control, and central mandatory, of central government over PDAMs has disadvantaged their efforts. There is a need for government to introduce Private Sector Participation (PSP) on a day-to-day basis in PDAMs management structure. This should not be translated into private sector divestiture, but a gradual handing over of management of PDAMs to the private sector. The establishment of a Water Consumer Organisation is seen as a critical element that has been absent since PDAMs have existed.

Chapter Six summaries the discussions of the previous chapters. It concludes that there are influential factors behind the tardiness of clean water provision to urban areas of Indonesia. The last part of Chapter Six outlines the recommendations needed in order to reform, and bring about, development to the water supply sector. It includes aspects such as population growth, rapid urbanisation, households income, human resources, supervision, private sector participation, environmental concerns, and centralised development approach. Development will only take place if the government, or the PDAMs, attempt to reform their approach and change their attitudes towards water provision. I outline what should be the basis for a sustainable water supply.

It is also noted in this chapter that the conclusions and recommendations drawn from this thesis are only applicable to the cultural settings and political environment in Indonesia. My findings may not have generalising power, therefore, the lessons drawn from this thesis should be applied to other settings with care.

1.2 Research Outline

This research project proposes to investigate the current lack of clean water supply in urban areas of Indonesia. This thesis examines why provision of clean water is so low and how local water supply enterprises may reform their strategies in order to meet increasing need.

The institutional body, working on the development of clean water supply in Indonesia is the Local Clean Water Supply Authority, called PDAM (Perusahaan Daerah Air Minum). The association of PDAMs in Indonesia is called Perpamsi (Indonesian Water Supply Association, IWSA). These are the two institutions which have access to the data for clean water provision in urban areas of Indonesia. Perpamsi collects the essential performance indicators of approximately 300 local water supply enterprises in Indonesia, covering western, middle and eastern parts of Indonesia.

A detailed survey was conducted at PDAM Kabupaten Bandung (co-ordinating 17 subsystems of water supply). This survey sought to obtain a clearer picture of the situation of the PDAM both financially and technically, i.e, how can they could increase the quantity, quality and continuity of their service?

This thesis also relied on literature, reports, correspondence and discussions with related institutions, such as The World Bank and Perpamsi. The author's personal experience in providing consultancy work, enriched the effort of this thesis to reach its conclusions and recommendations.

1. 3 Objectives

The specific objective of this research is 'to determine the factors which can be reformed in order to increase access, by all social classes, to clean water supply in urban areas of Indonesia'.

1. 4 Limits of the Study

This study was performed in Indonesia over a 6-week period, with most of the time spent, by the author, researching data on urban water supply. In collecting the data, the author visited the World Bank in Jakarta, the United Nations Information Centre, Perpamsi, and two consultant offices located in Jakarta. The data collection process was also conducted in PDAM Kabupaten Bandung. The author mainly concentrated on the development, planning and design, public relations and production unit sections of the PDAM.

The data collected, during field work, is the only data provided by the related institutions. However, it is important for the reader to approach the data with care. Reliability and accuracy of data in Indonesia is questionable, as well as the method in obtaining it, procedure of collecting, sorting, compiling and interpretation.

Finally, this thesis limits the study of the water supply to urban areas, where the institutions responsible for providing the service are the PDAMs. There are about 300 PDAMs in Indonesia, and most of the performance data is collected by Perpamsi. Rural water supply is not part of this research, however, a small proportion of the PDAMs service is also allocated to rural areas. This is unavoidable, particularly for PDAMs who rely on water resources located in rural areas. Health aspects and gender issues are not specifically examined in this thesis, but are briefly discussed in the literature study.

1. 5 Ethical Standards

The procedures applied in this research comply with Massey University ethical standards, where obtaining consent from the data provider is obligatory. For example, three months before the fieldwork, the researcher established contact with Perpamsi in Jakarta. Perpamsi officially appointed an engineer, as a contact

person, for this research project. Through Perpamsi, the researcher asked for a reference letter giving permission to visit two local water authorities (PDAM). Both Perpamsi and the directors of PDAM were informed of all aspects of this research project, including an information sheet and a consent form that required their signature. All procedures in this research were accepted by the Massey University Human Ethics Committee and were considered to meet their required standards.

Chapter 2

URBAN GROWTH AND INFRASTRUTURE IN THE THIRD WORLD

2. 1 Introduction

> *Public gas, which was established in 1856 in Buenos Aires, by 1910 was serving most of the federal capital. The telephone just took one decade to achieve a modestly sized network. In 1905, 72.5 percent of the population had access to drinking water. In 1938, the water consumption rate had reached almost 400 litres per capita per day* (Pirez, 1999:209).

The above quotation is taken from Pirez, who studied the history of urban services in Buenos Aires. He found a census, conducted in 1960 which indicated that infrastructural services failed to keep up with city growth rates. The two issues which have significant correlation with the decline of the services are population and economy (Ibid:212). Therefore, public service provision can show increasing trends, or can be in reversal, fluctuating with the rise and fall of the population and the economy. (The World Bank Press Release, No. 96/69S, Pernia and Alabastro, 1997).

This chapter outlines population growth and urbanisation in Third World countries. As Pirez found, population growth in Third World countries tends to be much higher than that of the more developed countries. The debate on population growth is not just related to high levels of population, but it is also linked to poverty, natural resource exploitation and environmental degradation. One of the most notable issues in the growth of urban Third World cities is the

rapid increase of urbanisation. This chapter also outlines the infrastructure and problems occurring in the Third World. One of the trends (which always invites debate), is the declining role and control of government over public services, and the restructuring of services in order to give greater participation to the private sector.

2. 2 Urbanization and Migration in the Third World

Economic activities, such as investment, which are taking place in the majority of Third World countries are aimed at improving the welfare of their people. On the other hand such investment also attracts people to urban centres (Forbes, 1996). It seems regardless of where economic activity is located, people will be attracted to it. One of the greatest impacts of these economic activities is rapid urbanisation growth. People move in search of jobs, expecting more income, and usually from industry and urban services.

In general, these urbanisation motives are distinguished by two main factors. The 'Pull' factor argues that urban areas become more attractive and are financially more promising to people to move into (Johnson, 1980; Forbes, 1996). The 'Push' factor is linked to the poor living conditions and economic pressures in rural areas which drives people to leave.

Other theorists group migration into two types: behavioural and structural. Behavioural theories emphasise the decision-making of the individual migrant, in contrast, structural theories give less weight to individual decision-making, emphasing the conditions which determine options open to potential and actual migrants (Ibid:16). Forbes (1996) added that neither the behavioural nor the structural theories provided a complete explanation, therefore both perspectives need to be combined in order to highlight the main factors of why urbanisation takes place. More specifically, research in rural Peru (Parnwell, 1993) found different categories of motivations behind the process of urbanisation, such as:

- To earn more money.
- To join kin already working
- No work in the villages
- Work opportunities presented themselves
- Dislike of village life
- To be near the village and family
- To support nuclear and/or extended family
- Poor (low income)
- To pay for education

Of the above motives, Parnwell found that, 'economic motivations underpin the great majority of migratory movements in the Third World' (Parnwel, 1993: 84). Forbes (1996:16) uses another factor in the form of 'income maximisation'; individuals move from one place to another if their income is likely to improve.

Income per Capita Ratio between Urban and Rural Workers

A study of rural-urban migration in nine selected Third World countries (Table 2-1), shows that the urban/rural income ratio ranged from 1.67 to 9.38 : 1 (Lipton, 1977). On average, the income ratio between working in urban areas and rural areas is over 2 fold.

Table 2-1 : Urban / Rural and Non-Agricultural/agricultural Ratios in Per Capita Incomes, Selected Countries (1960s and 1970s)

Urban/rural per capita income ratios		Non-agricultural / agricultural earnings	
Bangladesh	2.70 : 1	Ghana	2.28 : 1
Sri Lanka	2.07 : 1	Sri Lanka	2.70 : 1
India	1.67 : 1	India	2.89 : 1
Philippines	1.92 : 1	Malawi	4.02 : 1
Thailand	2.05 : 1	Tanzania	2.23 : 1
Zambia	9.38 : 1	Zambia	2.93 : 1
Uganda	3.24 : 1	Kenya	2.63 : 1 (men)
Brazil	2.73 : 1		3.73 : 1 (women)

Source: Lipton (1977).

Thus, migration may be seen as an economic decision, i.e an 'investment decision'. Other non-economic decision factors are also important, for example,

the so-called attraction of city 'Bright Lights' as compared to 'Kerosene Light' in rural areas (Johnson, 1980). This comparison is widely used to explain the incidence of rural-urban migration in the Third World countries (Parnwell,1993:89).

As a consequence, the economy has the greatest influence on the concentration of population, therefore the best tool to slow down rapid urban growth is balanced regional development. This is the best incentive for people to stay, particularly in rural areas. The experience of Vietnam is one example which shows that balanced regional development is the most effective way to regulate population mobility (Forbes, 1996: 41).

2. 3 Urban Growth (Third World)

Ehrlich (1971) focuses on population growth related to Third World countries. He found different characteristics of population growth in two different groups of regions; 'More Developed Regions' (MDRs) and 'Less Developed Regions' (LDRs). The United Nations highlights that the average growth rate of urban population in the MDRs, shows that they have a lower level of urban population growth over the period 1950 - 2020 as compared to those in the LDRs.

A remarkable decline in urban population growth of MDRs (from 2.04 to 1.33) was recorded from 1970-1980. In the same period, the LDRs showed a decrease from 3.93 to 3.71 (refer to Table 2-2). In reference to the 1970 figures released by the population reference bureau, doubling times in the LDRs range from 20 - 35 years (Erlich,1971). The MDRs tend to be more successful in maintaining a longer time span ranging from 50 to 200 years, (USA 70 years; Austria 175; Denmark 88; United Kingdom 140; and Japan 63). However, the world population growth in total tends to slow down, and expected to reach 2.21 percent from 2010 to 2020.

Table 2-2: Average Growth Rate of Urban Population (% / year)

Period	MDRs	LDRs	World total
1950 – 1960	2.46	4.88	3.46
1960 – 1970	2.04	3.93	2.92
1970 – 1980	1.33	3.71	2.56
1980 - 1990	0.94	3.6	2.48
1990 - 2000	0.76	3.6	2.58
2000 - 2010	0.61	3.32	2.51
2010 – 2020	0.45	2.79	2.21

Source: Devas and Rakodi (1993):3, Table 1.1

Based on their data, the UN projects that urban population growth for MDRs will decline to 0.45 between 2010 to 2020. Unfortunately, the LDRs will still keep growing, (at 2.79% p.a), resulting in an annual growth of 2.21 for the world total. Among the LDRs, the UN also noted 23 countries with the fastest growth in urban population during 1980-1985 (Table 2-3).

Table 2-3: Fastest Urban Population Growth (in %)

Countries	Urban Growth	Countries	Urban Growth	Countries	Urban Growth
Tanzania	11.6	Mauritania	7.7	Zambia	6.9
Mozambique	10.4	Malawi	7.6	Gabon	6.7
Swaziland	9.0	Chad	7.5	Cameroon	6.7
Burundi	8.8	Benin	7.4	Cote d' Ivoire	6.6
Yemen	8.2	Nepal	7.2	Togo	6.2
Botswana	8.2	Lesotho	7.0	Nigeria	6.1
Kenya	8.0	Libya	7.0	Saudi Arabia	6
Rwanda	7.7	Niger	6.9		

Source: Devas and Rakodi, 1993:4, Table 1.2

'Doubling Time' is a measurement of what these figures mean in real numbers. Doubling time population is the time (in years) required to achieve double the amount of the current population. For example, an area that has an urban population of 10,000, growing at a rate of 1.5 percent, will have a doubling time of 46 years and a tripling time of 74 years (Table 2-4).

Table 2-4: Theoretical Doubling & Tripling Time Population

Population Growth Rate (%)	Doubling Time Population (years)	Tripling Time Population (years)
1.5	46	74
2	35	55
3	23	37
4	17	28
5	14	23
7	10	16

Note: The formula used is geometric : $Pt=Po(1 + r)^n$

Doubling time population for a growth rate of 7% is only 10 years. The MDRs, will likely reduce their doubling time population from 28 years, in 1950-1960, to 154 years in a projected period from 2010-2020. In the same period, LDRs decrease from 14 years to 25 years. Statistically, the average doubling time for the total world urban population increased from 20 years, in 1950 to 1960, to 31 years from 2010 to 2020.

With regard to urban places, the most rapid doubling time of urban population recorded by the UN in 23 selected countries during the period 1970-1985 was Dhaka. Resulting from the establishment of jute and manufacturing and commercials, this city population growth rate was 8.06 percent (Brunn and Williams, 1993). This has led to problems of overpopulation and a lack of maintenance, urban poverty, congestion and unsanitary conditions. These problems are also pointed-out by Brunn (1993:34), he found that urban areas in Third World countries are excessive size in population and in geographical area, overcrowding, shortage of urban services, slums and squatter settlements, traffic congestion, lack of social responsibility, unemployment and environmental degradation. However, both LDRs and MDRs share many of these problems.

The United Nations found that urban population growth in 21 of the 25 largest cities in the developing world during two periods, 1970-85 and 1985-2000 records that most of the cities showed signs of a decreasing population growth rate (refer to Table 2-5). This level is still far above the growth rate in the MDRs. As a result, Forbes (1996) believes that, if Third World countries are able to level-

off their growth to a sustainable level, such as in Singapore, problems associated with rapid urban growth can be eliminated. With the population continuing to grow rapidly, infrastructure and services will fall further and further behind. While an active role would be to slow the rate of urbanisation by diverting development orientation to secondary or smaller towns, it is clear that major urban centres will continue to grow for some time.

Table 2-5 : Populations of the Largest Cities in the Developing World 1970, 1985 and 2000

1985 Size Order		Population (millions)			Growth Rate (%/year)	
		1970	1985	2,000	1970-85	1985-2000
1	Mexico City	8.70	16.70	24.40	4.44	2.56
2	Sao Paulo	8.10	15.50	23.60	4.42	2.84
3	Shanghai	11.40	12.10	14.70	0.40	1.31
4	Buones Aires	8.30	10.80	13.10	1.77	1.30
5	Calcutta	6.90	10.30	15.90	2.71	2.94
6	Rio de Janeiro	7.00	10.10	13.00	2.47	1.70
7	Seoul	5.30	10.10	13.00	4.39	1.70
8	Greater Bombay	5.80	9.50	15.40	3.34	3.27
9	Beijing	8.30	9.30	11.50	0.76	1.43
10	Tianjing	6.90	8.00	10.00	0.99	1.50
11	Cairo	5.30	7.90	11.80	2.70	2.71
12	Jakarta	4.30	7.80	13.20	4.05	3.57
13	Tehran	3.30	7.20	13.70	5.34	4.38
14	Metro Manila	3.50	7.10	11.50	4.83	3.27
15	Delhi	3.50	7.00	12.80	4.73	4.11
16	Karachi	3.10	6.20	11.60	4.73	4.26
17	Bangkok	3.10	5.90	10.30	4.38	3.78
18	Lagos	2.00	5.80	12.50	7.36	5.25
19	Lima/Callao	2.80	5.40	8.80	4.48	3.31
20	Hong Kong	3.40	5.20	6.10	2.87	1.07
21	Madras	3.00	4.90	7.90	3.32	3.24
22	Dhaka	1.50	4.80	11.30	8.06	5.87
23	Bogota	2.40	4.70	6.90	4.58	2.59
24	Baghdad	2.10	4.40	7.70	5.05	3.80
25	Santiago	2.80	4.20	5.60	2.74	1.94

Source: Devas and Rakodi, 1998, Table 1.5

2. 4 Urban Poverty and Infrastructure (Third World)

In contrast to the anxiety of Erlich and other writers, categorically on overpopulation in urban areas, Satterthwaite (1996:6) puts more emphasis on the

issue of urban poverty and sustainability of cities. He argues that, it is not so much the size of a country's urban population, but the production structure and the consumption level within the urban areas and the quality of environmental management that effect the extent to which sustainable development goals are met in cities. However the change of life-style from rural to urban implies that urbanisation should be seen not just on the implication of economic function, but also on social, psychological and behavioral factors. Sustainability entails social stability, poverty leads to conflict which undermines social stability, and hence is unsustainable (Granahan et al in Sattertwaite 1996:107).

Cases like slum areas in cities, open defecation practices, and contaminated rivers, to some extent are associated with urban poverty. In poor settlements, where services are non-existant, environmental quality is poor. Flies are everywhere to contaminate food, mosquitos breed in blocked drains, the use of mosquito coils, and pesticides to combat mosquitoes, means that smoky fuels expose women and children to hazardous pollutants. These are all threats to health. This low income community, marginalised from economic opportunity, needs infrastructure and services. In the context of urban poverty, these writers highlight the necessity of providing adequate and affordable infrastructure and services to the urban poor as a way of preventing further urban environmental degradation.

On the other hand, Potter et al (1999:240) emphasises the creation of jobs to eliminate poverty. They argue that poverty is due to limited job access. Deregulation introduced to give more opportunity to informal sector has not brought the result hoped for. In some Less Developed countries, the UNHCS (1999), World Bank (1994) and Drakakis-Smith (1996) have alleged that absolute poverty was found more in urban areas when compared to rural areas.

The implications of rapid urban population growth then encompasses broad needs, not just basic needs, such as food, health and education, but also a need

for expanding infrastructure and services. The components of urban public infrastructure include water supply, sewerage networks, surface water drainage, highways, roads, and associated facilities (such as bridges and tunnels) and public transport utilities. Infrastructure is an essential component of the city. It plays a vital role in urban areas and gets the city working efficiently, for example, reducing time to collect safe water has given people an opportunity to allocate their extra time for more productive work.

Table 2-6 : Urban Service Indicators 1980

Countries	Water supply (1980) % of urban pop'n served			Sanitation (1980) % of urban pop'n served			Electricity %of urban dwellings with electric lights
	House conn.'n	Public tap	Total	Sewer conn'n	Other system	Total	
Afghanistan	7	21	28	-	-	-	-
Bangladesh	-	-	26	-	-	21	-
Burma	-	-	38	-	-	38	-
Hong Kong	-	-		80	20	100	-
India	-	-	77	-	-	27	-
Indonesia	-	-	35	-	-	29	-
Jordan	78	22	100	18	76	94	-
South Korea	86	0	86	9	91	100	92
Macau	-	-		80	20	100	-
Malaysia	90	-	90	15	85	100	85
Nepal	-	-	83	-	-	16	-
Pakistan	30	42	72	-	-	42	54
Philippines	53	12	65	1	80	81	63
Saudi Arabia	35	57	92	20	61	81	-
Singapore	100	0	100	80	-	80	-
Sri lanka	-	-	65	-	-	80	35
Syria	98	0	98	74	0	74	85
Thailand	-	-	65	-	-	64	86
Turkey	69	26	95	-	-	-	-
Yemen Arab Rep.	-	-	-	10	50	60	-
Yemen (Democ.)	80	5	85	50	20	70	-

Blank spaces mean no data available
[a] Data for electricity are for various years between 1970 and 1980
Source: Devas and Rakodi, 1993, Table 1.6: Urban service indicators 1980,

An efficient transportation network enables farmers to bring their crops to market, as well as workers to commute to work in the city. Households and village-level survey, in Bangladesh and India, found that most developed villages, in terms of access to transportation networks, were significantly better-off than those 'less

developed' in terms of access to agricultural production, incomes, labour demand and health (World Bank, 1994:14). An optimum allocation of communication systems also stimulates efficient trade mechanisms.

The United Nations Centre for Human Settlement (UNCHS) estimates 30 % of the developing worlds urban population does not have access to safe water supplies, where the figure for Africa is around 40 percent. The level of sanitation services in 20 countries in Africa was 57% in 1980 as compared to 59% in Central America, 72% in 11 countries in Latin America and 66% in a selection of 19 other countries. The lowest levels of sanitation facilities, in the above mentioned regions in 1980, was Mauritius 5%, Dominican Republic 25%, Brazil 37% and Nepal 16% (Table 2-6). UNCHS found that 26 out of 58 developing countries in 1980 had not been able to maintain the same level of clean water service to the urban population that had been maintained in 1970.

Why is the level of infrastructural services so low? Economists claim it is because infrastructure is expensive. Governments, particularly in Third World countries (refer to Table 2-7) have limited capacity to increase the services. On the other hand, the income of people is considerably low (Pernia and Alabastro, 1997).

Table 2-7: Expansion of Infrastructure Coverage in Low-, Middle-, and High-Income Economies, recent decades.

Period	Low-income economies 1975 / 1990	Middle-income economies 1975 / 1990	High-income economies 1990
Power-generating capacity (1000kw/millions persons)	41 / 53	175 / 373	2,100
Telecommunications (main lines per 1000 persons)	3 / 6	33 / 81	442
Sanitation (% of population With access)	23 / 42	44 / 68	95+
Paved roads (km per million persons)	308 / 396	1,150 / 1,335	10,106
Water (% of population with access)	40 / 62	54 / 74	100

Source: World Bank ,1994:26, Table 1.3

Prakash suggests a per-capita cost for additional basic infrastructure is US$ 350 - 500 at 1977 prices, and updating the figures to 1992 prices would give a range of US$ 1,400 - 2,000 per-capita (Devas and Rakodi, 1993:9). He then finds that these figures represent 2.5–4.0 percent of the gross national product of developing countries. Assuming this per capita investment for basic infrastructure has generalising power, an additional one million habitants will require investment costs approximately in the range of US$ 1.4 billion – US$ 2.0 billion.

Besides the low coverage in the low income economies, the performance tends to be poor as well. The World Bank estimates, on average, the quality of service is nearly three times worse than in OECD economies; GNP per capita in OECD economies in 1991 was US$ 20,535, as compared to low income economies (US$ 293). The performance does not always conform to the efficiency and the effectiveness of infrastructure provision. The World Bank (World Bank,1994:26) has stated that:

> *Plots of coverage against infrastructure performance shows little relationship across a wide sample of low and middle income countries. World Bank suggests that the efficiency and effectiveness of infrastructure provision is not derived from economic growth and development, but from the institutional environment which often varies across sectors in individual countries*

The World Bank (1994:112) suggests three areas of reform:

- Rationalise the requirement of the country's managerial and technical capacities (quantity and quality) to meet the consumer demands.
- To attract Private Sector Participation (PSP) by providing a better environment for investment (i.e. government commitment, integrity, macro-economic stability and sectoral policy climate, regulation, judicial and financial systems).

- The private sector needs to improve their capacity to assemble resources needed to supply services in the design, construction, financing and operation of infrastructure.

The factors stated above have been found to be typically low in low-income economies. Middle income economies integrate the three dimensions better than low income economies. For example, from high economic growth (7%) and rapid urban population growth (4%), they also have to meet the rapid growing demand of the expanding infrastructure. The main concern of the low-income economies, during 1975-1990 was the provision of sanitation and telecommunication facilities, whereas the middle income economy shifted to the development of telecommunications and power generation. The World Bank believes that 'changes in the institutional environment can lead to improved performance, even when incomes are low'. Infrastructure performances depend on operational efficiency, adequate maintenance, dependence on fiscal resources, responsiveness to users needs, distribution of benefits to all social classes and sufficient environmental responsibility (IBRD, 1994:26).

2. 5 Infrastructure: Toward Market Based Solutions

Macroeconomics in the 1960s had been much influenced by Keynesian vision that argues: government expenditure was a necessary lubricant to ensure that the economy operated at full employment. He further added, that for the sake of investment stability, that the 'commanding heights of industry' were best operated within the public sector (King and Haddock, 1996:9).

Under Keynesian vision, direct state investment in infrastructure and other relief programmes is not just to maintain high employment, but also promotes more employment opportunities through direct state intervention, thus increasing income redistribution. On the other hand, it expanded the role of state control.

Since the economic pressure of the 1980s has eroded the ability of government to expand services (Herijanto, 1998), the pendulum has swung to almost the opposite extreme, which is a market based solution. One way to do this is by promoting 'privatisation'. Privatisation, according to the Oxford Paperback Dictionary (1994, 4th ed.) is defined as 'to transfer (a business) from state to private ownership'. The United Nations translates it into 'to make private' (United Nations, 1999:1). In the UK, some people interpret this very much like denationalisation, or 'the transfer of ownership from the state to private enterprise of as many public sector businesses as possible' (Hasting & Levie, 1983).

In practice, it covers the placement of sharing of ownership, (partly or entirely), through capital, operational and managerial, with the private sector. Placement of shares means to transfer part, or entire, responsibility to the private sector (United Nations, 1992). The main motives for privatisation are given as (Ibid, 1983; UNDP 1991, Herijanto,1998; United Nations, 1999):

- 'The improved and more efficient use of public sector resources by 'opening up new areas to market forces, wherever this can be done' and by 'returning industries and activities to the private sector'.
- 'Wider share ownership' through sales of shares to individual investors or private companies.
- A reduction of 'the burden of the exchequer' and the future need to reduce Public Sector Borrowing Requirement (PSBR).

Anti-privatisation proponents in the United Kingdom and elsewhere believe that an efficient running of nationalised concerns is perfectly possible within the public sector where the requirements of employers and users are more likely to receive attention (Martin,1993). Moreover, the social benefits of providing services are more important than economic efficiency. 'Wider share ownership' is misleading, because control of the company is more important. The private sector will buy only profitable assets. It breaks up a network of services where cross subsidy

previously existed. The liberalisation of the public sector leads to 'cream skimming' (Ibid, 1983), where services are only 'profit oriented'. Privatisation is heavily profit oriented, therefore it does not adopt the principles of income redistribution and cross subsidy, and it has left many without work (Pirez, 1999; Martin,1993)

Efficiency and value for money are the two main philosophies adopted by a market economy which will reduce employment opportunities and pose a threat to employees. Employees fear for their job security because the private sector will exercise the 'hire and fire' approach. Restructurisation programmes in Garuda; the biggest airline in Indonesia, IPTN; the aircraft industry and the banking sector, are all good examples of where, for the sake of 'efficiency', employment 'had to be' sacrificed.

Privatisation may also lead to a deterioration of service, be more expensive, produce higher unemployment and lower wages, and in the end, the quality of life of providers and consumers, will suffer. These are all against the concepts of a welfare state and an equal world. However, despite evidence indicating the way public sectors allow for a more equal distribution of earnings, the World Bank reports positive outcomes impacting from the deregulation and reformation programmes in several cases. The World Bank reviewed the result of privatisation of public services in four countries (Martin, 1993:142) and concluded that:

> *Privatisation improved domestic welfare in eleven of twelve analysed by World Bank in Chile, Malaysia, Mexico, and the United Kingdom. Productivity went up in nine of twelve and showed no decline in the other three. Expanded investment and diversification of production resulted in rapid growth in many of the forms studied. Labour as a whole was not worse off, even taking into account all layoffs and forced retirements. Consumers were better off or were unaffected by the sale in a majority of*

cases. Buyers of the firms made money, but in the main the other stakeholders-labour, consumers and government gained as well.

Infrastructure deregulation on airlines, trucking, railroads, telecommunication and gas sectors in the United States reported gains in profits after adopting new marketing, technological and organisational practices (World Bank, 1994).

Sectoral Agendas for Reform

World Bank studies (Table 2-8) found that there are some sectors that are more attractive to PSP, represented by the so-called Marketability Index. The two most attractive sectors, inviting PSP, are telecommunication and power. The most unattractive sectors are roads and sectors relating to sanitation. The marketability index for rural roads is 1, and for primary and secondary sanitation networks, 1.4. Urban water networks is rated at 2.0, where non-pipe systems are much more attractive, 2.4. These indexes reveal what changes are needed for sectors to attract more PSP. For example, Herijanto (1998), who studied PSP contracts on the water supply sector in Indonesia, found that risk management was insufficiently addressed by both government and the private sector. This would be counter productive to the Marketability Index of this sector.

In the water sector, there are two possible ways to introduce PSP: (1) vertical separation and (2) horizontal separation. Vertical separation divides the enterprises into units, such as raw water treatment, distribution and connection. In the context of water supply, this is a complex matter and may lead to poor results (King & Maddock, 1996). Geroski et al (as cited in King and Maddock, 1996:129), for example, note that vertical separation may lead to the loss of economies of scope, a tendency for lower quality of service due to 'free rider' effects and a loss of socially desirable price discrimination. Overall, restructuring, by way of vertical separation in water supply sectors, may lead to a more

expensive and low quality product. Vertical separation in water supply sectors does not necessarily promote competition.

Table 2-8: Marketability Index of Infrastructure

Key to marketability rating: Low & many = 1 Club=2 , Italic font = 2 Underline = 3		Potential for competition	Characte ristics of goods or services	Potential for recovery from user charges	Public service obligations (equity concerns)	Environ mental externa lities	Marke tability index [b]
Tele-com	Local service	*Medium*	Private	High	*Medium*	Low	2.6
	Long distance & value added	High	Private	High	Few	Low	3.0
Power /Gas	Thermal generation	High	Private	High	Few	High	2.6
	Transmission	Low	*Club*	High	Few	Low	2.4
	Distribution	*Medium*	Private	High	Many	Low	2.4
	Gas Production, transmission	High	Private	High	Few	Low	3.0
Transport	Railbed and stations	Low	*Club*	High	*Medium*	Med.	2.0
	Rail freight and passenger services	High	Private	High	*Medium*	Med.	2.6
	Urban bus	High	Private	High	Many	Med.	2.4
	Urban rail	High	Private	*Medium*	*Medium*	Med.	2.4
	Rural roads	Low	Public	Low	Many	High	1.0
	1st & 2nd-ry road	*Medium*	*Club*	*Medium*	Few	Low	2.4
	Urban roads	Low	*CP*	*Medium*	Few	High	1.8
	Port + airport facilit's	Low	*Club*	High	Few	High	2.0
	Port and airport service [c]	High	Private	High	Few	High	2.6
Water	Urban piped network	*Medium*	Private	High	Many	High	2.0
	Non-piped system	High	Private	High	*Medium*	High	2.4
	Pipe sewerage and treatment	Low	Club	*Medium*	Few	High	1.8
	Condominial sewer	*Medium*	Club	High	*Medium*	High	2.0
	On-site disposal	High	Private	High	*Medium*	High	2.4
	Collection	High	Private	*Medium*	Few	Low	2.8
	Sanitary disposal	*Medium*	*CP*	*Medium*	Few	High	2.0
	1st & 2nd-ry networks	Low	*Club*	Low	*Medium*	High	1.4
	Tertiary (on-farm)	*Medium*	Private	High	*Medium*	*Med.*	2.4

a. Due to either absence of scale economies or sunk costs, or existence of service substitutes.

b. Marketability index is average of ratings across each row.

c. Including cargo handling, shipping and airlines. d. CP=Common Property

Source: The World Bank, 1994:115, Table 6.3.

Horizontal separation divides the management of enterprises based on geography. For example, company A will have the concession of the entire management of the water provision in a certain province. In West Africa, the idea of handing-over the leasing of the water system to only one company gives no horizontal competition (geographically). Sodeci has been given preference to run

a private monopoly on water supply sector. Philosophy 'the need of competition' is not available if the management of entire countries is under sole control (refer to Box 2.1).

Box 2.1:

Water Supply Towards A Market Based Solution: West African's Experience

There are some countries who have shifted their water supply management towards a market based orientation, notably in West Africa, and as a result have gained significant revenue.

Concession for the provision of a safe water supply in Cote d' Ivoire was given to a private company 30 years ago, and has been successful in increasing the quality and coverage of the supply to more than 70 % of the 4.5 million population. The Cote d' Ivoire government decided to extend the concessions to the entire country because of its financial troubles, caused by government policies in 1980, regarding sectoral investment and tariffs. In 1994 there were 300 water supply systems under the management of Cote d' Ivoire's Sodeci, and these operated in a more commercial way. The number of connections growing annually is between 5 and 6 %. During the past 10 years UFW has never exceeded 15% of the billing, efficiency from private consumers (98%) and the ratio of staff to connections was 1:250. Sodeci was also able to pay dividends after retaining operation, maintenance and depreciation costs necessary to maintain the sustainability of the services, and also repayment of rental fees, which serviced the debt during the earlier project financed by the government, as well as taxes. Under government policy, the access of the poor has been fully addressed in the scheme (World Bank 1994, Box. 3.5).

In 1989, four years after the restructuring of Guinea's water supply from government control to SONEG, water tariffs were increased from $0.12 to 0.75 (approx. 500%). The World Bank reported that the high tariff, and the collection ratio of private consumers, had dramatically increased from less than 20% to more than 75% by 1993. SONEG has successfully improved technical efficiency and service coverage (World Bank. 1994: Box. 3.4).

Sanjaya Lall (Martin,1993) pointed out that markets are never as efficient as theories. Developing countries, that do not develop education, set up institutions, promote indigenous technological activities and restrict foreign entry, such as Taiwan and Japan, might failure. Therefore the policies promoting privatisation should be conducted carefully, where social aspects must be taken into consideration. Levie (Ibid:197) suggests that there is a need to develop 'socialist' accounting as a method to demonstrate the costs and benefits of privatisation, not just a 'capitalist account'. Efficiency and profitability should not be measured in only money saved, service cuts and jobs lost, but in a range of social factors:

- The opportunity cost of services to the poor and the rich.
- The social cost of extra unemployment.
- The cost of minimal investment by private contractors who concentrate on immediate returns, and the hire and fire approach.
- The additional cost of living in rural areas which will be exacerbated by supposedly economic costing of services.

Nevertheless, successful countries, reported by notably the World Bank, who demonstrated a greater dependence upon market mechanisms, have inspired others to review their policies. One popular way is to shift public services towards market based solutions. King and Maddock categorise three basic models of infrastructure operations that have been implemented in Western countries, which are also used in Third World countries (King and Haddock, 1996:9)

- Australian model; enterprise operations remain within the public sector and under the same degree of political control.
- United States model: allow private companies to operate the enterprise and then to impose a regulatory structure to prevent abuse of monopoly privilege, i.e. it can be public and private.
- French Model: a system where firms compete for the right to operate monopoly franchises.

2. 6 Clean Water Supply (Third World)

Every year, WHO estimates that more than 5 million people die from illnesses linked to unsafe drinking water and poor sanitation. Diarrhoea remains among the prominent causes of premature death and illness in many urban areas (Saterthwaite,1999:151). Others, such as malaria, dengue fever, trachoma and skin diseases are the common type of water borne diseases. Despite the issue of water and sanitation being addressed in the first conference of human settlement (Habitat I), the number of people without safe water has increased (Ibid).

Table 2-9: Percentage of Urban Population with Access to Safe Water

Country	1980	1990	Early 1980s	1985-87	1990-95
Korea Rep. Of	86	100	86	90	100
Indonesia	35	35	40	43	79
Malaysia	90	96	97	96	96
Philippines	65	93	53	49	93
Singapore	100	100	100	100	100
Thailand	65	67	50	56	98
Bangladesh	26	39	29	24	99
Bhutan	50	60	40	-	-
India	77	86	80	76	85
Nepal	83	66	71	70	90
Pakistan	72	82	78	83	96
Srilanka	65	80	76	82	87
China,People's Rep.of	-	87	-	85	97
Lao PDR	21	47	28	28	57
Mongolia	-	100	-	-	100
Myanmar	38	79	-	36	36
Vietnam	-	47	-	53	70
Source	WRI 95	WRI 95	WRI	UNDP 90	UN 1996

Note: The coverage of water supply may be defined as the percentage of people or beneficiaries in the defined area. This definition varies from one place to another. Some may define it as people in the coverable area, where others define it as people in the serviceable area. The above figures should be viewed with caution.
Source: Pernia and Alabastro (1997), table 4, ADB

WHO also found that international agencies provide less development assistance allocated for water and sanitation since the end of the International Drinking

Water Supply and Sanitation Decade (1981-1990). Pernia and Alabastro (1997:14) who conducted urban water study for ADB found that a one percent increase in urban population growth is associated with a more than 2.5 percent fall in the rate of access to safe water.

More than 300 million urban dwellers lack water, and most of those affected are from low income communities. However, there are few countries that consistently provide adequate water to their urban population. Among those are the Republic of Korea and Singapore who achieved 100% by 1990 (refer to Table 2-9). In general, most countries listed in the table tend to show an increasing coverage. However, countries such as Nepal indicated a reversed trend from 71% in the early 1980s to 66% in 1990. Malaysia, which in general has achieved modest figures in the early 1980s (97%), has slightly decreased to 96% in 1990.

In Asia, several countries, categorised into Less Developed Regions between 1985-1990, had allocated a reasonable proportion of investment to expand the provision of water and wastewater management. Bangladesh, People's Republic of China, and the Philippines allocated 20% of the total infrastructure budget to water and wastewater management, Vietnam, 30 percent and Pakistan boosted its water investment to 55%. Perhaps this is the reason why Pakistan has provided access to clean water to 82% of its urban population by 1990.

WHO also argues that rapid increase in urban population is one of the most notable reasons behind the tardiness of clean water provision. As the urban population of Third World countries continue to grow, the ability of government to expand basic service deteriorates. This means that there will always be a lower capacity in mobilising resources to make provisions of water on an adequate basis. World Bank studies, the ADB (Pernia and Alabastro,1997) and WHO (1999) indicate that middle income and high income classes will benefit, although cross subsidies have been designed to give the same opportunities to low income societies (ADB, 1997). Middle income areas are often within the system,

but provision to low-income communities are often seen as infeasible, economically.

Capital costs to expand the system to serve low income areas are always given the lowest preference. This is related to their affordability to pay the connection fee as well as the consumption fee. Yet, in Madras, this marginalised society paid the private tankers as much as 33 times the cost charged by local authorities. A similar situation can also be seen in Jakarta (Bappenas, Unicef and Dian Desa, 1990) and Bandung, where low income earners are marginalised, the competition for water is scarce, but willingness to pay the street vendor results in several fold the normal price. Therefore it not just a matter of the inability to pay.

Water Pricing and the Principle of Equity

There are four main principles required to develop a method of water pricing, they are; allocative efficiency, equity, financial requirement and public health (OECD 1987). The principle of equity is based on the principle of income redistribution and social equity. In water supply, this is the so-called cross subsidy. There are many examples where the principle of cross-subsidy becomes absurd since the development of water supply is non-existent in many low income communities. As safe water becomes scarce, the willingness to pay becomes extremely high. In Jakarta, there are about 3,000 water vendors who distribute water. One m^3 may cost up to 40 times the price of the social category (Dian Desa, 1990). In this case the principle of cross subsidy does not work in reality.

Ideally, water should be provided and allocated in an economically efficient manner so that it benefits the community as a whole, derived from the use of water resources being maximised. The OECD suggests applying a marginal cost pricing system that reflects the incremental cost to the community in satisfying marginal demands. These incremental costs cover production, operation and maintenance, water disposal and environmental conservation costs.

Pricing systems in use for pipe services (water supply, sewerage and sewage treatment), are classified as follows:

- Flat rate tariffs (water fees which are not directly related to quantities of water used, but based on number of residents, rooms, taps, size of service pipes and ground area or property class)
- Average cost pricing (total water services cost is divided among the number of units, to generate a unit cost)
- Declining block tariffs (where succeeding blocks of units of water consumed are sold at lower and lower prices).
- Increasing or progressive tariffs (higher consumption exceeding the given blocks may pay a higher rate).

The method used in Indonesia is heavily influenced by an 'orthodox' pricing system. Water pricing is calculated based on operation and maintenance costs plus the depreciation costs of the capital. Water disposal and the environmental conservation costs, such as the need to preserve the catchment area, are not components of the pricing. On several occasions, the government has tended to maintain the water tariff as low as possible, as dictated by political views. This is counter productive to the idea of market forces, and hinders PSP. This method does not promote a sustainable provision of water supply.

Summary

In conclusion, this chapter has shown that economic activities are the greatest influence on the concentration of population, therefore the best tool to slow down the rapid urban growth is balanced regional development. This is the best incentive for people to stay, particularly in rural areas. Therefore, public investment for the provision of infrastructure and services can be delivered at an optimum allocation. The solution to the lack of infrastructure and services provision in urban areas (particularly to urban poverty) is not just about the need to provide the necessary services, but to provide employment as well.

PSP related to providing infrastructure in most cases, will accelerate the provision of infrastructure and services. For example, leasing or contract management but complete divestiture of public assets should be done slowly and with care. The next chapter will focus on the issues of urbanisation, poverty and private sector participation, in the context of Indonesia.

Chapter 3

POPULATION, URBANISATION AND PROBLEMS OF DEVELOPMENT IN INDONESIA

3. 1 Introduction

Indonesia is facing the problems of increasing population common to many underdeveloped countries. The pressures of population and its related problems mean many people do not always have enough to eat. The fundamental approaches to alleviating poverty and under-nourishment encompass creating employment opportunities and ensuring sufficient incomes. In urban areas, one of the primary issues is how to provide sustainable infrastructure and a high level of basic services to all citizens, particularly targeting the urban poor who have the greatest needs.

This chapter will examine urban problems in Indonesia, specifically in relation to the provision of infrastructure and services. One of the main issues addressed in this chapter is the necessity for a balanced developmental approach. This thesis is also concerned about the low level of income in Indonesia being a major cause of inadequate living standards.

3. 2 Population of Indonesia

The population of Indonesia in 1971 was estimated to be 119 million and has increased to 204 million in the last 3 decades (BPS 1998:P55). The majority of the population (58%), the island of Java, which comprises only 6.58% of Indonesia. The largest islands, such as Sumatera, Nusa Tenggara, Kalimantan, Sulawesi and Maluku/West Papua share the rest; or 85 million (42%) of the country's population. Kalimantan, which is the biggest island, (or 28% of the total area of Indonesia), is occupied by 11.1 million people

(approximately 5% of the population). The lowest populated areas are in Maluku and West Papua. These two islands are populated by only 4.3 million people, yet constitute approximately 26% of the total area of Indonesia (refer to Table 3-1).

Table 3-1: Population of the Main Islands, 1994 – 1998 ('000)

Main Islands	Area (km2)	Year				
		1994	1995	1996	1997	1998
Sumatera	482,393	40,100	40,969	41,726	42,468	43,209
Jawa	127,499	113,582	114,987	116,525	118,075	119,631
Bali, Nusa Tenggara, Timor Timur	87,744	10,830	10,982	11,173	11,362	11,552
Kalimantan	547,891	10,237	10,520	10,738	10,956	11,176
Sulawesi	191,800	13,524	13,770	14,022	14,270	14,519
Maluku & West Papua	499,852	3,940	4,051	4,134	4,219	4,363

Source: Table 3.1.3, P55, BPS, S4, 1995, figures are rounded up

The average increment of the Indonesian population from the years 1971–1998 ranges between 3.0 to 3.6 million (refer to Table 3-2). The year from 1997 – 1998 indicates the annual incremental population is 3.0 million.

Table 3-2: Indonesian Population & Growth, 1971 - 1990

Year	**1971**	**1980**	**1990**	**1995**	**1996**	**1997**	**1998**
Millions*	119,203	147,490	179,379	194,755	198,320	201,353	204,392
Yearly increment**		3,143	3,189	3,075	3,565	3,033	3,039

* Table 3.1, ** Calculation

The density of the Indonesian population is defined as the ratio of population to square kilometres (km^2). There is tremendous variation in population density from one area of Indonesia to another (Table 3-3). The population density on the island of Java in 1980 was 715 people/ km^2 and this has rapidly increased to 938 people/ km^2 in 1998. The lowest population densities are found in Maluku and West Papua, where in 1980 they had a density of 5 people /km2, and this increased to only 9 people/km2 in 1998. The highest population density found in Indonesia is in Jakarta. In 1980, the density was 9,761 per km^2, but this had increased to 14,291 km^2 in 1998.

Table 3-3: Population Density in the Main Islands, 1980 – 1998

Main Islands	Area (km2)	Population Density per km2				
		1980	1990	1995	1997	1998
Sumatera	482,393	58	76	85	88	90
Jawa	127,499	715	843	900	926	938
Bali, Nusa Tenggara, Timor Timur	87,744	97	116	125	129	132
Kalimantan	547,891	12	17	19	20	20
Sulawesi	191,800	54	65	72	74	76
Maluku & West Papua	499,852	5	7	8	8	9
DKI Jakarta	664	9761	12392	13724	14117	14291
Indonesia	1,937,179	76	93	101	104	106

Source: Table 3.1.3, P55, BPS, S4, 1995

In contrast Kalimantan, the biggest island, had a population density of 12 in 1980 and 20 in 1998, where Sumatera, the second biggest island increased in density from 58 in 1980 to 90 in 1998. On average, the population density in Indonesia in 1980 was 76 and has increased to 106 in 1998. The current average density in Indonesia is approximately equal to Asia (106), but is higher than Latin America (23) and also Africa (14).

Another significant parameter, concerning the population issue in Indonesia, is the rate of population growth. During the period 1971 – 1980, the Indonesian National Statistical Bureau recorded the annual population growth rate as 2.32% and this slowly decreased to 1.66% in the period 1990-95 (Table 3-4). These figures indicate that the doubling time of population, in Indonesia, has been increased from 30 to 44 years.

During the period 1971 – 1980, Jambi, Bengkulu, Lampung and Kalimantan Timur provinces recorded an annual population growth of more than 4%, but have now decreased to just over 3% in 1990-1994. Riau, Kalimantan Barat, Kalimantan Selatan, Sulawesi Tenggara and Irian are the provinces in which population growth increased in the period 1990-94 as compared to the period 1971-1980. Kalimantan Timur (East Kalimantan) shows the most rapid rate of population growth in Indonesia 4.28%.

Table 3-4: Indonesian Population & Growth, 1971 – 1990 (1,000)

Propinsi	Tahun			Tahun		
	1971	1980	1990	1971-80	1980-90	1990-95
DI Aceh	2009	2611	3416	2.93	2.72	2.41
Sumatera Utara	6622	8361	10256	2.6	2.06	1.62
Sumatera Barat	2793	3407	4000	2.21	1.62	1.56
Riau	1642	2168	3304	3.11	4.3	3.38
Jambi	1006	1446	2020	4.07	3.4	3.24
Sumatera Selatan	3441	4630	6313	3.32	3.15	2.69
Bengkulu	519	768	1179	4.39	4.38	3.63
Lampung	2777	4625	6018	5.77	2.67	2.04
DKI Jakarta	4579	6503	8259	3.93	2.42	1.99
Jawa Barat	21624	27454	35384	2.66	2.57	2.07
Jawa Tengah	21877	25373	28521	1.64	1.18	0.78
DI Yogyakarta	2489	2751	2913	1.1	0.57	0.03
Jawa Timur	25517	29189	32504	1.49	1.08	0.81
Bali	2120	2470	2778	1.69	1.18	0.83
NTB	2203	2725	3370	2.36	2.15	1.59
NTT	2295	2737	3269	1.95	1.79	1.82
Timor Timur	N/A	555	748	N/A	3.02	2.35
Kalimantan Barat	2020	2486	3229	2.31	2.65	2.4
Kalimantan Tengah	702	954	1396	3.43	3.88	3.11
Kalimantan Selatan	1699	2065	2597	2.16	2.32	2.18
Kalimantan Timur	734	1218	1877	5.73	4.42	4.28
Sulawasi Utara	1718	2115	2478	2.31	1.6	1.34
Sulawesi Tengah	914	1290	1711	3.86	2.87	2.52
Sulawesi Selatan	5181	6062	6982	1.74	1.42	1.6
Sulawesi Tenggara	714	942	1350	3.09	3.66	3.29
Maluku	1090	1411	1858	2.88	2.79	2.35
West Papua	923	1174	1649	2.67	3.46	3.34
Indonesia	119208	147490	179379	2.32	1.98	1.66

Note: Population growth (Table 3.4) should be seen as the total natural growth plus migration.

Source: BPS, 1995:31, Table 3.1.2.

The Average Size of Households

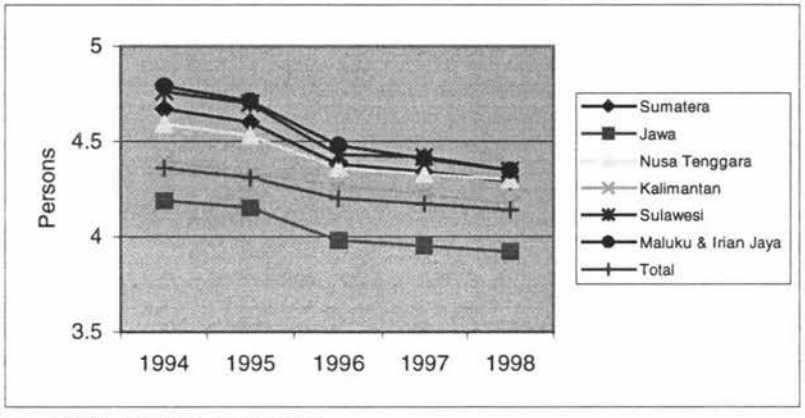
The size of households in Indonesia varies by island, for instance, Sumatera, the second biggest island in Indonesia, has recorded the average size of households as 4.67 persons in 1995 but this decreased to 4.29 persons in 1998 (Table 3.5). The biggest size of households is found in Sulawesi, Maluku and West Papua 4.79 in 1994, decreasing to 4.35 persons in 1998. The average size of households in Indonesia in 1998 was 4.14. As Figure 3-1 illustrates, all main islands indicate a decreasing trend from 1994 to 1998. Many believe that this decreasing trend is influenced by factors such as the increasing level of education, industrialisation and family planning.

Table 3-5: Average Households Size by Main Islands, 1994 –1998

Main Islands	1994	1995	1996	1997	1998
Sumatera	4.67	4.6	4.38	4.34	4.29
Jawa	4.19	4.15	3.98	3.95	3.92
Nusa Tenggara	4.59	4.53	4.36	4.33	4.3
Kalimantan	4.4	4.33	4.27	4.22	4.17
Sulawesi	4.76	4.7	4.43	4.42	4.35
Maluku & West Papua	4.79	4.71	4.48	4.41	4.35
Total	4.36	4.31	4.2	4.17	4.14

Source: BPS, 1998:60, Table 3.1.8.

Figure 3-1: Average Households Size by Main Islands 1994-1998



Source: BPS, 1998 :60, Table 3.1.8.

Despite the size of households in Indonesia being less than five persons, in fact, there are many houses in urban areas that have more than this figure. Some of the urban inhabitants still live together with other relatives or with extended family, such as their children and grand children. Consequently, this thesis will use five people which is still probably conservative as being the size of a household.

3. 3 Urbanisation and Growth

Urbanisation (that is the increase in the proportion of national population living in urban areas) in Indonesia from 1960 to the 1970s was comparatively slow. Like other areas of South-East Asia, rapid urbanisation was not occurring at

this period, and an incorrect impression was seen by Davis (1972), Goldstein (1975) and Jones (1972). It took 10 years to increase the urban population from 15% in 1961 to 17.4% in 1971 (Supas, BPS, 1995); later in 1995 it has reached 35.9% (Table 3.6). The annual size of urban population increment from 1970 to 1980 was 1.2 million, but this increased to approximately 2.9 million people from 1990 to 1995. As in most societies, the pattern of urbanisation in Indonesia has followed an S-shape, building up very slowly, expanding very quickly and probably will begin to slow down (Friedman and Wulff,1975:442 as cited in Abercrombie et al, 1994).

Table 3-6: Urban Population in Indonesia 1961 – 1995

Year	1961	1970	1980	1990	1995
Indonesia population		118,000	147,490	179,379	194,755
%	15	17.4	22.27	30.9	35.9
Urban Population		20,532	32,846	55,428	69,917
			70-80	80-90	90-95
Urban Increment / year			1,231*	2,258	2,897

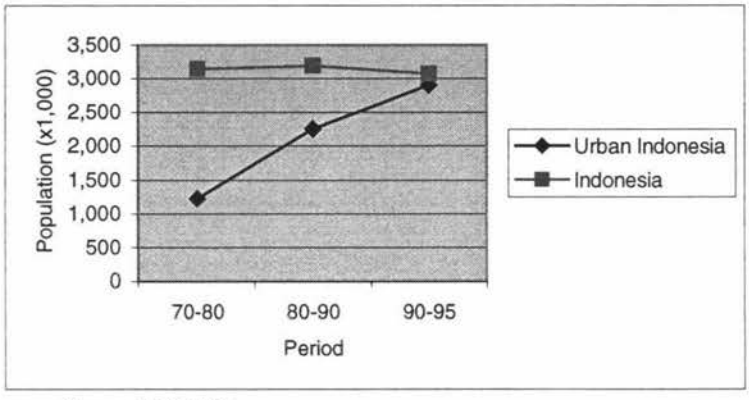
Source: Supas, BPS, 1995, *: Estimated

According to the National Statistical Bureau (Supas 95, BPS, 1995), physical development and foreign investment in urban areas use both skilled and unskilled resources, but leave most of the unskilled rural people behind. The low skill level of rural people is of course a major barrier to social mobility and greatly restricts the individuals ability to participate in a wide range of activities, including taking advantage of services provided by the government. On the other hand, the presence of unskilled rural people in urban areas enables class exploitation, for example, unskilled labour earns insufficient wages to meet even basic needs. Firman (1998:233) accused both national and foreign companies in Jakarta and West Java of exploiting unskilled workers, and the question remains unanswered whether these investments are sustainable in the future.

Based on the analysis of the Fifth Five Year Development Plan, Anne Both (Forbes, 1996:36) has noted that success in industrial development in Java,

mainly Jakarta and West Java, attracted more employment opportunities in this region than anywhere else. Consumer expenditure in Java and Bali rose more quickly during the 1980s than it did in the outer islands. Java was projected to be responsible for about half of Indonesian's total exports. Statistical data reveals that almost half of foreign investment, which was a crucial aspect of economic reforms and development in Indonesia, was located in Jakarta and West Java from 1967 to 1982. Even, by the late 1980s, nearly three quarters of foreign investment approval were located in those two provinces (Ibid:37), although the combined population of these two provinces is less than one-quarter of the total Indonesian population.

Figure 3-2: Annual Population Increment



Source: Supas, BPS 1995

Urban population growth is increasing (Fig. 3-2) through the migration of people from rural to urban areas, and the transformation of rural areas into urban areas, and natural increases of urban populations. Hence the need for growth in housing and other basic needs, including infrastructure and services should be more than the increasing demand related to urban growth.

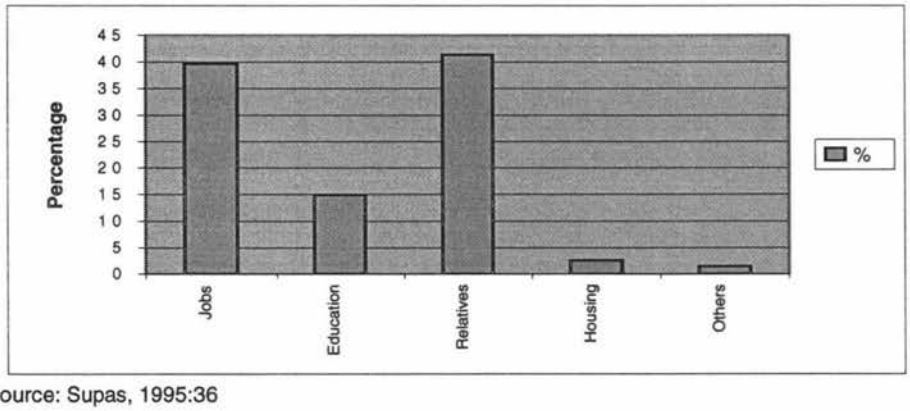
Motivations

Unequal distribution of income is of course synonymous with inequality in general since it exerts a major influence upon variation between different groups in their ability to obtain basic needs and accessibility to public services (Hugo et al in UN, 1981:14). Hugo who studied urbanisation in Indonesia, reported that the fall of rural income in the 1970s relative to that of urban

income showed a substantially widening ratio of urban-rural income ratio of between 2.06 and 1.79. Disparities between urban and rural populations are not just confined to income (Porter, 1999). Other issues, such as health accessibility to doctors, paramedics, medications, and the availability of equipment necessary for medical treatment were also unequal. Regardless the appropriateness of the facilities, rural people are treated differently when compared with those in urban areas. Illiteracy rates of people aged over 10 years are found to be twice as high as in rural areas (1970-1976), but later trends suggest that there was an ongoing improvement. Overall, data reveals that in urban areas, infant mortality rates are reported significantly lower, whereas life expectancy is 14% higher than rural areas (Cho et al in UN 1981).

In the context of motives for migration to urban areas, a recent study made by BPS in 1995, found that for Indonesia, as for other countries motives are underpinned by economic factors (Fig. 3-3). This includes a significant proportion of the participants decision to move which relates to the presence of their relatives (Fig. 3-2) in urban areas. The evidence from Jakarta indicates that personal connections are important means of choosing the destination and acquiring employment (Brunn and Williams, 1993:415). But over all, the key factor is still economic (Supas, 1995: 36). The issue of widening disparities between urban and rural areas were found to be the major issue underpinning the decision to move.

Figure 3-3: Reasons for Urbanisation in Indonesia 1961-1995

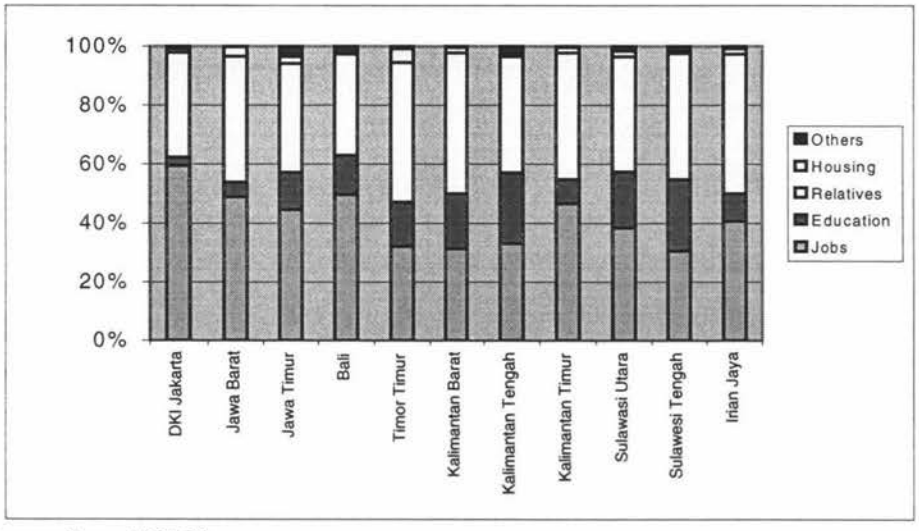


Source: Supas, 1995:36

The combined figures for urbanisation driven by the economic motives (employment and relatives) in Indonesia is approximately 80%. The Java island is the most popular destinations for employment; the most popular destinations were Jakarta, Province West Java, whereas outside Java were Bali and East Kalimantan (Fig. 3-4).

Jakarta is an example of unnecessary concentration of economic scale (Firman, 1998) which has caused, not just economic problems, but also social and environmental problems (Pernia and Alabastro, 1997). In the case of Yogyakarta, a large population influx is due in great part to the educational facilities and to other related economic opportunities in this city.

Figure 3-4: Motives for Migrants Moving from Rural to Urban by Province, 1961-1995



Source: Supas 1995:36

No one can stop people from migrating, when compelling economic pressure exist in their own region, and other areas appear to promise better opportunities. The findings of Both (Forbes, 1996) concerning the imbalanced allocation of developmental budget in Indonesia is probably the best way of explaining why people always end up in the largest cities, such as Jakarta and West Java, instead of staying in the rural areas. Therefore, population concentration and change, industrialisation, structural change and development are fundamentally interrelated (Porter et al, 1999).

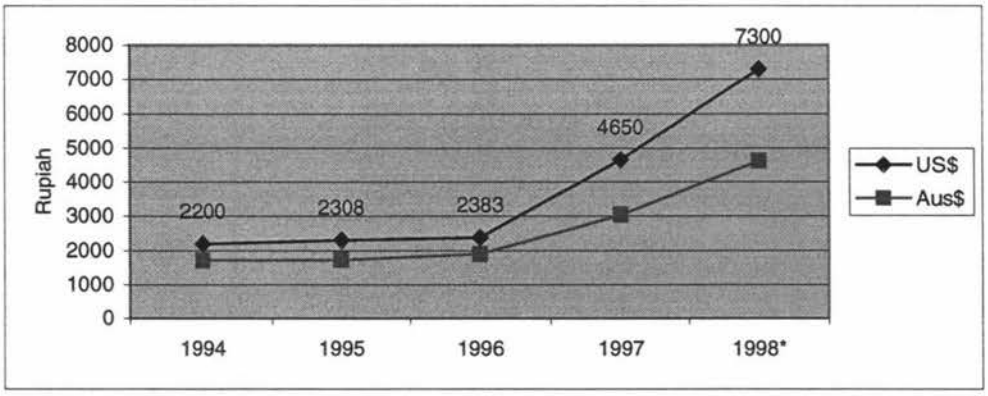
3. 4 Economic Crisis and Urban Poverty

The Impact of Economic Crisis on Development

The Indonesian government sounded an alarm due to the continuous pressure on the Indonesian currency (the Rupiah). It was driven to an uncontrollable level, in 1997 by the economic crisis which struck Asia. This tremendous economic turmoil weakened the Rupiah from its stable value during 1994 to 1996 (BPS, 1998). Indonesia suffered greatly, and was also burdened with internal political problems, especially trying to dis-empower the military from the political stage. The result was the step-down of Suharto, who had been in power for 32 years.

The model of administration developed by Soeharto was based on the military and centralised power (Econit, 1999). Under this regime, corruption, collusion and nepotism (CCN) grew uncontrollably. Collaborating with the elite, which in turn accumulated capital to allow those practices to maintain its power (Forbes, 1996), and difficult to eradicate (Brunn and Williams, 1993). The result was a very volatile economy, which totally depended upon international monetary assistance. The first indicator of the impact was seen in the Rupiah which suffered a sudden contraction from its considerably stable position. For example, the Rupiah which was Rp. 2,383 in 1996 but weakened to Rp 7,300 in 1998 per 1US$ (BPS, 1998; Figure 3-5).

Figure 3-5: Selected Foreign Exchange Middle Rates Against Rupiah, 1995-1998



Source: BPS ,1998: Table 9.2.18

A rescue programme resumed by IMF and other donor countries has been able to stop the Indonesian economy from total bankruptcy. Millions of dollars have been injected in to the financial budget by the international budget, hoping to stop further social disruption.

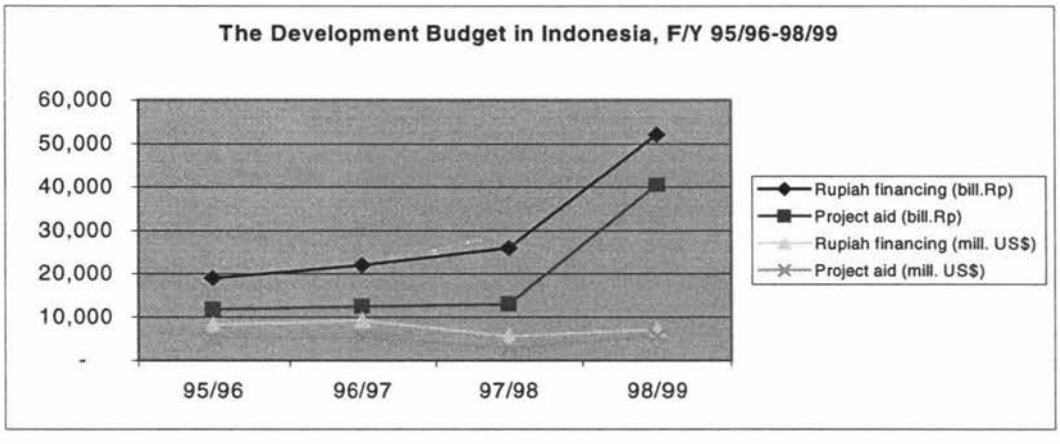
Table 3-7: The Budgeted Government Expenditure, 1995/96-1998/99

Kind of Expenditure (in billion Rupiahs)	95/96	96/97	97/98	98/99
A. ROUTINE EXPENDITURES				
Expenditures (Personnel & Pensions)	15,347	18,281	21,192	24,781
Material expenditures	4,745	6,588	8,895	11,425
Subsidies to autonomous regions	8,410	10,012	11,536	13,290
Interest and debt repayment	18,215	20,227	19,571	66,236
Other routine expenditures	524	1,005	965	55,473
B. DEVELOPMENT EXPENDITURES				
Rupiah financing, Rp	19,024	22,089	25,902	52,142
Project aid, Rp	11,759	12,414	13,026	40,541
	78,024	**90,616**	**101,087**	**263,888**

Source: Table 9.1.3, BPS 1998:434

In the context of development, despite the increase in development budget from Rp 39 trillions in Financial Year (F/Y) 1997/98 to Rp 92 trillions in F/Y 1998/99 (Budget: ref. Table 3-7 and Fig. 3-6), it does not necessarily reflect the greater effect on development. In terms of international currency, such as the US$, the budget (refer also expenditures, Table 3-8, Fig. 3-7) is significantly lower than it should be.

Figure 3-6: The Development Budget in Indonesia F/Y 95/96 – 98/99



Source: Adapted from Table 3-7

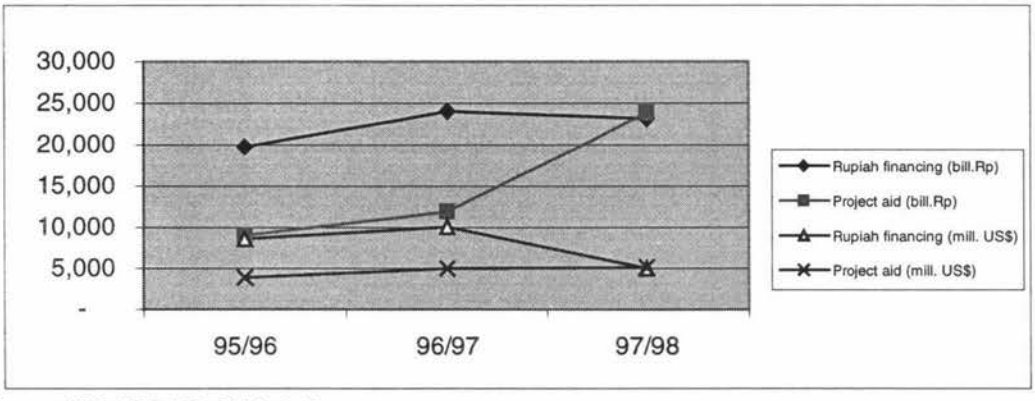
This is the opposite of the F/Y 1996/97 experience, where the increase in the budget (in Rupiah), consequently increased the budget in terms of US$. A consequence of the drop in the Rupiah was the increasing prices of goods and services which in turn impacted on the increasing number of people living in poverty.

Table 3-8: The Actual Budgeted Development Expenditure in Indonesia, F/Y 95/96 - 97/98

Kind of Expenditure Realisation (in billion rupiahs)	95/96	96/97	97/98
Rupiah financing (bill.Rp)	19,772	24,052	23,121
Project aid (bill.Rp)	9,009	11,900	23,817
Total in rupiah currency	28,781	35,952	46,938
Rupiah financing (mill. US$)	8,567	10,093	4,972
Project aid (mill. US$)[1]	3,903	4,994	5,122
Total in US$ currency	12,470	15,087	10,094

Source: BPS 1998:426, Table 9.14.

Figure 3-7: The budgeted Development Expenditure in Indonesia, 95/96-97/98



Source: BPS 1998:426 , Table 9.14.

Urban Poverty

Bright Light cities, such as Jakarta, Bandung, Surabaya and others in Indonesia, exhibit problems related to poverty as those in the Third World countries. For some migrants, adaptation processes in urban areas are always uneasy. In the streets, there is enormous number of street vendors.

[1] Foreign exchange rate is based on middle rates against the Rupiah, where 1 US$ = Rp. 7,300, in Nov. 1998 shown in Table 9.2.18 Indonesian Statistic 1998, (BPS, 1998:456).

Some of them are living in appalling slums and squatter settlements, often along canals or rivers. Many beggars roam the streets and markets in the day, whereas at night time, prostitution is quite obvious. Often a migrant must repay debts from his or her wages, and this barely allows one to purchase a daily of rice sprinkled with some vegetables or bean curd, or if they are lucky with some meat (Brunn and Williams, 1993:415). After long hours of work, often irregular hours, they return to quarters, and take a bath with polluted water. At night, they sleep with a hope that they can earn money for tomorrow's life. These are a few examples of the bitterness of living in urban poverty.

The technical measurement used to set, or define, the poverty line is an arbitrary one. In Indonesia, it includes the following components: daily calorie intake and non-food minimum requirement, these needs are converted to a monetary value. This definition can vary from other countries. The World Bank, for example, defines absolute poverty as per capita income of less than US$ 370 a year (Engelman, 1997). The full technical measurement of the 'Poverty line in Indonesia' (BPS, 1998:574) is as follows;

> *The 'Poverty line' used is measured as the daily minimum requirement of 2,100 kcal per capita plus the non-food minimum requirement, such as for living, clothing, schooling, transportation, household necessities and other basic individual needs. The value of expenditure (in Rupiahs) needed for fulfilling the basic minimum requirement including food and non food is called poverty line.*

The level of the 'poverty line' in urban areas of Indonesia in 1998 has increased by almost 21 times the 1976 value, whereas in the same period, the poverty line in rural areas increased approximately 25 times (Table 3-9). The percentage of the urban population living below the poverty line decreased from 38.8% in 1976 to 21.9% in 1998. Over the same period, the percentage of the rural population below the poverty line decreased to 25.7%. The successful decrease in percentage, particularly in urban areas, does not indicate a decrease in the number of those who are poor. The number of

people living below the poverty line in urban areas was 17.6 million in 1998, whereas rural areas record 31.9 million people.

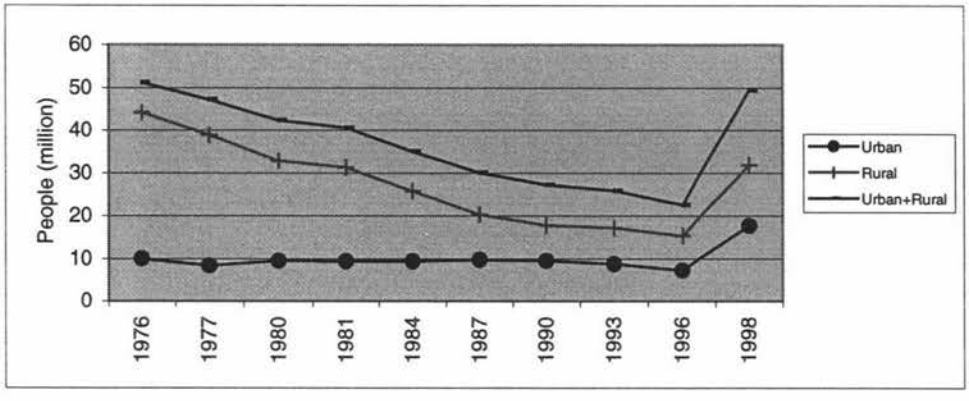
Table 3-9: Poverty Line, Percentage, and Number of Population Below the Poverty Line, 1976-1998

	Poverty Line (PL)		% Population below PL			Population below PL		
	Urban (Rp.)	Rural (Rp.)	Urban (%)	Rural (%)	Urban + Rural	Urban (mill.)	Rural (mill.)	Urban +Rural
1976	4522	2849	38.8	40.4	40.1	10	44.2	51.2
1977	4969	2981	30.8	33.4	33.3	8.3	38.9	47.2
1980	6831	4449	29	28.4	28.6	9.5	32.8	42.3
1981	9777	5877	28.1	26.5	26.9	9.3	31.3	40.6
1984	13731	7746	23.1	21.2	21.6	9.3	25.7	35
1987	17381	10294	20.1	16.1	17.4	9.7	20.3	30
1990	20614	13295	16.8	14.3	15.1	9.4	17.8	27.2
1993	27905	18244	13.4	13.8	13.7	8.7	17.2	25.9
1996	38246	27413	9.7	12.3	11.3	7.2	15.3	22.5
1998	96959	72788	21.9	25.7	24.2	17.6	31.9	49.5

Source: BPS 1998:576, Table 12.1.

The turning point in the percentage of people living below the poverty line lies in the years between 1996 – 1997. During these years, the stability of the Rupiah, weakened to a level of uncertainty, and continuing to 1998 increased in the number of people living below poverty back to 1976 (Fig. 3-8). Thus, national development, which has been carried out since 1969 and aimed at maintaining economic stability and increasing economic growth rates and GDP, has now collapsed.

Figure 3-8: Number of People Under The Poverty Line by Urban and Rural Areas



Source: BPS, 1998:85, Table 3.2.16.

The turmoil hit the entire business sector, notably in the most urbanised areas, such as Jakarta and West Java, and other large cities. Economic activities in urban areas are starting to slow down, and many companies are beginning to layoff their employees, causing a rapid increase in the unemployment rate (Firman, 1999:239).

Brunn and Williams (1993) state that the urban poor are generally better off than the poor in rural areas. This is one of the reasons why many have migrated in the first place. At least they still survive by shifting to the urban informal sector (Forbes, 1996). Although they have to work longer and on irregular hours, and have a low rate of wages, but they still earn more than when compared to rural wages. This shows that there are substantial factors to pull migration to urban areas in Indonesia. Brunn and Williams (1993) suggest that there is a need to reorient strategies, such as decentralise industry, reduce regional disparities and improve rural income.

3. 5 Labour Income and Human Resources

One of the most important issues of concern in this thesis is labour force income. The focus being the insufficiency of the salary or wages that they earn which is not even enough to meet basic needs. It is important to explore how many urban workers and their families survive with low pay. Part of the discussion relates to public servants. Despite the fact that they are only about 4 million (BPS 1998:p31), their role in Indonesia is quite strategic, as they are responsible in bringing about development to entire areas of Indonesia. Therefore, part of the discussion will also include the issue of human resources.

The median monthly salary of production workers (Table 3-10) in 1998 ranges from Rp 214,000 to Rp 651,000 (1 US$ = Rp 7,300), whereas civil servant category I to IVE, in Indonesia (in 1997) ranges from Rp. 135,000 – Rp. 722,500 (Table 3-11). At the same time, a Labour Ministry decree has set a

3,000 kcal daily intake for a worker (Note: instead of 2,100 kcal for the poverty line), with their food containing 55 grams of protein (Labour Ministry decree No. kep-81/Men/1995).

Table 3-10: Monthly Average Wages of Production Workers in Indonesia 97-98

	Manufacturing		Hotel		Mining	
	Average	Median	Average	Median	Average	Median
Dec. 97	211.2	184	219.2	154	444.8	427
Mar. 98	212	180.8	288.4	206.4	576.8	538.8
Jun-98	229.2	192	284	208	638	541.2
Sep-98	252.4	214.8	326.4	208.8	720.8	651.6

Wages x 1,000

Source: Table 3.2.16. BPS 1998:p85

Table 3-11: The salary of civil servants in Indonesia in 1997

CATEGORY	Salary Min.-Max* (Rupiah)	Total Civil Servant	Proportion to total civil servant(%)
Category I(Ia-Id)	135,000 - 293,500	364,086	8.9
Category II (IIa-IId)	162,000 - 460,000	1,863,649	46.05
Category III (IIIa-IIId)	241,800 – 593,800	1,744,782	42.65
Category IV (IVa-Ivd)	282,900 –722,500	97, 910	2.4
	TOTAL	**4,090,437**	**100**

Length of experience from 1 year to 32 years,

Source: Kompas, September 13, 1998.

A market survey, carried out by Kompas in week 5, August 1998, signalled the following findings (Table 3.12):

- The total minimum monthly expenditure of civil servants for food in Jakarta is about Rp 168,161 for singles, whereas a family of 5 people (parents and three children) would spend Rp 632,264.

- An estimated 45 – 60 percent of total expenditure will be allocated for non-food items, hence the single labour expenditure will be Rp 420,404 and for a family Rp 1,580,000.

If we compare the poverty line in 1998 set by the government, Rp 96,956, this figure could be partial and difficult to justify in comparison to the market survey made by KOMPAS. When and where the survey was conducted could make the figures different, however the components of expenditures that were taken into consideration by KOMPAS seems to be more comprehensive.

Table 3-12: Table 3.13: Minimum Monthly Needs for Living

	Single	Family
Food	168,610	632,264
Food w/o rice	129,833	486,617
Estimated KHM (food+)	305,708	1,149,571
Housing + ...etc.	420,404	1,580.660

Kompas, September 13, 1998

This finding reveals that over 90% of civil servants and their families have financial constraints in meeting their basic needs. If we relate the case of low paid labours in Indonesia, we will see that there are two elements that we can adjust. Firstly, as Zimmermann points out, we can improve the salary of the worker by minimising the number of the workers. Another option is to double the income of the workers by maximising the productivity of the workers. The first alternative may create social problems, whereas maximising labour productivity is not free from constraints. Therefore, there must be a particular size of population that maximises real productivity (Zimmermann, 1989:3).

An unskilled worker may demand salaries which at least meet the needs of his family. Therefore, it will be between the figures proposed by KOMPAS. The increase could be 100%, which was the advice given by a senior minister of Singapore, Lee Kwan Yew to the new government of Indonesia, early in the year 2000.

Human Resources

As stated earlier, the civil servant plays a leading role in bringing about development in Indonesia. Their responsibilities includes effective co-ordination of the developmental programmes of government bureaux and to implement existing policies and regulations (Douglas in Satterthwaite,

1999:434). The programmes encompass broader aspects, and needs for public services, such as, education, production technology, monetary systems, processes of rationalisation of institutions, democracy, check and balance between executive, legislative, judicative and clean government (Damanhuri 1996:208). Poverty elimination is also part of these programmes.

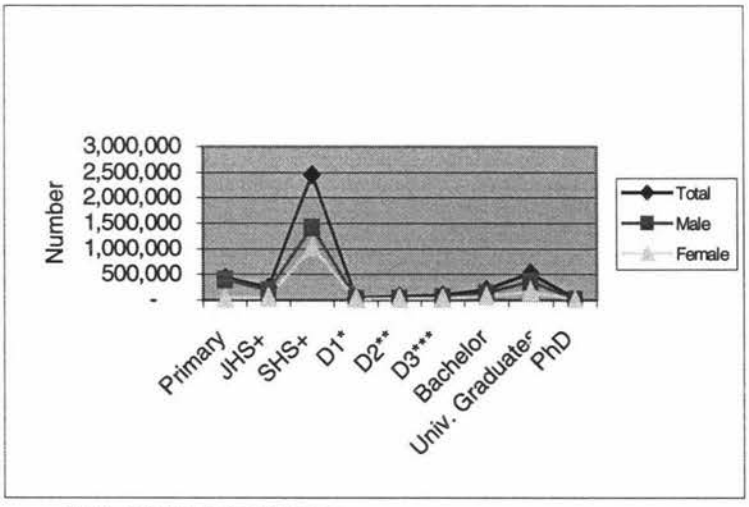
The majority of the staff gaining qualifications is equivalent or less than 'senior high school' 77% (Table 3.13 and Fig. 3-9). With this qualification, most of them are in the middle rank IIA – IIIC (the rank of civil servant in Indonesia varies from the lowest rank IA to the highest, IVE).

Table 3-13: Number of Civil Servants by Educational Level, March 1988

Education Level	Total	Male	Female
Primary	429,985	400,243	29,742
JHS*	249,945	193,728	56,217
SHS*	2,452,547	1,417,768	1,034,779
D1*	50,013	25,279	24,734
D2*	65,804	32,427	33,377
D3*	94,563	55,101	39,462
Bachelor*	207,943	139,015	68,928
Univ. Graduates	529,492	371,830	157,662
PhD	10,145	8,254	1,891
Total	4,090,437	2,643,645	1,446,792

* or the similar level, Source: Table 3.2.13, P82,BPS,1988

Figure 3-9: Number of Civil Servants by Educational Level, March 1998



Source: Table 3.2.13, P82,BPS,1988

The distribution of civil servants by ratio to the total population throughout Indonesia is slightly uneven, for example, the ratio of civil servant to the total Java population is 1.77%, Sumatera 2.05%, Nusa Tenggara 2.37%, Kalimantan 2.42% and Maluku-West Papua 3.22% (Table 3-14). Despite the ratio of civil servants to population tends to increase the further the distance from Java island, however it does not necessary improve the quality of service.

These great responsibilities that has been put forward to civil servant poseses question about their capability to fulfil such demands properly. The recent evaluation made by the legislature (Kompas, 4 December 1999) concerning the role of National planning agency concluded the lack of capability of civil servants to exercise their role. The centralised approach, imbalanced developmental orientation, and failure to include local cultural and social incapability of civil servants.

Table 3-14: Number of Civil Servants by Ratio Population, March 1998

Province	Civil Servant (x10)	Indonesian Population (x1,000)	Ratio Civil Servant / population (%)
Sumatera	88,394.8	43,209.0	2.05
Java	212,262.7	119,631.3	1.77
Nusa Tenggara	27,357.3	11,552.7	2.37
Kalimantan	27,050.7	11,176.1	2.42
Sulawesi	40,109.5	14,519.6	2.76
Maluku & West Papua	13,868.7	4,303.8	3.22
Indonesia	409,043.7	204,392.5	2.00

Source: BPS, 1988:p64, Table 3.2.3, and P55, Table 3.2.15,

3. 6 Infrastructure in Indonesia

The responsibility for developing infrastructure in Indonesia during the last 50 years lies within three main ministries; the Ministry of Public Works, responsible for physical development; Ministry of Internal Affairs which co-ordinates the operation and maintenance of infrastructure; and the Ministry of Finance which operates financial and administration matters. The policies of

urban infrastructure development in Indonesia state (IUIDP, 1987) that urban infrastructure development, operations and maintenance are, in principle, within the authority and responsibility of Local Governments with the assistance and guidance from Provincial Level and Central Government. Planning, programming and identification of investment priorities to be improved, are based on decentralised and integrated approaches.

Although the local governments are under the advisory of provincial and central government through the Integrated Urban Infrastructure Development Program (IUIDP), implementation frequently does not always follow the programme in reality. For example, uncoordinated project implementation between roads, drainage, water supply, telecommunication and power authorities exist. Frequently, after a road had just been completed, another authority comes to complete the road again.

In this case, the IUIDP remains just a programming document. The IUIDP has never been completed as an operational document, but as a tool to seek foreign loans. The end result defines the appropriate functional and financial responsibilities of central, provincial and local government in project cycles (Tim Koordinasi IUIDP, 1987). The division of roles is unclear, because the vast majority of the programme is executed by central and provincial governments. After more than 10 years of the implementation of the IUIDP, there is no indication that there is an improvement in the local government's capability to mobilise resources and optimise the use of funds. Again, IUIDP is misused by the policy makers as a means of corruption. 'Marking up' the project value and costs were normal practices. It is a complete disaster in the history of development in Indonesia.

The increase in urban population has raised questions about the implications of this trend, particularly urban infrastructure and services, namely; water supply, sewerage, solid waste and roading. One of the most important elements of infrastructure, closely associated with the water supply, is roading. Availability of roads is also a pre-condition for the improvement of economic development, such as mobility of goods, services and population.

The development of road infrastructure has been given high priority in comparison to other infrastructure in the development of Indonesia. In 1977, the total length of roading was 142,700 km, where approximately 35% of the total was asphalted road. Twenty years later, the length of the roads have been increased to 341,400 km or almost 2.5 fold in length in 1977. The asphalted roads have increased to almost four folds the length in 1977 or equal to an average increase of 7,000 km of asphalted road per year. The annual average increase of length in total from 1977 to 1997 is 20,000 km (Table 3.15).

Table 3-15: Road Length by Type of Surface

Year	Asphalted	Non-asphalted	Others	Total
1977	49,319	85,017	8,458	142,794
1982	69,488	88,272	10,547	168,307
1987	99,467	117,048	10,829	227,344
1992	150,930	146,239	28,272	325,441
1997	192,668	132,237	16,562	341,467

Provincial and District Public Work Offices
Source: Directorate General for Road Construction

The responsibility or authority, for operating and maintaining the roads is shared by three main levels of government: state, provincial and district. Their responsibility is not strictly associated with the provision of funding, but rather administrative responsibility. In fact, central government covers the cost of operation and maintenance for districts which have no funding capacity to do so. The budget can be from internal and external sources, such as from national revenue (taxation, customs, overseas revenue) and external sources comprising grants and loans (AIDAB, 1991).

Table 3-16: Road Length by Level of Government Responsibility

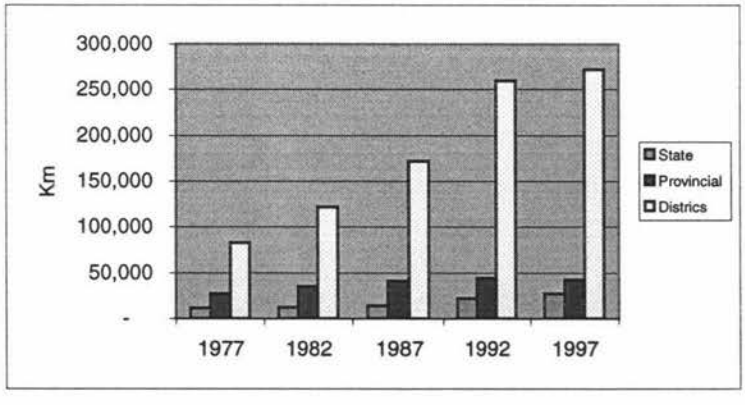
Year	State	Provincial	Districts	Total
1977	11,335	27,486	82,978	121,799
1982	12,164	34,625	121,518	168,307
1987	14,138	41,075	172,131	227,344
1992	22,119	43,730	259,592	325,441
1997	27,127	42,205	272,135	341,467

Provincial and District Public Work Offices, Source:Directorate General for Road Construction

Most of the road development during the past 20 years (1977-1997) was allocated to district area responsibility. The district roads which in 1977 were 82,900 km, have increased enormously to 272,100 km in 1997, the provincial roads from 27,400 to 42,000 km, the state road only increased from 11,300 km to 27,100 km (Table 3-16).

The increase in district roading have been a major area of direct concern for the development of the towns, particularly for human settlement, and to promote an efficient pattern of mobilising goods, services and population. This is reflected in the annual budget allocation for this sector, for example, in 1989/94 was 19.1% of development budget. The increase in districts roads from 1977 – 1997 almost three fold (Figure 3-10). However, it does not necessarily indicate the capacity of local government to expand services. Most planning and implementation were directly controlled by central government. It is not just limited to the case of roading, but to the entire Indonesian infrastructure and services. Overall, local governments do not have a significant input in the process of development, although they do have the necessary amounts of natural resources to cover the costs of development.

Figure 3-10: Road Length by Level of Government Responsibility 1977-1991 (km)



Source: Directorate General for Road Construction

For the sake of social justice, the centralisation approach has given the central government the power to exploit natural resources and accumulate capital from the periphery. However, it never resulted in what the people were

hoping for, but instead resulted in imbalanced development (Damanhuri, 1996, Anne Both as cited in Forbes, 1996:36). When the door of democracy was widened by the legitimate government, the periphery demanded decentralisation and rationalisation of budgets, to allow them to decide their own needs.

Summary

In conclusion, this chapter highlights the problem of rapid urban growth in Indonesia and the search for solutions. Many believe that migration to urban areas is fundamentally underpinned by economic activities. Reorientation strategies, such as the decentralisation of industry, reduction in regional disparities and improving rural income are offered in order to slow down migration to urban areas.

In the next chapter, the discussion will be focussed on the provision of clean water in urban areas of Indonesia. It discusses issues, such as, the level of provision, Unaccounted For Water (UFW), human resources and affordability.

Chapter 4

CLEAN WATER SUPPLY IN INDONESIA

4.1 Institution of Clean Water Supply in Indonesia

Piped Water supply in Indonesia had been established during the era of Dutch colonialism, for example, the Dutch founded Jakarta water supply in 1918 and certain areas began to consume piped water in 1922 (Dian Desa, 1990:3-1). Other water authorities, such as, Serang Water Authority was established in 1885, and the Tangerang Water Authority was founded in 1923 (Herijanto, 1998: 49,52,55). Not until 1962, following independence, did the Indonesian government establish a new form of institution working for the provision and delivery of clean water (UU No.5, 1962). The institutions[2] were owned and managed by local government, the Perusahaan Daerah Air Minum (PDAM[3]). They exist in most districts under the management of local government (level two), except PDAM Jakarta. The vast majority of services are in urban areas.

In 1996, there were 303 PDAMs in Indonesia of various size and responsibility: 116 have consumers less than 5,000 connections, 102 have connections

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[2] Institutions apply to formal organizations or 'deliberately constructed human groupings'. Institutional development refers to efforts that are intended to improve the functioning of a given institution (or set of institutions) so that they can perform more effectively, e.g. by improving their financial management systems, or training their staff. This is sometimes called 'institution-building' (Eade, 1997:6).

[3] Badan Pengelola Air Minum (BPAM) is an institution established by the Ministry of Public Works to serve water supply in districts and municipalities. BPAM is managed and subsidized by central government with the expectation that in 5 years time, it will generate revenue equal to the total expenditure of operational and maintenance (O&M) cost. It is called the 'break event point', although the break event point should refer to the revenue which is equal to O&M plus depreciation cost. When BEP is achieved, BPAM is handed over to local government and the status is converted to Perusahaan Daerah Air Minum (PDAM), 'local government water supply enterprise'.

between 5,000 – 10,000 units, 4 between 50,000 – 100,000 connections and 4 have connections[4] of more than 100,000 (Table 4-1).

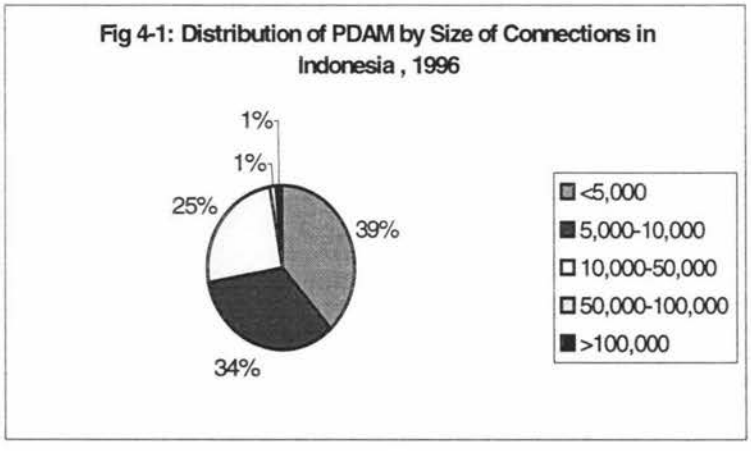
Table 4-1: Distribution of PDAM by size and Location, 1996

Co-ordinating Area	TOTAL	TOTAL CONSUMERS				
		<5,000	5,000-10,000	10,000-50,000	50,000-100,000	>100,000
1	55	25	19	10	0	1
2	45	10	11	20	2	2
3	71	16	31	23	1	0
4	54	35	13	5	1	0
5	78	30	28	19	0	1
TOTAL	303	116	102	77	4	4

Source: Direktori 1998, p362

The above table is also presented in pie diagram (Figure 4.1) to illustrate that the majority of PDAMs fall below the 10,000 connections category (73%).

Figure 4-1: Distribution of PDAMs by Size of Connections in Indonesia, 1996



Source: Direktori 1998, p362

[4]Ministry of Home Affairs (MoHA) classify PDAMs into four by the size of their connections; (1) class A: up to 10,000 connections, (2) class B: 10,001 – 50,000, (3) class C: 50,001 – 100,000, and class D those who have more than 100,001. In 1996, there were 218 (73 percent) class A PDAMs. A quarter of the total is classified as PDAM class B, where as the larger PDAMs, classes C and D each have four enterprises. (Figure 4-1).

4.2 Connections

The Indonesian PDAMs group their connections into six main categories; (1) social consumers, (2) house connections, (3) government connections, (4) commercial connections, (5) public connections[5], and (6) industrial connections. From a total of 3.2 million connections in 1994, 88% were delivered to households, followed by commercial connections (6.77%) and the rest were addressed to social, public and other connections (Perpamsi,1996). In 1996, the number of PDAMs' connections had increased to about 3.8 million.

How significant is the additional ±650,000 connections for the two year period 1994-1996? Firstly, the largest increase was mainly in the house connection category; 537,000 units (81% of total connections, ref. Fig 4-2), followed by commercial and industry (35,000) and then public connections (26,500 units). The increase, of 26,500 units, in public consumers, and the 537,527 house connections is equivalent to approximately 2.6 million people (Table 4-2).

Table 4-2: Increase of PDAMs Connections, 1994-1996

Year	Total (units)	Social	House Conn.	Government / Military	Commercial / Industry	Public Conn.	Estimated Pop. Served
1996	*3,862,492*	*64,295*	*3,397,692*	*93,935*	*253,504*	*53,066*	*22,300,000*
1994	*3,219,985*	*77,219*	*2,860,165*	*37,836*	*218,307*	*26,458*	*16,900,000*
Increase	*642,507*	*(13,024)*	*537,527*	*56,099*	*35,197*	*26,508*	*5,400,000*

Source: Direktori Perpamsi 1996 & 1998

Assumption: 1 House connection = 5 persons & 1 Public connection = 100 persons

If we use 'five'[6] people as the average size of a household, instead of six as suggested by Chatib (Direktori 1996:243; and 1998:365) or 4.14 as BPS pointed out for 1998,

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[5] Public Connection is connection which is used by the public, or a number of community based water users. The facility is located in a certain area as a public owned facility. The cost of using the facility is relatively affordable and meant to be for the use of low income communities

[6] Different interpretations on the total numbers of 'connections' may occur, for example, PDAMs include both active and inactive connections in their reports; assuming the inactive connections will soon be re-activated. The numbers of connections always change from time to time. The number of people served

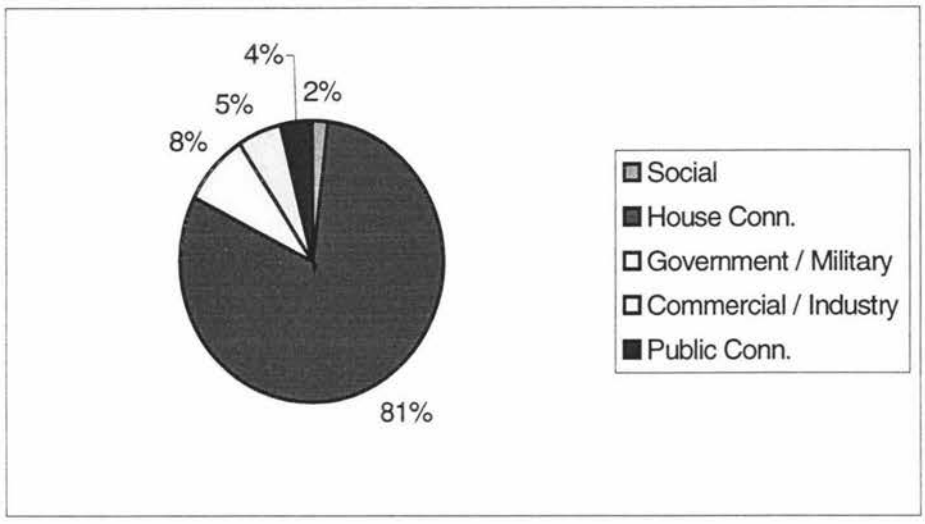

Figure 4-2: PDAM Connections Increase by Category (%)

(BPS, 1998:60, Table 3.1.8) and assume one public connection will serve 100 people[7]; the increase in service would be equivalent to an increase of 537,527 (new connections) x 5 + 26,508 (public connections) x 100 = 5.338.435 million people, say 5.3 million people. In the same period of time (1994 – 1996), the annual increase of the urban population was 2.9 million. This rapid increase would suggest that in time all will have access to clear water. The first fact found relating to this 'connections' issue is: 'Every increase of 5.8 million in the urban population during the period 1994–1996 will decrease access to clean water for 500,000 people'. It can also be expressed as an increase of one million people will decrease access to clean water in urban areas for approximately 100,000 people. In other words, there is not enough provision of clean water for the increase of population in the urban areas of Indonesia.

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under military connections is unclear. Government connections mainly serve government office buildings. There is always a margin of error in estimating the number of people served. The mixed number of connections between government and military has made impossible to estimate the proportion of military connections. Therefore it will be excluded.

[7] In some technical reports, the standard number of people served by one public connection is various. Infratama Yakti used 50 for the case of Cilegon (Infratama Yakti, 1997), Dili W/S uses 100 people (Dili Master Plan, 1996) , it depends on the availability of water, and the concentration of people, and the accessibility of the human settlements.

Technically, the provision of clean water under the public management in urban areas of Indonesia during the 1994 – 1996 was negative in growth. Per definition, it cannot be categorised as development, not even constant, but deteriorating. It raises question about the capacity and the capability of public service to bring about development in this sector. The ratio of public connections to house connections is also important. In the Third World, especially characterised by the existence of low income communities.

In 1996, the ratio of the numbers of house connections to public connections was 3,397,692 : 53,066, hence, the total population serviced is 17.0 million by house connections and 5.3 million by public connections gives a total of 22.3 million people. This means that 23.7% of the consumers are served by public connections. This figure seems to have increased in comparison to 1994, when it was only 15.6 percent.

National Target and Coverage

PDAM coverage may be defined as the proportion of people served by clean water provided by PDAM to the total people in the designated area. It may vary from one PDAM to another. Some may define the coverage as the proportion of people served by PDAM in the coverable or serviceable area, whereas others use total population in one district, hence, the total population varies depending on the definition adopted by a particular PDAM.

The total population served by PDAMs in 1996, as indicated by a total of 3.4 million house and public connections (refer to Table 4-3), is approximately 22.3 million people. The total estimated 73 million urban population covered by PDAMs, is approximately 31%. This coverage is equivalent to 11 percent of the Indonesian population. In 1994 the coverage was just 25% of the urban population or 9 percent of Indonesian population.

Table 4-3: Distribution of Consumers by Category in Each Province and Co-ordinating Areas, 1996

KORWIL		KOMDA	Total PDAM	Total Connection	Social	House Conn.	Government/ Military	Commercial/ Industry	Public Conn.
I	1	Aceh	10	58,517	4,403	49,068	918	3,860	268
	2	Sumut	17	363,838	4,854	302,463	27,020	28,470	1,031
	3	Sumbar	14	111,229	3,938	98,834	1,357	5,194	1,906
	4	Riau	8	43,927	2,234	36,721	525	4,309	138
	5	Jambi	6	62,735	777	28,139	28,832	4,658	329
		Subtotal	**55**	**640,246**	**16,206**	**515,225**	**58,652**	**46,491**	**3,672**
II	6	Sumsel	10	125,822	1,204	106,431	891	7,257	10,039
	7	Bengkulu	4	26,229	644	23,887	513	906	279
	8	Lampung	5	41,530	567	37,233	632	2,530	568
	9	DKI Jakarta	1	396,707	2,852	342,543	2,222	47,124	1,966
	10	Jabar	25	607,883	6,446	556,684	4,532	33,079	7,142
		Subtotal	**45**	**1,198,171**	**11,713**	**1,066,778**	**8,790**	**90,896**	**19,994**
III	11	Jateng	34	474,230	7,231	429,298	5,919	24,625	7,157
	12	DI Yogyakarta	6	65,214	639	60,222	1,230	2,136	987
	13	Kalbar	8	82,462	1,883	68,288	893	10,767	631
	14	Kalteng	6	30,740	365	28,228	758	917	472
	15	Kalsel	10	73,048	4,600	63,566	271	3,624	987
	16	Kaltim	7	113,083	1,341	104,330	606	6,081	725
		Subtotal	**71**	**838,777**	**16,059**	**753,932**	**9,677**	**48,150**	**10,959**
IV	17	Sulut	7	86,398	2,614	78,638	1,207	3,482	457
	18	Sulteng	5	28,893	408	25,698	687	1,869	231
	19	Sulsel	23	127,858	2,291	114,345	1,217	8,349	1,656
	20	Sultara	5	18,707	576	17,299	203	503	126
	21	Maluku	5	27,784	405	23,168	1,540	2,297	374
	22	West Papua	9	113,083	507	32,206	833	1,712	340
		Subtotal	**54**	**402,723**	**6,801**	**291,354**	**5,687**	**18,212**	**3,184**
V	23	Jatim	37	589,314	8,129	532,121	6,652	30,917	11,495
	24	Bali	10	176,126	2,835	153,730	2,981	14,577	2,003
	25	NTB	6	46,960	1,703	41,843	537	1,661	1,216
	26	NTT	12	37,762	755	33,869	552	2,126	460
	27	Timtim	13	9,898	94	8,840	407	474	83
		Subtotal	**78**	**860,060**	**13,516**	**770,403**	**11,129**	**49,755**	**15,257**
		TOTAL	***303***	***3,862,492***	***64,295***	***3,397,692***	***93,935***	***253,504***	***53,066***

Source: Direktori Perpamsi, 1998:363, Table 4.

Table 4-4: PDAM Population Coverage, 1996

No.	Total Enterprises	Province	Population Coverage (%)
1	11	Aceh	*45*
2	17	Sumut	37
3	14	Sumbar	38
4	8	Riau	32
5	6	Jambi	30
6	10	Sumsel	34
7	4	Bengkulu	30
8	4	Lampung	
9	1	DKI Jakarta	54
10	24	Jabar	39
11	36	Jateng	35
12	6	Yogyakarta	39
13	7	Kalbar	30
14	6	Kalteng	35
15	10	Kalsel	46
16	7	Kaltim	32
17	7	Sulut	46
18	7	Sulteng	
19	21	Sulsel	37
20	5	Sultera	35
21	5	Maluku	52
22	8	West Papua	43
23	38	Jatim	30
24	9	Bali	72
25	6	NTB	38
26	12	NTT	42
27	13	East Timor	39
		TOTAL	

Source: Direktori Perpamsi, 1998

These coverage figures are different to the estimates presented by Perpamsi[8], due to different adopted assumptions. Perpamsi assumed that the size of one house connection is equivalent to 6 persons, where this thesis adopted 5 persons. If we adopt a similar assumption: 1 house connection is equivalent to 6 persons, then the service coverage becomes 35% of the urban population[9]. The difference becomes quite significant.

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[8] Association of PDAM in Indonesia is called Perpamsi. The Indonesian Water Supply Association or in Indonesian language is called: Persatuan Air Minum Seluruh Indonesia (Perpamsi). It was established in 1972 It plays a role mostly in capacity building and institutional development or strengthening.

[9] Majority of the beneficiaries are located in urban areas, however there is a small proportion of rural areas covered under PDAMs's service, especially where the water resource is drawn from rural sources. urban service, however, PDAMs have not enough data to suggest the exact proportions.

4.3 Unaccounted For Water (UFW)

One of the performance indicators of efficiency in delivering water is the percentage of water losses in comparison to production. The term for this is 'Unaccounted For Water' (UFW), which is the sum of technical and administrative losses. ADB records, of 25 selected rapid developing urban areas in Asia in 1993, indicate that the losses were high. For example, UFW in Jakarta and Madras was approximately 57%, Karachi (60%), Metro Manila (58%) and Hanoi (53%), and most of the others were above 30%, regardless of the high level of coverage achieved by these water authorities. UFW is an indicator of inefficiency.

Is there any relationship between UFW and the continuity of service? Engineering wise, no, because technically, water authorities can provide excessive volume of water to compensate water loss (UFW). However, the practical way that PDAMs use is to reduce supply time to less than 24 hours. Intermittent supply is a short-term solution, providing equitable pressures to most critical areas, by dividing the distribution network into zoning systems.

Consequently, continuous service in some areas (sub-networks) has to be interrupted while others are being served (the low income earners have their water supply interrupted in order to cater to the needs of the richer). Pipes in the interrupted sub-networks may not be under pressure, or may be totally isolated. The capacity of water required to generate normal pressure in the interrupted sub-network becomes higher than normal.

Unfortunately, this temporary solution has brought disaster to most enterprises who choose to maintain this method. Because, on the other hand, if the required pressure in the distribution system is insufficient, consumers tend to find alternative solutions to help increase the pressure. The most popular ways of doing this are to connect the pipe to a motor pump, or to increase the size of the service pipes or to by-pass the water meter. This results in a more serious

situation, where the consumption pattern changes over time. These short-term alternative solutions are found to be the main causes of reduction in services of water management, together with the increase in usage and demand.

Table 4-5: Selected Indicators of Efficiency in Public Waterworks

Country	City	Number of Hours Available	Unit Production cost	Unaccounted for Water	Account receivable (in months)
PRC	Beijing	24	0.032	28	
	Guangzhou	24	0.017	25	
	Shanghai	24	0.018	12	
	Tianjin	24	0.043	24	2
India	Bombay	5	0.035	36	2.5
	Calcutta	10	0.034	30	2.0
	Delhi	7	0.021	42	
	Madras	3	0.095	57	9.5
Indonesia	Bandung	6	0.066	42	2.7
	Jakarta	19	0.066	57	1.5
	Medan	24	0.131	34	1.0
Korea, Rep. Of	Seoul	24	0.131	42	0.3
	Ulsan	24	0.138	30	1.0
Malaysia	Kuala Lumpur	24	0.027		1.0
	Penang	24	0.064	37	1.5
Myanmar	Mandalay	24	0.100	22	17
	Yangon	8	0.023	33	
Pakistan	Karachi	5	0.036	60	
	Lahore	20	0.023	30	
Philippines	Cebu	18	0.145	38	0.8
	Metro Manila	16	0.037	58	4.0
Thailand	Bangkok	24	0.071	31	3.1
	Chiang Mai	24	0.204	39	0.7
Vietnam	Hanoi	12	0.012	53	1.2
	Ho Chi Minh	24	0.016	41	0.9

Note: Blank space, data N/A

Source: ADB (1993), table 15, Pernia & Alabastro.

Other water authorities may choose long-term solutions by providing back-up water production whenever required. Reducing UFW has been found to be less attractive because of its complexity and it also requires a great amount of effort,

not just technical solutions and administrative solutions, but also social aspects, such as participation, empowerment, control and law enforcement. It requires a longer period of time as compared to technical solutions, which just increase production of water.

It is quite rare to find the water supply in Third World cities operating continuously over 24 hours. Data collected from 25 countries (Table 2-10), reveals that only half provided continuous service (24 hours). Karachi, with 60% UFW can only provide 5 hours service per day, where Madras provides the lowest: 3 hours supply in a day. Despite the supply time dropping to only 3 to 5 hours, PDAMs still consider the consumers as part of their coverage. It is difficult to define what is really coverage if consumers are only able to draw water in a very short time. In some places, supply can be interrupted not just on an hourly period, but daily. Some areas reported that they collect piped water every 3 days.

Perhaps one of the biggest issues in the development of water supply in Indonesia is the inefficient allocation of water (UFW). According to the Ministry of Internal Affairs, the rate is reaching an alarming level (40%). This means that 40% of the inflow lost from the system, mainly through physical leakage. Other reasons include administrative mismanagement, such as non-billed water, or illegal connections or through billed water for which the bills were not collected (Depdagri, 1997). MoHA distinguishes the cause of administrative and physical losses (MOHA, 1997:appendix 3, p1), those being:

- Administrative losses resulting from (1) illegal connections, (2) missing and defective water meters, (3) deficient billing procedures, and (4) failure to collect all bill charges.

- Physical losses resulting from (1) visible and invisible network leakage, (2) leakage from service connections, and (3) waste from public standpipes.

Administrative losses

Water connections, unlike power connections, pose relatively little danger for untrained or unskilled people in making illegal connections, even though the quality of work is often substandard. Illegal connections are unregistered connections that are tapped illegally. These can be with or without the 'blessing' of PDAM staff, in order to avoid unaffordable costs for new connections. UFW can also be generated by defective water meters, such as leakage or inaccuracy.

Human factors also contribute to water loss, as indicated by regular complaints made by consumers concerning their inaccurate bills. It is not a secret that meter readers fail to read the consumer's meters, or just present estimated figures as per previous records. When they return, after possibly three months, the record is even greater than their estimate, and this causes complaints.

Physical losses

Technical aspects, such as discontinued services or less than 24 hours service are common practices. Technically, discontinued services will cause low pressure in the distribution systems, when the pipe becomes full again, the pressure built up will frequently cause sudden contractions in the pipes. The weakest section of the pipes where the pressure waves travel, may burst or damage the pipe. Unidentified leaks occur time after time. The poor service performance of the public relation sector of PDAMs creates problems as a result of poor co-ordination between technical and administrative sections. Repairs in the system, being done by the technical section, are often unorganised and poorly co-ordinated, hence resulting in public relations failing to deliver information concerning the interruption of the service to the consumers.

Another constraint is the slow action inherited by a culture of bureaucracy; where often field works carried out by PDAM staff should be based on a set of preparatory administrative documents and approval. They often ignore the fact

that consumers are waiting with uncertainty. Some of the consumers may have a temporary solution, or alternative source, but those who have no access to alternative source will react. They tend to help themselves (such as tapping), resulting in intentional damage. The first step would be to bypass or to disconnect the water meter. If there is a certain number of people involved in similar actions, this will significantly contribute to pressure decreases.

Consumers, living in areas suffering from low pressure, will then seek alternative ways to build up pressure. The rich may use pumps to suck the water, but the poor, who can not afford this, will continue to practice intentional damage. At this stage the degree of damage will extend to the main reticulation network, and PDAM will have lost its capacity to provide equal access to water for all consumers. When this situation occurs, there are three alternative technical solutions which may improve the situation:

- Increasing excess flow of water to the reticulation network.
- Reducing technical and administrative loss which contributes to UFW.
- Reduce the supply time by interrupted supply, and zone to zone basis supply.

In fact, most PDAMs tend to seek a simple solution involving high risk, which is to reduce the supply time. Very few PDAMs have reported delivery of continuous service. This creates more and more problems.

Level of UFW

Government strategy under the sixth Five Year Development Plan 1994/95 – 1998/99 (Depdagri, 1997:2) was:

- Extending urban water supply service area population coverage
- Reducing UFW from an average of 40 percent to 25 percent in large cities and 30 percent in medium and small cities and,

- Enhancing emphasis on human resource development, including strengthened staffing, training and career planning for employees of PDAMs.

The average level of UFW in Indonesia in 1996 was 32 percent (Table 4-6). There was a slight reduction in level as compared to 1994 (40%). Amongst ASEAN countries, Indonesian UFW performance was moderate, with the Philippines and Vietnam (58%), Malaysia at 20% and Singapore 8% (Air Minum No79-9). If we further elaborate the data of UFW by province, and narrow it down by PDAM, it seems that there is no direct relationship between the number of connections and UFW.

Table 4-6: Level of UFW by Provinces in 1996

NO.	Total PDAM In the Province	PROVINCE	UFW
1	11	ACEH	33
2	17	SUMUT	32
3	14	SUMBAR	33
4	8	RIAU	44
5	6	JAMBI	30
6	10	SUMSEL	32
7	4	BENGKULU	29
8	4	LAMPUNG	27
9	1	DKI JAKARTA	47
10	24	JABAR	30
11	36	JATENG	28
12	6	YOGYAKARTA	35
13	7	KALBAR	32
14	6	KALTENG	26
15	10	KALSEL	25
16	7	KALTIM	24
17	7	SULUT	39
18	7	SULTENG	29
19	21	SULSEL	22
20	5	SULTERA	33
21	5	MALUKU	37
22	8	WEST PAPUA	44
23	38	JATIM	28
24	9	BALI	24
25	6	NTB	28
26	12	NTT	28
27	13	EAST TIMOR*	45
		AVERAGE UFW	32

Source: Table 3, Perpamsi, 1998:p363
*: During Indonesian administration.

For example, PDAM DKI Jakarta; the largest PDAM in Indonesia, has more than 340,000 connections. This enterprise is currently experiencing financial burdens

and the management has been handed over to the joint venture of two foreign water authorities. Why is this company facing problems? One of the principle answers is its inefficient delivery of service. Jakarta records the highest rates of UFW at 47%. The second largest province, West Papua, has the next highest record, followed by East Timor[10].

UFW Reduction Programme

The Ministry of Home Affairs (MOHA) instructed all governors and mayors in 1984 to instruct the directors of PDAMs to reduce the loss of distributed water to a level of 29% of the production (MOHA, Instruction No 690-149). However, this instruction was difficult to follow due to the absence of the operational guidelines. What was written on the instruction was not sufficient to meet the desired objectives; MOHA only instructed the installation and monitoring of flow meters at production units and house connections, periodical maintenance and to exercise law enforcement for illegal connections.

Flow Meter or Water Meter

The existence of flow meters, or water meters, is aimed at quantifying the difference between supply-side and consumption-side. There is no other recommendation other than to have this equipment installed throughout the system. However, to install these water meters is not so simple, consequently PDAMs face several problems.

The first problem is the fact that 52 percent (Direktori,1998:363,Table 3) of the raw water source off-take in Indonesia is obtained from surface water. Hence, this requires a complete water process treatment plant. To run a water treatment plant requires high skilled staff who are rarely available in PDAMs, particularly in small scale enterprises. Frequently, PDAMs by-pass raw water instead of delivering treated water, resulting in water meter blockage. The causes of the raw

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[10] East Timor is no longer part of Indonesia since November 1999, but this thesis may still have relevance in discussing the technical data of East Timor's water supply, which was heavily influenced by Indonesia.

water being by-passed by the reticulation network is; (1) unavailability of chemical compounds, (2) lack of skilled people, and (3) lack of discipline. The last two causes will be further discussed in the following sub-chapter 'human resources'.

The second problem, the availability of water meters requires periodical maintenance. At least, every water meter should be re-calibrated every five years, for example, if a PDAM has 10,000 metered connections, the daily calibration will be 6.6–7.0 water meters. For this, a PDAM will require a water meter calibration test bench facility. In 1996, the minimum cost of the equipment, including the workshop, was approximately equal to 3,000 times the cost of one new standard water meter for a house connection. The facility requires at least two skilled staff to run the maintenance facility. Without a subsidy from central government, it is rare that a PDAM would be willing to finance the procurement of this facility. Perpamsi recorded that 124 of 303 PDAMs (41%) own water meter maintenance facilities. This number is double the number of 1994. If we assume the 124 facilities are put into operation, then, the average calibration capacity for 3.8 million connections in Indonesia would be 20 units per day/facility.

Back to the subject of the MOHA instruction, it did not specify how long the PDAM should take to achieve the 29% loss. The absence of this constraint allows room for interpretation, moreover the PDAMs' management bears no responsibility for the consequences of any failure.

Asian Development Bank (ADB) approach on UFW

The Asian Development Bank (ADB), which has been constantly financing water supply development in Indonesia, realises that UFW is one of the biggest problems facing PDAMs. A series of efforts were exercised by PDAMs in order to reduce UFW to a level of 29% in 1985, but the level remains unchanged to the desirable level. In 1997, ADB tried to concentrate on one of its programmes, in the water supply sector in order to reduce UFW. The mission attempted to

alleviate problems associated with UFW through an 'integrated approach': (1) better management, (2) better monitoring, (3) better cost effective technology and (4) increased community participation. The task would be carried out at three levels, central government, local government and PDAMs. The output would be a reduced UFW in 30 PDAMs from 40% to 30% in 2002, and to 25% in 2007(Framework, MOU ADB, MOHA 1997).

It is a realistic level, but raises concerns about the time frame. UFW reduction programmes involve almost all aspects of technical, administrative and managerial concerns. If we refer to the following logical framework (Table 4-7; set for the ADB financing the UFW project), the risks and assumptions highlight that human resources are the central issue in achieving a successful project.

Table 4-7: Selected ADB UFW Reduction Programme

Design summary	TARGETS	RISK & ASSUMPTION
1. PURP.OSE		
Maximise the use of available water resources.	Reduce UFW to an average of 30% by 2002 and to 25% by 2007 in 30 subprojects serving 3 million people in large provinces.	Engineering and administrative performance.
2.PROJECT COMPONENT : *INSTITUTIONAL DEVELOPMENT*		
Capacity Building	Develop improved understanding of UFW by Directors and boards of PDAMs, Management staff and Field staff.	Inappropriate staff are involved in the programmes. Inadequate financial support is provided for training.
Improve UFW administration	Reduce administration losses through improved meter reading, billing revenue collections and control illegal connections	Insufficient staff and institutional motivation.
Community awareness:	Increase community awareness and participation in identifying and reporting water leakage.	Inadequate interest
PHYSICAL INFRASTRUCTURE / EQUIPMENT		
Leakage reductions	Accelerate the identification and repair of water leaks. Replace pipes and connections where economically worthwhile	Quality of management information systems and provision of resources.
Leakage control	Implement appropriate leak prevention programmes, including surveys, mapping, and network zoning and modelling.	Provision of resources.
Water metering	Replace non-functioning meters and implement a sustainable programme to repair and calibrate meters.	Provision of resources

Is this instruction effective? Perhaps before questioning the effectiveness of these instructions, the issue that needs to be clarified by the government, as the

owner of PDAMs is why UFW set to 29 percent? This has always been unclear. Fifteen years after the promulgation of the instruction, the level of UFW remains unsolved because the public sector has failed to address the root problems associated with water service and provision in Indonesia.

4.4 Human Resource Factors

In most of the evaluations of water supply in Indonesia, the human resource factor was one of the greatest concerns (among others). Donors, such as the World Bank, ADB and bilateral aid countries, such AusAID and USAID forced Indonesia to also focus on this issue, because without having qualified human resources, aid from these donors will be less affective. There are four aspects highlighted in this thesis in order to examine these human factors, and these are seen as the most influential factors behind human performance:

- The ratio of consumers to connections
- Educational background of staff.
- Salary of PDAMs' staff.
- Career development.

To service a total of 3.8 million consumers in 1996, approximately 36,000 staff were employed (Perpamsi, 1998: 365), this gives an average ratio of staff to consumers of 9.25 per 1,000 connections. There was an improvement in this figure by the end of 1994, PDAMs employed 32,200 staff, which was an average of 10.4 staff per 1,000 connections (Locussol, 1997:3). Another way to express this ratio is the number of staff to connections, which was 1 staff per 108 connections. This ratio has slightly improved in comparison to with 1994, where the ratio was only 1 staff per 72 connections or 13.8 staff per 1,000 connections (Perpamsi, 1996).

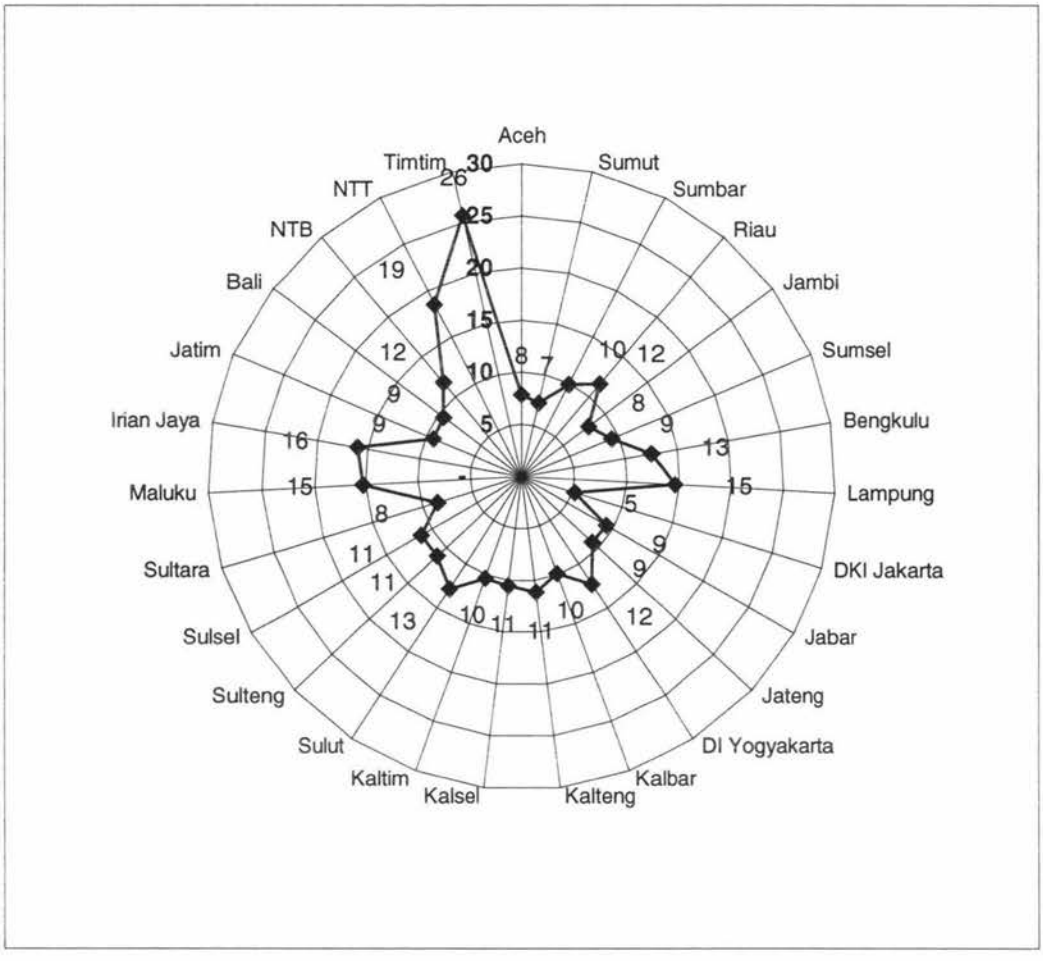
Table 4-8: Average Ratio of PDAM Staff to Consumers by Province

KORWIL		KOMDA	Total PDAM	Total Connection	PDAM staff	Civil Servant	TOTAL STAFF	Staff-1000 connections ratio
I	1	Aceh	10	58,517	382	76	458	7.81
	2	Sumut	17	363,838	2,545	83	2,628	7.24
	3	Sumbar	14	111,229	1,037	62	1,099	10.00
	4	Riau	8	43,927	463	45	508	11.62
	5	Jambi	6	62,735	464	37	501	8.00
		Subtotal	**55**	**640,246**	**4,891**	**303**	**5,194**	**8.13**
II	6	Sumsel	10	125,822	1,002	165	1,167	9.25
	7	Bengkulu	4	26,229	308	21	329	12.50
	8	Lampung	5	41,530	580	23	603	14.49
	9	DKI Jakarta	1	396,707	1,482	617	2,099	5.29
	10	Jabar	25	607,883	5,090	558	5,648	9.25
		Subtotal	**45**	**1,198,171**	**8,462**	**1,384**	**9,846**	**8.19**
III	11	Jateng	34	474,230	4,225	123	4,348	9.17
	12	DI Yogyakarta	6	65,214	774	25	799	12.19
	13	Kalbar	8	82,462	731	83	814	9.90
	14	Kalteng	6	30,740	304	39	343	11.11
	15	Kalsel	10	73,048	672	97	769	10.52
	16	Kaltim	7	113,083	1,130	37	1,167	10.30
		Subtotal	**71**	**838,777**	**7,836**	**404**	**8,240**	**12.82**
IV	17	Sulut	7	86,398	1,051	52	1,103	12.80
	18	Sulteng	5	28,893	303	19	322	11.11
	19	Sulsel	23	127,858	1,325	100	1,425	11.11
	20	Sultara	5	18,707	147	11	158	8.47
	21	Maluku	5	27,784	380	43	423	15.15
	22	West Papua	9	35,577	521	48	569	15.87
		Subtotal	**54**	**325,217**	**3,727**	**273**	**4,000**	**12.29**
V	23	Jatim	37	589,314	4,647	783	5,430	9.17
	24	Bali	10	176,126	1,613	46	1,659	9.43
	25	NTB	6	46,960	533	19	552	11.76
	26	NTT	12	37,762	633	66	699	18.51
	27	Timtim	13	9,898	185	69	254	25.6
		Subtotal	**78**	**860,060**	**7,611**	**983**	**8,594**	**9.99**
		TOTAL	***303***	***3,862,471***	***32,527***	***3,347***	***35,874***	***9.25***

Source: Perpamsi 1998:362-363,Table 2 and 4

The maximum ratio of staff to consumers by province, in 1996, was PDAM DKI Jakarta (5.29 per 1,000 connections) followed by PDAM North Sumatera (7.24 per 1,000 connections), where the minimum was in East Timor (25.6 per 1,000 connections) followed by NTT (18.5 per 1,000 connections). Co-ordinating areas 1 and 2, which are mainly Sumatera and Java island, seem to have a more efficient allocation of human resources as compared to other co-ordinating areas (Table 4.8).

Figure 4-3: The Consumers-Staff Ratio in 1996



Source: Adapted from Perpamsi 1998:362-363,Table 2 and 4

There are four provinces which record a ratio above 15 staff per 1,000 connections; Maluku, West Papua, NTT and Timor Timur (East Timor), whose average ratio in 1996 was 17.51 staff per 1,000 connections. These four provinces are located at the far-east of Indonesia (Eastern Indonesia) and represent 78 of the total 303 PDAMs (26 percent), refer table 4-8 and Figure 4-3. If we examine further the ratios by districts, we will find that there are two districts where ratio connections to staff are less than 50, 10 out of 13 districts in East Timor, during Indonesian administration and 4 out of 8 districts in West Papua. These districts are also located at the periphery of the province (Table 4-9).

Table 4-9: The Four Poorest Provinces: Ratio of PDAM Staff to Connections

PROVINCE	Total PDAM	Total Connection	PDAM staff	Civil Servant	TOTAL STAFF	Staff-1000 connections ratio
Maluku	5	27,784	380	43	423	15.15
West Papua	9	35,577	521	48	569	15.87
NTT	12	37,762	633	66	699	18.51
Timtim	13	9,898	185	69	254	25.6
Total	**78**	**111,021**	**1719**	**226**	**1945**	**18.78**

Source: Direktori Perpamsi

The Educational Background of PDAMs staff

When PDAM status was under the management of central government, central government heavily influenced the recruitment of the staff. The local governments, such as the head of districts, were also an active influential factor in labour recruitment. Employing relatives was normal practice, often without addressing adequate concerns about the appropriate educational backgrounds, or the availability, or demand, for such positions.

Table 4-10: Selected PDAM by Level of Education, Year 1998 and 1996

PDAM	Master	Bachelor	D3	D2/ D1	Senior High	Junior High	Primary	Total Staff	Total Connec-tions
Bondowoso, 1998		2	2		74	3	3	84	9265
1996		2	2		72	3	3	82	8474
Lampung, 1998	0	4	2	0	59	11	9	85	8497
1996	0	5	3	0	121	15	21	165	4457
Tegal , 1998	0	3	3	0	54	5	8	73	5198
1996	0	5	3	0	60	6	8	82	6395
Kab. Bandung, 1998	1	22	21	0	214	30	50	340	33914
1996	0	23	23	0	199	44	51	337	38165
Minahasa, 1998	0	4	6	2	222	29	16	279	26395
1996	0	7	6	2	231	39	17	302	24519
Lombok Tengah, 1998	0	4	6	0	53	12	21	96	8285
1996	0	4	0	0	32	12	21	69	6383

Source: Correspondence, 1999

The small size of PDAMs' operation, as identified by Colussol[11] (1997) limited the ability of PDAMs to attract good managers. He added, that In 1994, there were only about 100 water supply engineers working for PDAMs, or equivalent to only 5% of about 1,900 Indonesian graduates (Colussol, 1997:6). Moreover the regulation and salary policies were not attractive, unless the managers involved themselves in illegal income. Six examples of Class A[12] (less than 10,000 connections) and Class B (10,001–50,000 connections) PDAMs in Java, Sumatera and NTB, in 1996 and 1998 indicated that the vast majority of their staff have a formal educational background of high school or less (Table 4-10 and figure 4-4). Almost all PDAMs employed 90% (or more) of their staff holding High school or lower certificates.

This thesis does not mean to generalise that the percentage of lowly educated staff results in poor performance, but the evidence suggests that there is a reason to question the impact of this on the poor performance indicators of PDAMs in Indonesia. Instructions and guidelines on administration, as well as technical operations, requires a certain level of education. For example, to operate a water treatment plant, it is suggested that at least a three year formal course is required (working in this particular area). Whereas, it is often found that PDAM staff do not have adequate understanding of simple arithmetic operations that they are supposed to have had for their level of education.

Perpamsi supports the idea that one of the main constraints in the development sector in Indonesia is due to the lack of human resources working in this area. As Chatib states (Direktori, 1998:p366);

Indonesia as one of the developing countries, is experiencing high population growth, and also facing great problems in challenging its national

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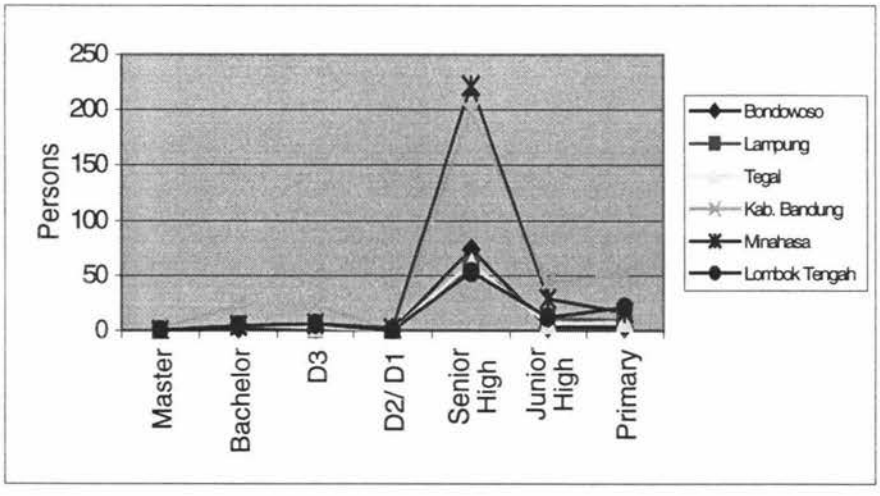
[11] The annual revenue of serving 10,000 connections is typically in the range of US$ 200,000 (equivalent to 1995 prices).

[12] PDAM is divided into 4 classes (A up to 10,000 connections, B 10,001-50,000, C= 50,001 – 100,000, D more than 100,001).

development, including the clean water supply sector. The biggest problem is the human resource capability in terms of numbers and capacity in managing to transfer technology.

The World Bank is also apprehensive about the insufficient resources capacity and capability. They are concerned about the number of water supply engineers working in this area. In 1996, all PDAMs in Indonesia employed only 100 water supply engineers (World Bank, 1996, and Herijanto, 1998) of the total 35,800 staff (Direktori, 1998: p363). Water supply engineers are mainly concentrated in the big enterprises, leaving the smaller ones inadequately serviced (100 engineers to 38,500 staff). PDAMs have an abundance of unskilled labourers.

Figure 4-4: Selected PDAM by Level of Study, 1998



Source: Corespondence, 1999

Salary of PDAMs' staff.

The salary of PDAMs' staff is based on the regulation issued by MoHA and applicable to all PDAMs throughout Indonesia. MoHA divides the salary into four levels and each level is based on work experience within the PDAM. In 1997, the range of the basic salary for level one with no experience up to 27 years working

experience was Rp. 78,000 - Rp. 207,600, and for Level D this ranged from between Rp. 268,600 – 515,200 (MoHA, Permendagri, No 1, 1997).

With regard to income, Kompas has conducted a survey which showed, in 1998, that the minimum living expenditure of a single Indonesia worker[13] in Jakarta was Rp. 420,404, and a family Rp. 1,580,660. Single worker expenditure for food was Rp. 168,161 and for family was Rp. 632,264. Even if the salary of PDAMs' staff were doubled, the amount would only be adequate to cover the expenditure for food. This reality is disturbing, and perhaps contributes to reduced worker productivity, and is the most logical reason for illegal income infringements. Workers also do not have collective bargaining positions to help reduce their financial burdens, unless they can increase the enterprise's revenue. This is almost unachievable, as most PDAMs are trapped by debt.

4.5 Water Tariffs

The Indonesian Constitution (Psl. 33 ayat 3 UUD 1945) states that water is controlled by the state. Under this section of the constitution the goal is to maximise welfare for the people, through the provision of water. Local government regulation number 14(1987) states that water tariffs are based on five factors: cost recovery, affordability, consumption efficiency, simplicity and transparency.

In 1998, the Minister for Internal Affairs defined operational guidelines for the implementation of water tariffs throughout all PDAMs. (IMendagri No 8.1998). Local government regulation number 14(1987), and IMendagri No 8.1998, are still in place. Both local government regulations, and central government guidelines, are expected to work side by side, support one another and should

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[13] SKM RI No. Kep-81 states the KHM constitutes food, shelter, clothing and miscellaneous. The daily calorie intake for workers is 3,000 including 55 grams protein.

not be contradictory. The users are divided into five different categories (MoHA No2 (5), 1998)

- Category 1, includes; public hydrants, public toilets, public tanks and religious facilities.
- Category 2, includes very simple house, orphanages, social facilities, state schools, state hospitals, government offices and military level sub-districts and sub-sub districts.
- Category 3, includes houses, except for very simple houses and luxurious houses, small scale business, household industry, government offices and the military at district level.
- Category 4, includes luxurious houses, industry and big business, government offices and the military at central and provincial level.
- Category 5, includes all consumers excluded from the above categories.

Block of Consumption

The block of consumption is set by PDAMs as a guidance, or basis, for counting the water bill. According to government regulation (MoHA regulation No.2(7),1998), the blocks are 10m3, 10m3 to 20 m3 and more than 20 m3. The minimum block of consumption is 10 m3/consumer/month[14]. This first block consumption is called the 'life line', which is the minimum standard requirement of a household to support healthy life. Every block entails a different tariff rate. For example, if consumer A use 15 m3, then the first 10 m3 will be charged at the tariff rate applicable for the first block, and the next 5 m3 will be charged based on the second block tariff rate. The lower block tariff rate is always cheaper than the following blocks, therefore this tariff is categorised as the 'Progressive tariff'.

In order to accommodate water users, many of whom are poor, water tariffs are set on the basis of cross subsidy, where the rich subsidise the poor. However,

[14] Although the majority of PDAMs use 10 m3 as the first consumption block, PDAM Pekan Baru use 15 m3 (Infratamayakti, 1988), PDAM Dili (Master Plan, 1996)and Covalima use 5 m3 (Master Plan, 1996).

there is still difficulty in distinguishing between poor consumers and those who are not, if the only basis is consumption level. It is also important to also consider socio-economic aspects, such as the class of the human settlement type of house (permanent, semi-permanent or non-permanent), and the size of the premises.

The role of tariffs is very important. Theoretically, the tariffs will show whether a particular PDAM gains or loses, but this is not the only factor behind the successful management of PDAMs. Failure to impose appropriate tariffs, such as those that are too high, may create new problems, such as an increase in UFW. Whereas a tariff that is too low may cause excessive utilisation. Although water is a renewable resource, its scarcity makes it become commercially valuable. If there is an increase in cost components, or a particular PDAM wants to expand the service, one way of recovering cost is increasing tariff, for example PDAM Serang has been implementing the same tariffs structure from 1982 until 1992. To increase it requires a series of processes, such as hearings, discussions and approval from local parliament. But this is not always easy. Current government popularity depends on the quality and the success of the government to deliver an affordable price.

Table 4-11: Tariffs Structure PDAM Dumai, 1990 - 1994

Consumption	Non Commercial	Commercial	Social	Public Connection	Industry / Sea Port
0 – 10	450	900	360	360	1,800
10 – 20	675	1125	450	360	1,800
20^{+}	900	1350	675	360	1,800

Source: FS water Supply Dumai, DGHS, MPW (1995), Table 8-3:p8-10,

Table 4-11 above shows the way a progressive tariff is exercised, except for public connections, such as public taps and public tanks. Records obtained from 24 PDAMs, in West Java in 1997 and 1998, found that the average monthly consumption for one house connection ranged approximately between 22.70m^3–

21.41m^3 (West Java Proposal for Financial Assistance, Sept. 1998). This is equivalent to approximately 143–150[15] litres per capita per day (lcd). If we assume average consumption rates are applicable to other parts of Indonesia, then, the average charge for consumers in Dumai in 1994 ranged between Rp.12,519 to Rp.13,680. On top of this water charge, PDAM will charge other fees, such as administration fees, water meter maintenance fees and others. These extra charges may range from 15–20%, giving a total of approximately Rp. 15,000. Locussol (1997) found that PDAMs tariff structure usually does not meet any of the four basic principles of water tariffs-setting: economic, financial, social equity and administrative simplicity. He added (p5):

> *While the average PDAM tariffs was Rp. 485/ m^3 at the end of 1994, (a) cash cost (operation and maintenance plus debt service) would require that it be set at an average of Rp. 510/m^3, (b) compliance with MoHA regulation (O&M, depreciation and interest on loans) would lead to an average Rp. 765/m^3.*

If we follow the findings made by Locussol on the average tariff, a consumption of 22 m^3, in 1994 would cost Rp. 11,220 and if depreciation costs are included this would be Rp. 16,830. Is this price affordable by most of urban population? This will be discussed in the following pages.

4.6 Affordability

What is affordable, what is unaffordable, is really a contingent response from most people. Two households who have the same size of household members, always have different spending patterns. If household "A" can afford to pay Rp. 15,000 for their water bill, household "B" may not be in the position to cover this

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[15] Locussol (1997) estimated the average clean water gross domestic consumption in urban areas was 130 liters per capita per day (lcd).

cost. Therefore, it is necessary to carry out a proper household socio-economic baseline survey. Say if a family receives an average monthly water bill for Rp. 15,000, what is the income of this household? Is it likely that they can practically afford to pay this water bill? Studies suggest that the bill should be equivalent to 4 percent of income (Infratama-Waseco,1988:2-20; Locussol, 1997). Thus, income should be approximately Rp. 600,000. Following is a further example of a socio-economic survey which was carried out by MPW in Dumai in 1995 (Dumai FS, water supply, May, 1995).

In reference to table 4-12; if we consider that the income distribution, from Rp. 200,000 – Rp. 300,000, is feasible to PDAMs consumers, this means that there is more than 80% of the urban population in Dumai who can afford to meet the 'life line' water provision, which is 10 m^3. However, the normal volume of clean water consumption in urban areas is approximately 22m^3. Thus, only approximately 40% of the urban population in Dumai can afford to consume this volume of clean water. What of other urban dwellers in Indonesia? Do they have similar affordability problems, assuming the families have similar characteristics of expenditure? Is Dumai's case a generalisation of water consumption affordability?

Table 4-12 : Income Distribution Dumai ,1995,

Income Distribution (Rp.)	%	Affordability (Rp.)	Affordable Water Consumption[16] (m3)
> 400,000	25.8	>16,000	25
300,000 – 400,000	22.8	14,000	23
200,000 – 300,000	36.7	10,000	18
100,000 – 200,000	13.8	6,000	12
< 100,000	0.9	<4,000	8

Source: MPW, May 1995, FS Water Supply :p2-9

To answer these questions, the author will refer to the data collected by statistical reports regarding workers' monthly incomes in Indonesia. There were

[16] These are estimated figures without considering miscellaneous costs, such as administration and water meter maintenance costs which are always part of water bill components.

approximately 15,700,000 workers in urban areas in 1998 (this data was obtained from 27 provinces in urban areas).

Firstly, as the income varies from one household to another, statistically, it is important to derive the midpoint income from the given income ranges. Four percent of the midpoint income ranges are treated as the basis for estimating the affordability (MoHA Instruction No.8.B.2, 1998) of workers to cover the cost of clean water consumption provided by the PDAM. Assuming we use the tariff structure of PDAM Dumai for each household as being applicable throughout Indonesia[17], then, we can derive a graph to show the relation between the 4% of income used by Indonesian workers in urban areas. The cumulative percentage of workers who can afford to cover the cost of consuming 22 m^3 of clean water (refer table 4-13).

Table 4-13: Indonesian Average Monthly Income in Urban Areas, 1998

Income Range	Mid-point Income	Number of Labor	4% of midpoint income	% of Total	Cumulative
< 50,000	25000	360,944	1,000	2.3	100.0
50,000 – 99,999	75000	1,122,986	3,000	7.1	97.7
100,000 – 149,000	125000	1,546,281	5,000	9.8	90.6
150,000 – 199,999	175000	2,058,707	7,000	13.1	80.7
200,000 – 249,999	225000	1,909,024	9,000	12.1	67.6
250,000 – 299,999	275000	1,634,310	11,000	10.4	55.5
300,000 – 349,000	325000	1,561,289	13,000	9.9	45.1
350,000 – 399,999	375000	1,204,453	15,000	7.7	35.2
400,000 – 449,999	425000	1,034,337	17,000	6.6	27.5
450,000 – 499,999	475000	729,023	19,000	4.6	21.0
500,000 – 549,000	525000	661,572	21,000	4.2	16.3
550,000 – 599,000	575000	338,261	23,000	2.2	12.1
600,000+	>625000	1,569,265	25,000	10.0	10.0
Total		15,730,452			

Source: Table 14-3, Labourer/Employees Situation in Indonesia, August 1998, BPS

[17] This assumption is just one way to estimate the affordability of urban population clean water consumption.

In fact, table 4-13 suggests that the break event point (BEP) between the above relations is 40 – 43% (Fig 4-5). This BEP indicates the maximum percentage of urban workers who can afford a monthly consumption of 22 m3.

Locussol's works, (who obtained the average tariffs through regression analysis), reflect the majority of tariffs and discounts and the effects of a few extreme high or low tariffs (Locussol, 1997:5). However, this figure did not specifically address the issue of household affordability, but rather potrayed a general picture, for example, the average tariff for DKI Jakarta was Rp. 1,500, while other PDAMs throughout Indonesia, for the same period, was Rp. 680.

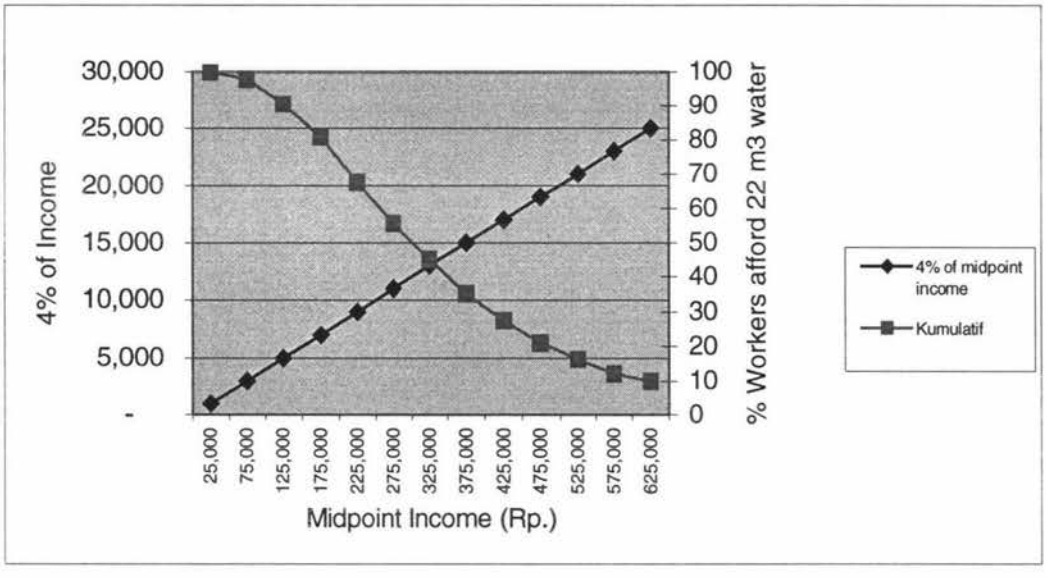


Figure 4-5: % of Indonesian Workers Who Can Afford to Consume 22 m3 Clean Water per Month, 1998

4.7 Effect of Monetary Crisis on Technical and Financial Performance

When the 1997 monetary crisis hit the Indonesian economy, the water supply sector also suffered. This was caused by the fact that a significant proportion of physical inputs were provided by industries dependant on imported raw

materials. While these could be locally made, they were dominated by foreign capital. The increase in foreign currency impacted by increasing the prices of both local and imported products. One example of this is the increase in imported pumps which increased to almost six fold the prices of the products in Rupiah before the monetary crisis.

Let us further examine how the monetary crisis influenced PDAMs in Indonesia. In order to do so, we will further explore the performance data of 24 PDAMs in West Java. One set of data is from 1997, before the crisis, and another set is the data after the crisis, 1998. One way to reduce costs is to reduce water production. The cumulative reduction of the raw water costs for these 24 PDAMs was 64.2% (Simpam, Sept. 1998). The volume of water related to this 64.2% is unverifiable, because it does not necessarily mean a similar proportion of raw water was reduced. Certainly it was reduced, as seen from the reduced average consumption rate from 22.7 to 21.41 m3/connection / month.

Another impact of the monetary crisis was the increase in labour costs. The monetary crisis weakened the purchasing power of PDAMs' staff, who demanded that the PDAMs review their salaries based on inflation. The data prepared, in the proposal to assist 24 PDAMs in West Java in 1998, shows the financial problems of the operational costs as compared to 1997. In 1998, the labour costs which were 25.4 % of total operation cost in 1997 has increased in 12.6%, resulted in the labour costs to become 32.8% of total operational costs in 1998 (Table 4-14). Unfortunately, a 12.6% increase in labour cost was not sufficient enough to boost the purchasing power of PDAMs staff.

The largest cost categories in the PDAM budget is in general administration. In 1997, the proportion was 34.2% and in 1998 was reduced to 25.1%. PDAMs were able to cut 35.8% of their general administration in 1998 as compared to 1997, in order to compensate the increased of other cost.

Table 4-14: The Expenditures of selected 24 PDAMs in West Java, by cost category in 1997 & 1998

Total PDAM	24 enterprises	24 enterprises	-						
Total Domestic Connections	601,756	619,850	18,094				Cost to total ratio		
Total Non-Domestic Connections	42,434	48,102	5,668	(Rp./conn./year)			(%)	(%)	
Total Connections	644,190	667,952	23,762	**COST**					
COST	1997	1998	Balance	1997/conn./ year	1998/conn. /year	Balance	1997 (%)	1998 (%)	Balance
Raw water	1,285,539	460,438	- 825,101	23,947	8,272	(15,675)	12.45	5.11	(7.34)
Labour	2,624,242	2,956,188	331,946	48,884	53,109	4,224	25.42	32.80	7.38
Chemical	514,091	846,294	332,203	9,577	15,204	5,627	4.98	9.39	4.41
Power	732,048	890,399	158,351	13,637	15,996	2,360	7.09	9.88	2.79
Maintenance	1,553,807	1,570,549	16,742	28,944	28,215	(729)	15.05	17.43	2.38
General administration	3,523,097	2,262,079	- 1,261,018	65,628	40,639	(24,989)	34.12	25.10	(9.02)
Non Operation	91,458	26,421	- 65,037	1,704	475	(1,229)	0.89	0.29	(0.59)
TOTAL	10,324,282	9,012,368	- 1,311,914	192,321	161,910	(30,411)	100.00	100.00	-

Source: Proposed Assistance to PDAMs in West Java, September 1998.

Cumulative records made by 24 PDAMs in West Java, in 1998 in comparison with 1997 are as follows (Proposal, Assistance to PDAMs in West Java, Sep. 1998, Table III):

- Number of connections still increases by 3.9%
- Revenue increases: 5.25%
- Operation and Maintenance costs reduced by 12.7%
- Gross Profit relative increases: 36.7%
- % increase in gross profit to Revenue: 3%

Is this good or bad news? It is too early to draw the conclusion that the combined 24 PDAMs were financially healthy. This performance does not reveal the real situation of these PDAMs. Perhaps the PDAMs have failed to address the overall balance, which would include the depreciation costs of their assets. Furthermore, the purchasing power of the urban dweller has not improved, neither has the PDAMs' staff. Who is to be blame, is it fair just to say the 'Monetary Crisis'?

Summary

In conclusion, the increase of services provided by PDAMs did not increase the overall coverage of water provision in urban areas of Indonesia, but just maintained the current level of coverage. This makes it difficult to justify whether there is a development occurring in urban water supply in Indonesia. In Chapter Five, these issues described will be further elaborated on. Discussion on the influential factors will be the focus of the discussions ,aimed at finding alternative solutions on how to reform PDAMs' services.

Chapter 5

REFORMING PDAMs SERVICE

5. 1 The Future of PDAMs

The future of PDAMs is very much dependant on issues such as (1) the macro economy of Indonesia and (2) human resources issues (wages) (3) supervision, (4) professionalism (5) empowerment of people, (6) private sector participation and (7) environmental preservation. This chapter will discuss the need for reforming the approaches of PDAMs in light of the above issues, in order to maintain the level of current service and possibly to bring about accelerated development for the provision of clean water in Indonesia.

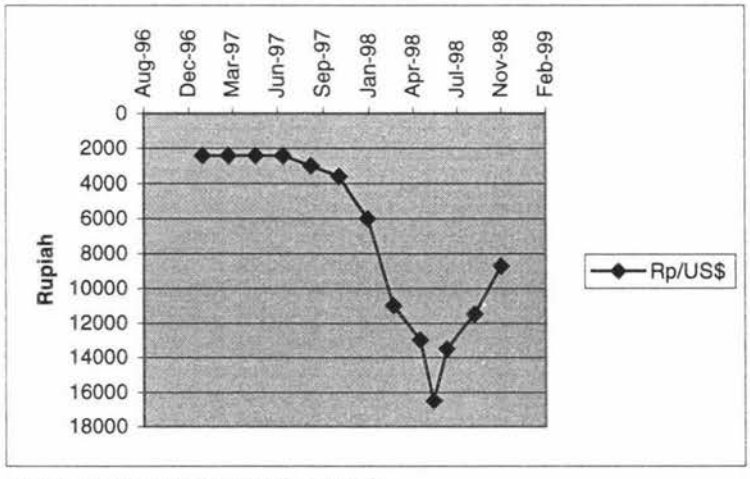
Water Supply in the Context of Macro Economy

In historical hindsight, the Indonesian economy presents a situation of having just entering the era of development. It has gradually made positive advances, but there were quite number of political economists who had warned the Indonesian technocrats of how fragile the foundation of the Indonesian economy was. Unfortunately, this was seen as baseless by the government.

When the wave of economic turmoil hit several Asian countries, Indonesia was the one that bore the largest burden. The inflation rate reached incredible figures of 120 %. This did not just weaken the purchasing power of workers, but millions lost their jobs. Business lost its dynamic, and many goods and services were quoted in American dollars instead of Rupiah. The country's financial system totally collapsed and would not have survived without external financial aid.

The water supply sector was also part of the public sector that was influenced by the economic crisis. For example, the price increase on mechanical goods, such as pumps increased almost four to five fold, depending on the exchange currency rate of Rupiah to the US$. When this was questioned, the suppliers responses were typical, 'We do not want to take any risk'. No one can argue against this response, if we look at the fluctuation of rupiahs against US$ as recorded by The World Bank (Figure 5-1). From January 1998 up to November 1998, the Rupiah was rated at its weakest point. This fall culminated points was sometime in July 1998, when the Rupiah was rated Rp 17,000 per one US$. It was almost six fold the exchange rate in 1997.

Figure 5-1: Selected Rupiah Aprreciation (Rp/US$)



Source: The World Bank, March 1999:3

The Fluctuation of Rupiah

It is quite obvious that the water supply sector has a direct relation with two key economic issues:

(1) the fluctuation of the Rupiah and
(2) the inflation rate.

The depreciation of the Rupiah is still taking place, but is nearing a more stable rate. Arryman of Econit's, expects the Rupiah will stabilise at Rp 6,500/ US$, this is now seen as 'fair value' (Econit Economic Outlook 2000, 1999 in Kompas, Dec. 15, 1999). However, Economists of Econit estimate that the pressure on the Rupiah will still take place until the first semester of 2000, for these following reasons (Ibid):

- The increase of foreign debt which was rescheduled in the previous year (1998).
- The slow growth of exports as compared to the increase in local demand for durable goods that have high imported material content as the result of delayed purchases.
- The tardiness of taking concrete measures on economics cause resulting in a slow back-flow of investment, this will increase the deficit of foreign payments resulting in pressure on the Rupiah. It was around June – July 1998, when the Rupiah traded at Rp 17,000 per US$.

Inflation Rate

High Inflation is felt by most people, particularly the poor. It weakens the purchasing power of people. Therefore, the popularity of government depends on its capability to maintain low inflation rates. The Inflation rate in Indonesia, for the longer period, was always maintained under two digits, but the last economic turmoil has drastically changed the history of inflation rates in Indonesia. If, in July 1997, the general Consumer Price Index (CPI) was below two digits (The World Bank, March 1990:3, Fig.1), this figure jumped to 82% by September 1998 and in particular food prices inflated to 120%.

Again, the water supply sector was significantly hit by this fact. PDAMs, totally depend on mechanical/electrical equipment and chemical compounds for the treatment of raw water, for example, pumps, coagulant (Alum), soda ash and disinfectant. All these prices significantly increased (Box 5.1). All 24 PDAMs in

West Java reduced their production capacity in order to meet the production costs. To increase the water price, long procedures have to be followed. The chance of this was almost zero, because it would burden most consumers who had been loosing their purchasing power. On the other hand, the PDAMs staff demanded an increase in their salary. Again, it was impossible, because an increase in PDAMs' staff salary was only a logical option through the increase of water tariffs. Another option was to tighten the expenditure of complex administration procedures.

Box 5.1:

The Price of Deep Well Pumps for Water Supply During The Monetary Crisis

Pumps play an important role in the production and distribution of water. In 1996, PDAMs extracted approximately 10,125 lps (12.5%) of total 79,840 lps of the raw water from ground water. This is why, the procurement of pumps, and associated mechanical and electrical equipment is one of the big items. Assuming that the capacity of the pumps used by PDAM averaged 15–30 lps, (say 24 lps), and this life time is between 4–7 years[18], say 5 years. It means that the requirement of deep-well pumps ranges between 300–700 units every 5 years, which gives the amount of budget required to purchase these pumps may fall between US$ 3 million to US$ 7 million every five years.

'Goulds' pumps have a capacity of 24 litres per second (lps) (head 80 meter), and were at Rp 24 million in 1996 (ETWSSP). This price is equivalent to approximately US$ 10,000 (Fig 5-1, The World Bank, March 1999). During the crisis, it was quoted by the same supplier, Pt. Tiga Ikan Engineering at Rp 120, million. Why? Simply, because the same pump was originally quoted at approximately US$ 10,000. Moreover, the supplier

[18] Watercare Auckland (1999) quotes the range of useful lives of pumps in machinery category, as 4 – 100 years. However, the author suggests that the technical life time of a deep-well pump ranges between 4 – 7 years. The use of deepwell pump is quite risky, simply because the motor is submerged and runs on high voltage power. Improper handling or operating of the pu mp will be very costly, it could be the same as the price of new pump.

quoted it in Rupiah equivalent to US$, and incredibly, the price validity was based on a daily count. The Rupiah was very volatile and deep well pumps are imported goods.

One way to minimize the impact of the crisis was to delay purchases of certain goods, such as pumps. Seemingly, the end of the crisis is yet unknown, suppliers still quote pumps and some domestic products in US$. Is it a psychological consequence or will the economic turmoil last?

Prospect 2000

'If 1997 is seen as 'A Year of Uncertainty', 1998 is 'A Year of Correction' and, 1999 is 'A Year of Resolution', but, 2000 is seen as a 'Rebirth of Indonesian Economy' (Econit Economic Outlook, 1999 in Kompas, December 16, 1999).

The opening years of the third millenium offers a little hope for the Indonesian economy as predicted by Econit (Ibid) also for the water supply sector in Indonesia, thus the rebirth of PDAMs. As it is pointed out that the long struggle of the Indonesian water supply is dependant on the improvement of the macro-economy. But recent issues on the possible increase in (1) power tariffs, (2) the cost of petrol (Yudhoyono in Kompas Dec. 14, 1999) and (3) salary of civil servant (Sudibyo in Kompas Dec. 10, 1999), should ring alarm bells for PDAMs.

A 35% increase in the base tariff of power and a 20% increase in petrol price is proposed for April 2000 (Ibid). This proposal was made in reaction to the pressure on the government budget which still subsides power and petrol. The argument made by the government is that electrical tariffs in Asean countries outstrip Indonesia, for example, Philippines (Rp. 684), Singapore (Rp. 428), Hongkong (Rp. 767), compare to Indonesia (Rp. 223). The average electrical tariff (Rp/kWh) in Indonesia is only one third of the Philippines. The illustration in Table 5.1 may drive the readers to infer causation, by just looking at the data. Some may argue that the low tariff incurred by Indonesia is because it is eroded

by the depreciation of the currency. A more acceptable argument would be the intention of government to free power companies from subsides.

Table 5-1: Comparison in Power Tariff of Neighbor Countries (Rp/kWh)

Consumer category	Indonesia	Philippine	Singapore	Hongkong	Malaysia
1. Household	194,13	760	517	806	405
2. Commercial	319,58	685	435	759	513
3. Industry	213,01	598	375	720	388
Average	223,01	684	428	767	423

Note: Position, June 1999, Dirjen Listrik

The increase in civil servant wages will certainly affect the rise in labour wages in other sectors, including PDAMs salary. This rise is expected to increase the erosion of workers' purchasing power. However, the increase in power, petrol and civil servants salary will automatically be followed by inflation. Often, inflation occurs ahead of the date of government announcement of the salary increase. This makes people unhappy, because the increase which supposedly to adjusts to inflation will hit by the following inflation. Three possible things happen as an affect of wage, fuel and power increases; (1) workers are better off, (2) workers need more income to maintain the same standard of living, or, (3) the relative purchasing power has still not deteriorated. But overall, people consider inflation to be something bad.

The increase in labour's wages, power and fuel, in the context of PDAMs staff, is not a good story for most of its workers. It will certainly not bring prosperity to PDAMs' staff. The dependence of PDAMs on fuel and power will increase the financial burden of the enterprises. If at present, the estimated proportion of power cost in PDAM in 1998 was 9.9% and labour was 33%. In April 2000, these proportions will be slightly different. Yet further analysis has been made to anticipate the 2000 increase in tariff, but, the total increase in PDAMs costs of

operation, maintenance and depreciation may double the current cost. This is simply because of the delayed purchase of durable goods (pumps) during the crisis plus the increase in prices of above mentioned items. Perhaps the biggest worry is the depreciation cost of most imported goods, as the result of the depreciation of Rupiah currency to dollars.

Inflation creates gainers and losers (Boumol & Blinder, 1991), some will gain, whereas others will lose, some will blame inflation for their misfortune, some will give credit for their good luck. Inflation is not always bad, because sometimes it allows income redistribution and wealth work, but in the context of PDAMs, they remain marginalised, unless any prior change in the Indonesian economy occurs which will improve the purchasing power of people.

5. 2 Employment Issue Wage, Education and Development

'Investing in people, if done right, provides the firmest foundation for lasting development' (World Bank, World Development Report, 1991).

Human input into the provision of clean water in Indonesia has for a long time been sidelined by other issues, such as UFW and the coverage of the water. The fact is that the largest share of the cost for providing water in Indonesia is the payment of labour costs. In 1997, one fourth of total expenditure was to cover labour costs, this proportion has increased to one third of total cost in 1998. This is the rationale for bringing labour input into the focus of discussion.

As quoted the view of Professor Frederick Harbison of Princetown University (in Todaro, 1994:p363) :

> *Human resources constitute the ultimate basis for the wealth of nations. Capital and natural resources are passive factors of production; human beings are the active agents who accumulate capital, exploit natural*

resources, build social, economic and political organizations, and carry forward national development.

In a sample of 24 PDAMs in West Java in 1997, monthly payment for approximately 5,600 workers was Rp 2.6 billion. This figure gives an average annual wage of one PDAM staff in West Java, in 1997, as Rp 5,5 million or equivalent to US$ 2,400 (Firman, 1998:239). A 13 % increase in the labour cost account in 1998 after the economic turmoil has slightly increased the average annual wage of PDAM staff in West Java. In Rupiah, the increase was from Rp. 5.5 million to Rp 6,3 million, but in terms of US$ this new wage was just equivalent to US$ 897[19] (1 US$ = Rp 7,000, spot rate, The World Bank, 1999) or dropped to almost one third of their previous wage in 1997.

One may find that it is unfair to justify the wage of PDAMs staff in US$, but, the fact that the market automatically justifies most of its prices in US$ has weakened the purchasing power of PDAMs staff. It is not just that the prices of imported goods has inflated, but also domestic food prices. Look at how inflation picked up rapidly from 5% in July 1997 to 120% in September 1998, while the general Consumer Price Index increase from 5% to 85% (The World Bank, March 1999:3).

Comparison between PDAM's Wage and Others Working in the Water Sector

In the provision of water, PDAMs contract the private sector to provide technical assistance, such as to prepare water supply master plan, detailed engineering design, financial and economic analysis. Specific physical work which requires huge resources, may be contracted to the private sector. These contracts involve significant amounts of money, for example, remuneration of consultancy

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[19] The exchange rate of I US$ = Rp 2,400 in July 1997 depreciated to Rp 15,000 in January 1998 (Firman, 1998:239). At the end of 1998, Rupiah was strengthened to a more stable position Rp 7,000 – 8,000 (The World Bank, March 1999).

work. Table 5-2 outlines the 1998 remuneration reference rates for international bids invitations for Indonesian consultants, and Indonesian expatriates (the joint decree between National Development Planning Agency (Bappenas) and Ministry of Finance). The monthly remuneration for a national consultant with 3 years professional experience in the related sector is US$ 733/ month and for twenty years experience, US$ 2,150.

Table 5-2: Reference Remuneration Rates for International Bid Invitation for Indonesian and Foreign Experts and salary of PDAMs' staff, Based on Relevant Professional Experience, 1998.

(1 US$ = approx. Rp 6,000)

Proffessional Experience (years)	PDAM's staff (US $/ year)	National (US $/ month)	Inter-National (US $/ month)	Proffessional Experience (years)	PDAM's staff (US $/ year)	National (US $/ month)	Inter-National (US $/ month)
3	319	733	4100	15	500		14700
4	349	917	4600	16	530	1850	15300
5	349	850	5100	17	530	1950	15400
6	380		5500	18	561		16400
7	380		6000	19	561		16900
8	410	1183	6400	20	591	2150	17400
9	410	1250	6800	21	591		17500
10	440		7200	22	621		17600
11	440		9700	23	621		17700
12	470	1500	12800	24	651		17900
13	470	1583	13400	25	651		18000
14	500		14100				

Source: Table 1: Bappenas, Billing Rate, 1998, Number : 604/D.VI/02/1998

A comparison of foreign experts with four years experience in the respective sector are entitled to US$ 4,600, while one who has twenty years experience is entitled to US$ 17,400 or approximately four fold the remuneration of professional consultants who have four years of experience. If we compare this with the remuneration of a national consultant who has four years experience (US$ 917), the amount she/he earns would be equivalent to approximately one quarter of an expatriate who has the same amount of experience and similar

qualifications. For 20 years experience, a national consultant earns 12% of remuneration of an expatriate.

If we compare the remuneration of consultants who have four years professional experience (US$ 917) to the basic salary[20] of PDAM's staff, who have the same qualification[21], the ratio is very significant: the ratio is 31 times the basic salary of PDAMs staff. The remuneration is equal to 12 times the average monthly wage of PDAMs' staff in West Java. When the experience of the national consultant is twenty years, the gap is wider; 44 times the PDAMs' staff basic wage. Is it fair to compare the remuneration of an expatriate who has twenty years experience? It may not be relevant, but at 240 times, this is incredible (Box 5.2).

Box 5.2 :

East Timor Water Supply and Sanitation Project, 1992 - 1998

East Timor Water Supply and Sanitation Project (ETWSSP), which commenced in early 1992 and completed in 1998 was funded by both the Government of Indonesia (GOI) and the Government of Australia (GOA). The total project cost was Aus$ 18,355,000 where GOA granted Aus$ 12,453,000 and GOI contributed Aus$ 5,902,000. The biggest allocation of GOA funding was for personnel (Aus$ 8,204,000); this is almost 65% of the GOA contribution. From the personnel cost, 269 months were allocated for Australian personnel (p39) and 2,261 months were allocated for Indonesian personnel. Estimated personnel cost for Australian personnel is 5,000,000 or almost 65% of the project.

This project aimed at improving water supply in two districts and also to increase the service coverage. The project has a wide range of roles, such as project management, technical advice, procurement, supervisory, capacity building and institutional strengthening. In order to meet these objectives, the project employed three full time expatriates besides other short-term advisors, and almost 60 local staff.

[20] The data is taken from 1997, due to unavailability of data for 1998, therefore the ratio should be seen with care.

The project management is divided into professional long-term and foreign staff, professional long-term and short term local staff, and locally engaged (supporting) staff. On the other side is the PDAMs staff. Perhaps, one of the interesting things about this project is the ratio of staff remuneration. The ratio of monthly remuneration of foreign inputs : local professional staff : technical officers : PDAM salary during the project (ETWSS PID, November,1993) was approximately (in Australian Dollar, 1Aus$ = Rp 1,400) = (16,000-17,800) : 2,900 : 520: and 110.

This project demonstrated how big the gap was between PDAMs staff salary and those who worked for the private sector, as well as, between the local professional personnel and the expatriates. Moreover, some proportion of foreign aid, regardless whether grant or loan, will be significantly beneficial for the economy of the donor countries, i.e; personnel cost, international procurements as well as experience.

If the local professionals have the capacity to deliver a similar service, the project cost may be much more beneficial to the local economy and the intended beneficiaries.

Further questions concerning the income inequality between PDAMs' staff, national consultants and expatriates working in the water supply sector in Indonesia are:

- Are there any indications of labour exploitation?
- Are PDAMs' staff in a bargaining position to demand a wage increase?
- Is the income inequality between these three professions justifiable in terms of their productivity?

The wages of PDAM staff are controlled by the government through MoHA (Box 5.3) PDAMs have very little bargaining power over an increase in their salary. Consequently, when the salary is no longer sufficient to cover even their basic needs, they cannot do much, although their position as the provider of basic needs is very strategic.

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[21] Bachelor Degree of university graduate.

Box 5.3:

The Minister of Home Affairs , Regulation No. 1, 1997 concerning "PDAM Staff".

To be eligible to become a PDAM staff member, PDAM staff have to meet nine criteria, such as nationality, age between 18 – 40 years, hold no police record, do not hold beliefs against the national ideology, be educated, have the needed skills, be healthy, and other criteria as specified by the director (Permendari No 1, 1997, article 3.1). After six to twelve months probation, the candidate should be able to demonstrate they meet the following criteria; faithful, strong working performance, cooperation, loyalty, honesty, responsibility, and initiative (ibid, article 3.3). PDAM is categorized into sixteen ranks (category A to D, where each category constitutes four classes). The ranking is mainly based on their educational background.

Based on the regulations, staff who graduate from primary school are ranked as Category A, elementary school; A/2, senior high shool; B/1 and bachelor; C/1. These ranks consequently determine their wages. According to the regulations, category A/1 will earn a basic salary of Rp 78,000; B/1 (110,100), C/1 (150,200) and D/1 (268,600). Other incomes may be based on the marital status of the staff, for example, spouse support is 10% of the basic salary and each dependent has a right to 5% support, with a maximum of two dependents (article 22). Other criteria, such as position, expertise, housing, transportation, and medical status are also allocated by PDAM, but amounts are unspecified (article 28.2).

These figures show that educational background is the biggest factor determining the wide gap between one staff and another. This is not the case between PDAM staff and the PDAM's consultant. The same qualification and experience result in two positions have very wide difference of income. This makes graduate university students, particularly, as those who have better bargaining power to become PDAMs' staff. For example, only 100 municipal engineers work for PDAMs throughout Indonesia; as compared to approximately 2,000 municipal engineers who have graduated from Bandung Institute of Technology (The World Bank,1998 ; Herijanto,1998). They tend to work in other sectors which provide an attractive salary, such as consultant firms, the banking sector and industries. PDAM is not seen as an attractive place to work. The sole reason being the inadequate salary.

As Todaro points out, It is not just about how to put more people into the wagons of employment, but, moreover, provision of adequate payment for the labour (Todaro, 1994:363). A large populated country like Indonesia, which is unable to utilize the skills of its people effectively for the nation's best developmental interests will strive in vain to succeed. Education imparts values, ideas, attitudes and aspirations, but needs fair compensation. If only government could provide

an attractive remuneration for national consultants and other sectors: PDAM can only dream of this reality. Perpamsi who recognize the problem of human resources in PDAM has no influence over the wage of PDAMs, nor that of the staff (Perpamsi, 1998). They may be only 0.229% of 15.7 million urban workers[22], but their role in providing service to 40% of the urban areas is incredibly important.

The only hope for PDAM staff to earn considerable income is by a mechanism where government allows PDAMs to distribute a certain proportion of their profit to the staff (Permendagri No1, 1997:article 35). However it is very difficult for PDAMs to make a profit. The accounting system states that the profit is the net balance between revenue and costs (operation, maintenance and depreciation cost). When the net balance is positive, then, PDAM claims a profit. Otherwise, the next most probable way is through optimizing operation and maintenance (O&M) costs. But these two options are almost impossible. Instead, PDAMs are not provided with sufficient costs to cover O&M. The most plausible option is to review the water tariff. This following sub-chapter will focus on this issue.

5. 3 Water Tariff as a Way to Increase PDAMs Staff's Welfare

In the provision of clean water to the public, PDAMs carry out two functions (Irmendagri No.8, 1998) :

- Economic function and,
- Social function

In the economic function, the government demands that PDAMs will be free from financial dependency and able to make profits, whereas the social function includes the marginalized society in the service scheme. Therefore, PDAMs have to conduct their missions in a very careful manner, being careful not to function

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[22] The staff working for the manufacturing industry in urban areas in Indonesia is about 10 – 20% of the country's labour force (BPS, 1998).

as a profit center for local government. In determining the tariff, PDAMs must comply with four main principles:

- Cost Recovery
- Affordability and Cross Subsidy
- Efficiency
- Simplicity and Transparency

Cost recovery means that the PDAM's income must meet all expenditures including the depreciation costs of fixed assets and are able to make a profit to enable PDAMs to expand their service. Affordability is a complex issue. In the water sector, 'affordable' may be defined as the total expenditure of water bill is equal to a maximum of 4% (four %) of average households incomes of the categorized consumers (Ibid). In case of the average household income being insufficient to meet basic needs (60 liter per capita per day, or, 10 m3 per household), PDAMs introduce a cross subsidy mechanism in their tariff accounting. PDAMs can alter the cost of water to the consumers using volume of water above basic needs.

Now, a problem is encountered, how to define who is the poor or the 'marginalised society' or the consumers who cannot afford to cover the cost for using water for basic needs. Most consumers monthly use ranges from 22.70 m^3 to 21.41 m^3 or almost 2.5 fold their basic needs. On the other hand, there is evidence where the poor are marginalised from the accessibility to clean water, like it or dislike it, they have to pay a very significant proportion of their income to buy water from street vendors. When they have to meet this challenge i.e. their only option, their willingness to pay may reach 5 times their affordability.

Poor societies are visible, but often unattended by PDAMs, only because they live in slum areas where the status of the settlement is under dispute. To serve the marginalized society often creates problems. They have financial constraints

making them unable to pay for new connection fees. They often make overdue payments or do not pay their water bill, but their water use exceeds basic needs (10 m3/month/connection). As the basis for PDAMs to determine affordability of consumers is the volume of water used, this exercise, in reality, is difficult to police.

5. 4 Unaccounted For Water (UFW)

UFW is a problem which is related to a lack of supervision, inadequate maintenance, capability of human resources, and participation. Thus, to handle this must involve integrated improvement on all four of these issues. What is happening now is slightly different. The government tries to tackle the problem by convincing the PDAMs to assign a new debt. It appears that central government tries to simplify the problem by reducing physical loss. In some instances, this is acceptable, but this is just one of the above four mentioned issues.

In the current situation, no one would warrant a gradual reduced level of UFW after replacing pipes or water meters. It could even be worse because the quality of supervision has not yet improved. An improved quality of supervision is a pre-condition before PDAMs try to handle UFW. Remember, the contractor, who naturally tends to meet the completion date of the job, is supervised by PDAM staff who are underpaid. How can you expect the supervisor to meet the work specification, if she/he is not provided with insufficient wages to meet her/his basic need? How can PDAMs assign some one to supervise the work is he/she is not provided with adequate skills or training? How can you expect consumers to participate if they frequently experience interrupted services? Perhaps the following findings are relevant to cases related to UFW:

- Some PDAMs staff who are in the middle of the work, cannot obtain the necessary spare parts from PDAM in the time needed to complete the work.

- During an interview with the head of planning division PDAM Kabupaten Bandung (August,1999), it was found that the PDAM has problems not just in planning but also in establishing an inventory of their system. The head of the planning division blamed the problem on the unavailability of capable human resources to carry out the task.
- There are many evidences that PDAMs staff are incapable to do simple hydraulic calculations. Insufficient skilled personnel directly impact on the level of UFW, for example, the choice of pressure rating for pipes can cause burst pipes. PDAMs tend to use low pressure pipes, because they are cheaper, most of the pipes joints are done using substandard practices.
- There are many PDAMs operators who do not have the necessary skills to operate treatment plants. Water quality is often unacceptable in accordance to set standards. For example, turbid water and debris may block the water meters. 'Aggressive' water may damage iron pipes in the long run.

Interestingly, central government believes that the answer is just as simple as assigning debt, procuring material and repairing or replacing pipes. Yet, there has been very little attention paid to the areas of building capacity, underpaid staff, supervision and attracting participation. These are the elements needed to achieve an acceptable standard of work. Planning, design, control and supervision are basic and essential daily tasks that PDAMs should be capable.

5. 5 Professionalism

It is a fact that insufficient numbers of qualified staff in PDAMs causes problems in the process of delegating authority and management. Most PDAMs run on a central mandatory approach from the directors. PDAMs also receive direction from three 'commanders', (1) Mayor or Head of Districts, (2) MPW and (3) MoHA. The fact that PDAMs have too many commanders has resulted in PDAMs loosing their own initiatives.

In administration, PDAMs pose problems. Many contracts with third parties were pursued not in accordance with government guidelines nor regulations. Many tenders are just official occasions, in reality, the winner has already been indicated by the management. Professionalism and transparency are two main issues which are non-existent within PDAMs. Many staff do not know their job description, obligations or rights.

Administrative procedures are complex and inefficient simply because staff have not been given adequate training. They do not have the ability to analyze the impact of inefficient procedures. Let us examine one problem related to the procedure applying to new connections (which was encountered during a field visit to PDAM Kabupaten Bandung) the forms require 17 signatures in the whole process. PDAM Palembang requires 20 signatures. Imagine how long it takes to circulate one application form for 17 different staff.

Moreover, if one PDAM needs to expand its service to about 1,000 new consumers, there will be 17,000 signatures required. It seems ridiculous, but true. Now questions emerge, is it something to do with trust, or does the principle of administration requires it so? In fact no, the process can be simplified and the number of signatures can be streamlined without causing possible confusion.

Communication within staff divisions is often poor. These examples are often found in the field, and create frustration amongst the field staff. PDAMs need to reform their management style, from a heavily centralized decision making process to a more professional one, delegating authority, providing minimum stocks of material for urgent action and other types of flexibility which will enable the service to pose minimal interruption to the consumers. Professionalism through rationalization of professional staff, capacity building, structured training, improving administrative procedures are constructive ways toward a professional enterprise.

In the carrier development the appointment of directors, promotion of heads of divisions, heads of sections needs transparency. In the era of professionalism, working performance is one way to judge promotion of all staff including the directors. Moreover, rewarding staff for their performance on an accountable basis for carrier development will minimize problems of family systems, connections, unfair judgment and problems related to transparency.

5. 6 The Challenge of Advanced Technology

The revolution of communication technology makes this world become smaller. It only requires minutes to report what is happening in a remote area. Communication technology has the ability to predict what is going to happen in the near future. This communication technology does not just dominate the telecommunication sector but also the water supply sector. The use of this advanced technology, in the provision of clean water has shifted the intensive labour to intensive capital. The demands of this have now become a reality. Large PDAMs, such as Jakarta, Bali and others are now operating local area networks in order to centralize management. Small PDAMs are now depending on computers for bill preparation. In pumping stations, new technology for remote operation has now been introduced.

Reading water meters is now being introduced by PDAM Kabupaten Bandung at consumers houses by using computer technology for onsite data input. PDAM Surabaya uses computer technology to measure the flow of water in pipes to investigate UFW. This equipment requires frequent calibration which is unavailable locally. Imported advanced technology equipment is very costly but the UFW in PDAM Surabaya remains high.

Overall, the revolution by information technology does not just cover up human deficiencies (Marcel, 1995), but is threatening the unskilled labour. Questions arising from the advance technology domination are:

- Who really benefits from the use of advanced technology?
- Will the unskilled local labour market benefit from the introduction of advanced technology, or will it only benefit developed countries who own and sell the technology?

Many managers who have seen or experienced the advantages of advanced technology in other places have been hypnotized by their success. Frequently, she/he denies the fact that there are several pre-conditions before such technology becomes conducive and beneficial for the enterprise. One pre-condition is to prepare skilled human resources, proper training programs for related supporting staff, and to assess local sources in order to minimize dependency upon external sources. Managers need to assess the 'pros' and 'cons' of the advance technology before adapting a certain product. The failure that many PDAMs are experiencing is not improved by simply introducing more advanced technology, but the ability of the managers to find the root of the problems, which is the lack of skilled human resource, poor supervision, and a heavily central government interfere.

5. 7 Incorporating Supervision in Organizational Structure

When BPAM (the embryo of PDAM) was established, the organizational structure of BPAM was made quite simple (Fig. 5-2). It consists of a Board of Directors (Head of PDAM, Head of Financial and Administration, Head of Technical Division), four sections under the financial & Administration division and four sections under the technical division. Each of these sections are headed by a head of section. This is the basic structure.

When the number of consumers increase to about 100,000, this is the time when the structure should reorganize. One of the most important positions is internal supervision. The objective is to provide a day to day basis of supervision within the organization, including technical, administration, financial and management.

This position is not so popular amongst other staff, including the supervisor, simply because they supervise someone else's job, such as, is the process of procurement in accordance with the regulation. Supervisors have to do it in a wise and very 'prudent' way, and try not to upset colleagues.

Theoretically, the position of supervisors is ideal, but not in practice. The work environment is not conducive to the existence of an internal supervisor in order to carry out internal controls. Proposed reforms are:

1. Introducing external control (supervisors)
This external control will be aimed at providing a day to day basis supervision and control and advice on procedures in accordance with regulations.

2. To establish Water Consumers Organization (WCO)
The existence of a Water Consumers Organization (WCO) will empower consumers in controlling the operation of PDAM. This will alter the bargaining position of consumers against PDAM.

Perhaps the private sector is much more suitable to fulfill the role of supervision and control of PDAM. Two professional supervisors are sufficient, one for technical matters and another for finance and administration. The supervisors should be responsible not to the director of PDAM, but to WCO (refer Figure 5-3 as a proposed revision of Figure 5-2). This will allow consumers to have access and power in order to take accountable measures for any mistakes committed by PDAM.

To enable the effective operation of supervision, the WCO will require a regular budget. One way to do this is by incorporating a fixed charge from each water bill which will be allocated to finance the operation of supervision and the WCO. In case PDAMs have insufficient connections to cover the entire cost of professional supervisory support, the assignment may be rationalized to just, say, a week in each month. Large PDAMs may provide cross subsidy to smaller PDAMs to enable them to finance professional supervisors. Finally, the beneficiaries of the supervisory role and the existence of the WCO are both PDAMs and the people.

Figure 5-2: Basic Organizational Structure of PDAMs

Alternative Type B (2,500 – 5,000 connections)

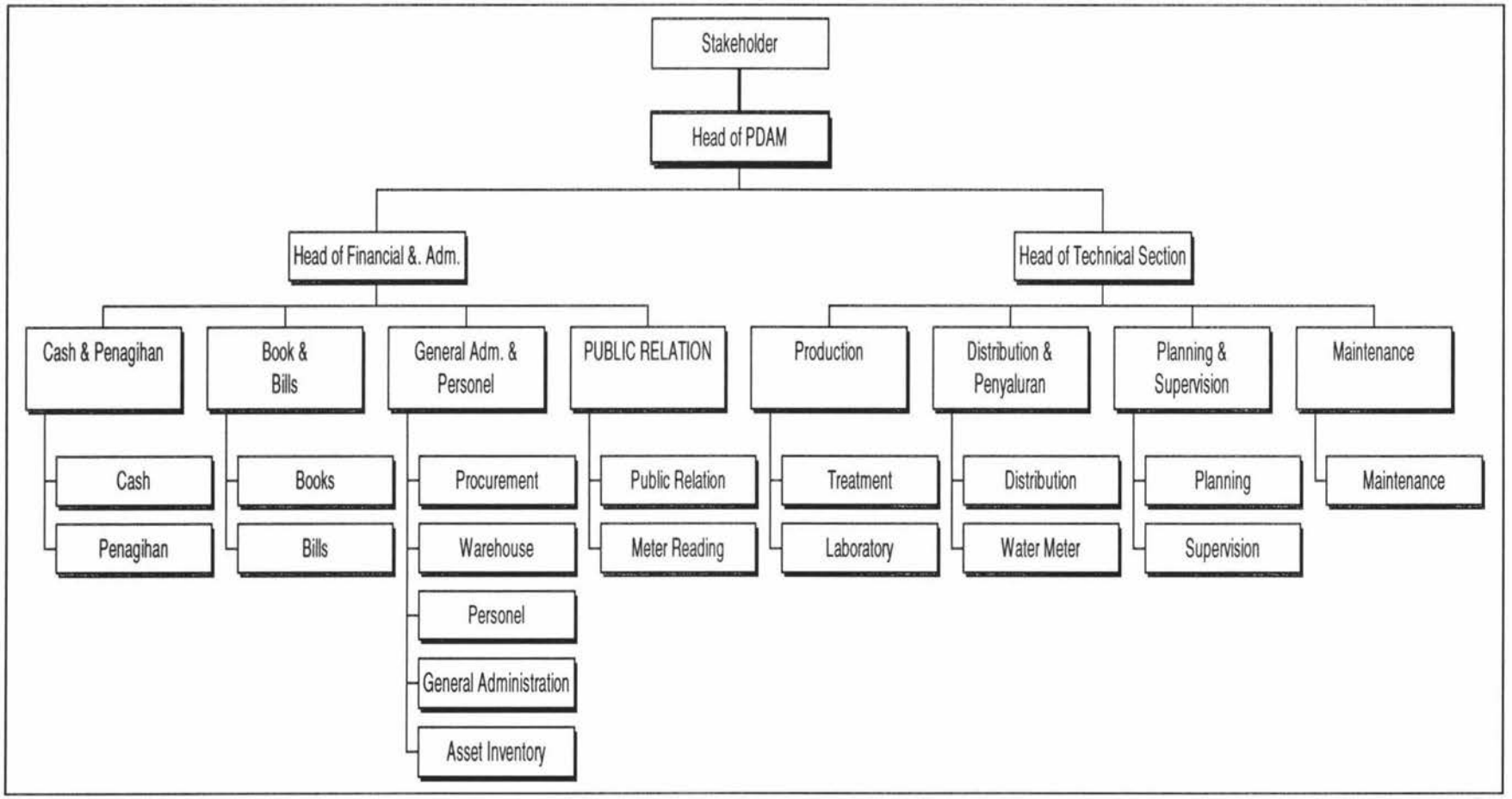
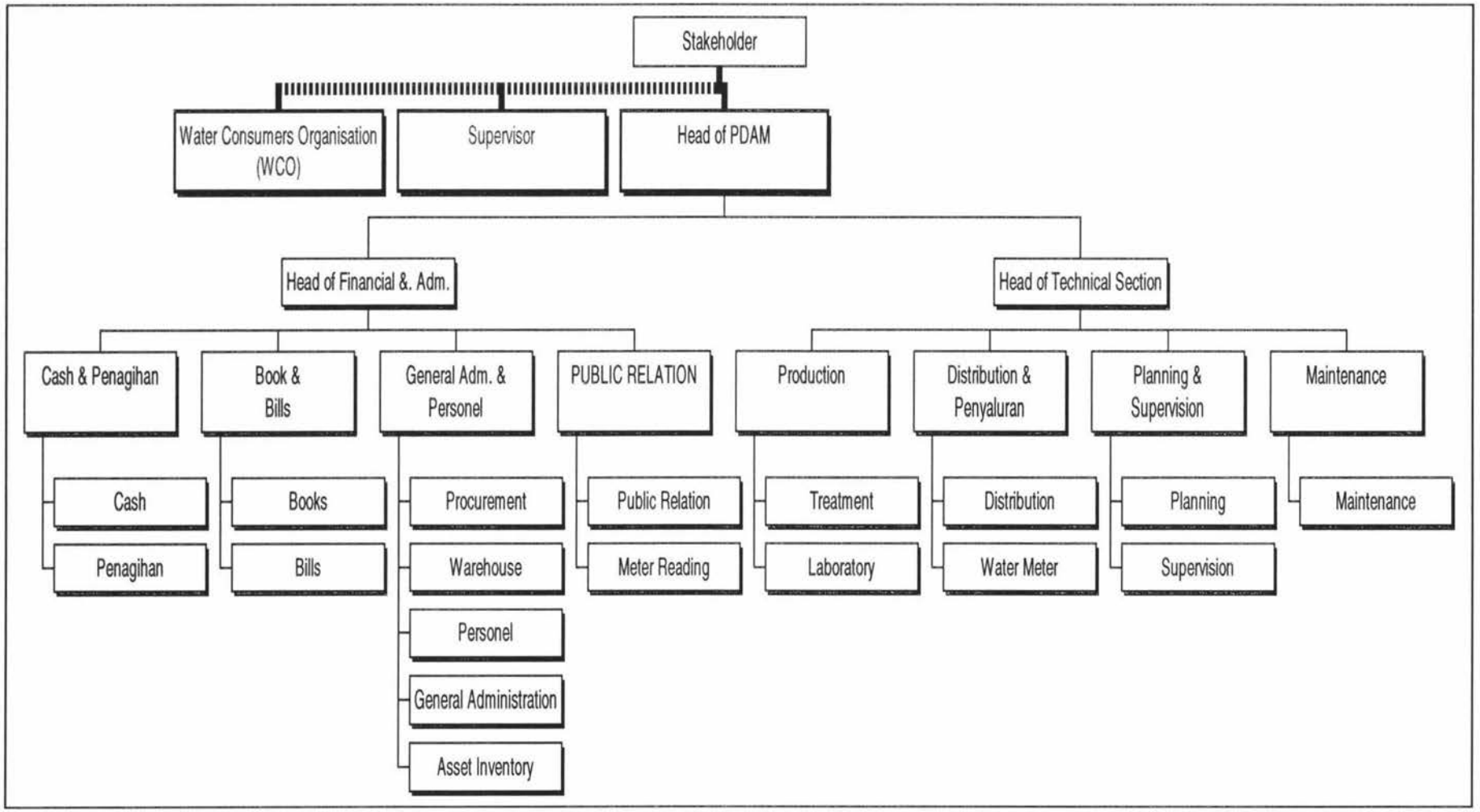


Figure 5-3: Proposed Organizational Structure of PDAMs

Alternative Type B (2,500 – 5,000 connections)



5. 8 Environmental Issues of PDAMs

Environmental problems have been imposed on marginalised people for years, it is not a new story. What is new, according to Boumol and Blinder (1991) is the awareness of people concerning the environment. They add, that in 1911, the conventional economic approach did very little to raise awareness about environmental issues. But day after day we can see that the environmental destruction, such as deforestation, for the sake of so called 'industrialization', and also high population growth, has been confronting countries with severe negative impacts. Let us examine the impact of the above issues on water supply.

In the past, home industries and big scale industries tended to locate their industries close to river-banks, or to a location which has better accessibility to water. Therefore, the choice is in catchment areas. This is also to allow industries to discharge their untreated wastewater back to the river. River banks are also seen as a good location for establishing non-permanent types of human settlements, thus untreated human waste is also discharged directly into the river. As the population grows, economy grows, urbanization rates increase, these all contribute to the increase of pollutants. The river is not just contaminated, but, is degrading to a septic category. PDAMs, where 65 % (Table 5-3) of their sources rely on raw surface water (e.g. river, lake), are now having to spend a lot more to treat the water.

Table 5-3: PDAMs Raw Water Source & Production Capacity

Coordinating area	Total Production	Spring Captation	Ground Water	River	Lake
1	15,084	3,127	874	10109	974
2	46,583	10,408	6187	29793	195
3	5173	51	200	4283	639
4	5163	977	705	3466	15
5	7837	3119	2159	2543	16
TOTAL	79,840	17,682	10125	50194	1839

Source: Direktori Perpamsi, 1998:363, : Table 3

'Bright Light' cities, such as Jakarta, Surabaya, Semarang, Yogya and Denpasar are relevant examples of degraded rivers, where quality is now at an alarming level. PDAM DKI Jakarta for example, relies on almost 100% of its raw water resources from surface water. The increase of human settlement, as a direct impact of imbalanced development, has left Jakarta with limited green space, it is a concrete forest. The quality of this surface water is severely polluted by domestic and industrial waste. Deforestation in the upstream area, where Jakarta relies most on the water catchment areas, such as, Bogor, Puncak and Cianjur, does not just decrease the volume of raw water, but increases the level of Solid Particulate Material (SPM) in the water. This has increased the costs for treatment of the water, for example, the World Bank reported that the level of SPM and lead in Jakarta imposes health costs totaling US$100 to US$455 million (Hammer and Shetty, 1995:5). Unsafe water in Jakarta imposes annual costs of more than $300 million solely from additional deaths from diarrhea, costs that are borne almost entirely by the poor (Ibid:4).

Why is the environment is not properly handled?

Firstly, people do not have personal responsibility for environmental protection. For example, discharging untreated wastewater is free, as long as this action will not directly impose on others. For example, BOD, the main indicator of pollution level, shows that Jakarta Bay in 1989, during wet season was ranging between 50%–400% above standard, and in the dry season was 100%–600% (Haryoguritno, 1999:4). The second is regulations; Indonesia has very good records on releasing new regulations, as well as the records to break the same regulations. Both the state and the people put very little effort into enforcing their environmental policies.

AusAID finds that this phenomena is not solely dominated by Indonesia, this is a matter of lack of political willpower which many countries are experiencing (AusAID, 1996). The contribution of developed countries in abusing the environment is also quite obvious, for example, relocating industries to less

developed countries where waste generates pollution, massive use of fuel (Trainer,1989) and exporting waste and toxic waste to less developed countries. There are always ways of getting rid of the consequences for polluting the environment. But in the end, when resources begin to show physical signs of abuse, economic and ecological consequences are usually not far behind (Postel 1984:18).

PDAMs are no exception in the abuse of the environment. Every day, 5%–10% of water from surface water treatment is required to backwash the water filters and other related unit of treatments. The wastewater from the backwash process is extremely polluted. Surprisingly, not one PDAM has ensured proper handling of the sludge, particulate or other pollutant discharge from the treatment plant to the receiving body. PDAMs do not have any obligation to treat their wastewater before discharging it to the river. PDAMs who inherit prosperity from nature, in return, instead of preserving the environment, contribute in eroding it.

In this context, one question emerges, are PDAMs categorized as polluters? Yes, it is true and indisputable. Therefore, PDAMs should participate in environmental preservation. There are several ways to do this. Firstly, water should be seen as a scarce good. Therefore, every element which may contribute to the conservation of water should be part of PDAMs' contribution. PDAMs should value the water not just based on the value of putting water captation, pumping and treating, distributing and managing the enterprise, but the cost of conserving water. This is about internalizing externalities, which is cost for conserving water, thus, conserving environment. Off course, PDAMs are not solely responsible for this, only partially. As a consequence, PDAM should incorporate the value of producing water and cost to treat the wastewater and cost for conserving environment, particularly the water catchment areas.

PDAMs have no control over these activities. It involves multi-sector approaches, such as departments which deal with industry, local government, forestry,

agriculture, transportation and environmental agencys. It is not just limited to how to release new policies, but how to enforce people, by law, to implement the supremacy of environmental laws. If PDAMs want to reform their approach toward a more sustainable water supply, their involvement and full support for environmental preservation is a must. Their obligation is to actively participate in promoting environmental issues. One way to do this is to internalize the costs related to environmental preservation. In practice, PDAMs will charge water consumers for the use of water for water conservation. PDAMs will consequently have to treat the wastewater discharged from the treatment plant. Bear in mind that these are very costly, internalizing costs for preserving or conserving the environment will consequently raise the water tariff.

5. 9 Private Sector Participation

Private sector participation (PSP) in Western countries is not a new story. For example, PSP in providing services to telecommunication, power and other infrastructural sectors. Nevertheless, in the water supply sector it maybe considerably new. The United Kingdom, for example, began to discuss PSP in the water sector on April 1, 1985, when Minister of Housing and Construction, Ian Gow MP, circulated to the chairmen of all regional water authority a discussion paper on possibilities for privatization (Terry, 1985 in PFF). Terry (Ibid:1) marked the paper as a significant step in the government's policy towards increased PSP in the provision of water services in the United Kingdom water sector.

In the debate, the participants presumed that privatization simultaneously benefits enterprises, customers and employees concerns. Privatization, as they point out, is seen as a way of (Ibid, 67):

- Freeing enterprises from state control so that decisions are taken for sound business reasons.
- Increasing efficiency, enterprise and competition.

- Involving employees in the ownership and success of the companies in which they work.
- Reducing the size of the public sector.
- Spreading ownership more widely.

There are several constraints posed by the public sector in managing public services as pointed out by The World Bank (The World Bank in Herijanto, 1998:9):

- The fact that the public sector is experiencing difficulties in allocating the available and limited budget to extend its ambitious programs to extend its service.
- There is only very little improvement of services made under the heavily managed public sector, it is expected that PSP may have a more efficient way of allocating the required resources.
- Under public sector management, the price of water was considerably low, One of the reasons for keeping the price unrealistically low was that public service is perceived as a political tool for government. Failure to maintain a low tariff may influence the popularity of the current government.
- It is typical that public sector management have a lack of transparency in divulging information meaning that the consumers have to know the value of their expense.
- The dependence of PDAMs on government annual budget program often means that urgent work cannot be executed in the time needed. Not just in budgeting, but many decisions require decision from central and local government, as well as the technical department.

Involving PSP in the development of the water sector may be classified into six main categories: (1) service contract, (2) management contract, (3) lease, (4) concession, (5) BTO/BOO, and (6) divestiture. According to table 5-4), the full

level of participation (privatization[23]) may be done through the transfer of ownership or divestiture (UNDP, 1991; Herijanto,1988).

Table 5-4: Allocation of Key Responsibilities under the Main PSP Options

Option	Asset Ownership	Operation & Maintenance	Capital Investment	Commercial Risk	Duration
Service Contract	Public	Private	Public	Public	1-2 years
Management Contract	Public	Private	Public	Public	3-5 years
Lease	Public	Private		Shared	8-15 years
Concession	Public	Private	Private	Private	25-30 years
BOT/BOO	Private & Public	Private	Private	Private	20-30 years
Divestiture	Private or Private & Public	Private	Private	Private	Indefinitely *

*may be limited by license
Source: Tool kits for PSP in Water and Sanitation, World Bank, 1997 in Herijanto, 1998:13 Table 2.1

Box 5.4:

PSP In The Water Sector In Indonesia

In the early 1990s, the water supply sector in Indonesia began to realize the need to invite PSP in a more extended role. MoHA permitted PDAMs to invite PSP as a joint venture with third parties (Permendagri No.4, 1990). Not until 1996, MoHA finally released an instruction as a guidance to invite PSP into the water sector (Moha, Irmendagri, No.2,April 1996). The guidelines limit private sector from divestiture, simply, because it is against the Indonesian constitution (Constitution No 33). Interestingly, the PSP had started before the guidelines were released. Some examples are highlighted here:

In 1991, PDAM Badung, Denpasar (Bali) approved a 20 year concession (effective from 1993) for a private company to provide water for certain areas, including tourism areas.

[23] Privatization is generally defined as transferring ownership from public to private sector (The World Bank, 1997).

The concession allows the private sector to undertake wider roles, such as treatment plant, distribution and management.

In 1994, PDAM Kabupaten Dati II Bekasi and Pt. Grahabuana Cikarang signed a 25 year BOT project, where PDAM is entitled to 5 % royalty. The scope of cooperations are to develop water treatment plants, distribution system expansion and management.

In April 1996, PDAM Tangerang signed a cooperation agreement with a national consortium, Tirta Cisedane, a limited liability company, consisting of Pt. Teknik Umum, Pt. Traya, Pt. Tirta Degreemont and Yayasan Kemusuk-Somenggalan. The cooperation involved the management of Cisedane-Serpong water production facility. This happened two months before the guidelines (Moha, Irmendagri, No.2,April 1996) were released.

In 1995, PDAM Serang established cooperation with a limited liability company, Pt.Sarana Catur Tirtakelola, which consisted of seven companies, including a military owned company, Pt. Asabri. Pt. Sarana Catur Tirta Kelola in association with Den Otter Management Services, BV undertook the BOT project for a 25 year concession. PDAM Serang is entitled to 15 % royalties plus Rp 250/ m3 water sold.

It seems that the initiative for the PSP in the water sector has been led by the private sector. Perhaps, there is also a doubt whether participation of the private sector will weaken the role of the current PDAM management in the decision making process. As pointed out by Herijanto (1998), most contracts were granted without any formal bidding procedure. Furthermore, the the private sector tends to deal with potential and specific potential markets, such as tourism and industrial areas. The influence of central government was quite substantial in the realization of PSP. The analysis of risk undertaken for the seven contracts, found that only 29 % of the total risks were specified in the whole contract (Ibid;64), and it was seen as the lack of experience and attention given by PDAMs and the government involved in the decision making process. Finally PSP in Indonesia was one way to invite foreign investment in the expansion of the water supply.

The correspondence received by the author from PDAMs (1999),shows that not one of them has set cooperation on the level stated in the 'service contract' with

the private sector. For example, in meter reading or connections, a few large PDAMs, such as Batam, Jakarta, Bekasi, Medan, Badung (Bali), have gone through a higher level of participation. For example, provision of clean water in Kuta and also tourism areas are under the management of the private sector. PDAM Badung does not allow its staff to provide connections for new consumers, only the private sector. One of the reasons being that PDAM will only concentrate on its mission, to provide service for existing consumers.

Water Meter Readings

Finally, the accuracy of meter readings often invites frequent complaints from the consumers. For example, meters are not read but are estimated based on the previous months consumption pattern. Experiences conclude that the human factor contributes a significant portion of these repeated mistakes. Yet, PDAMs have made very little effort in finding a solution to this problem. PDAM Kabupaten Bandung tends to provide the meter readers with advanced equipment but most parts are imported. There are very few PDAMs who have handed over the readings to the private sector as part of private sector participation.

Another possibility, in billing, is by consistently using average consumption rates which are 3 or 4 times subject to correction. This will minimize repeated mistakes, and at the same time, will simplify administration works. Commercial users category can be read on a monthly basis.

Summary

There are lessons that we learn from the tardiness of the water supply development in Indonesia. It consists of factors such as internal factors which are related to PDAMs themselves (human resources), government as the owner (salary, policies and centralised approaches) and external factors such as economic (affordability) and environmental issues. The following chapter presents the conclusions and recommendations of this thesis.

Chapter 6

CONSLUSIONS and RECOMMENDATIONS

The objective of the thesis was to examine the most influential factors behind the tardiness of water supply development in urban areas in Indonesia. Based on these influential factors, this thesis proposes several necessary re-orientations of the water supply development programmes in urban areas of Indonesia. Perhaps, it is important to highlight that the conclusions reached here should be adaptable to the case and current situation in Indonesia. Certain conclusions may have no generalising power if applied to different cultural settings and political climates.

These conclusions are drawn based on the available references, discussions with other colleagues and experiences of the author. There is also a need for the author to remind the readers about the difficulties in obtaining good quality information from the fieldwork. Two researchers may obtain different data, as well as interpreting them differently. These conclusions are based on the best available data of the time.

- **Influential Factors**

The influential factors behind the tardiness of the water supply development in Indonesia are drawn from the following conclusions:

1. High population growth and rapid urbanisation growth
2. Household income
3. Inadequate number of professional and skilled staff working for PDAMs
4. Lack of Supervision
5. Lack of competitiveness
6. Heavy centralised development approach based upon central government

High population growth & rapid urbanisation vs coverage

- **Conclusions**

High population growth and rapid urbanisation in Indonesia is part of global phenomena of Third World countries and cities. Most people accuse urbanisation as being the cause by creating imbalanced development. Both high population growth and urbanisation, in the case of Indonesia, creates many demands without directly contributing to prosperity. It obligates Indonesia spend a large amount of capital to cover the investment cost necessary for expanding public services to the people. In the case of PDAMs, just to maintain the similar current level of service (40 percent), an annual incremental provision of clean water requires approximately equivalent to 2.9–3.0 million people. At present, the incremental service provided by PDAMs in Indonesia, is approximately just enough to cover the total growth of people in urban areas. This is one of the reasons why the level of coverage is almost stagnant.

- **Recommendation**

As has been mentioned at the beginning of Chapter Six, Indonesia is experiencing rapid urbanisation growth. Moreover, the large population, with a considerably high level of growth, means that the annual incremental population is high. A more strategic way to increase the coverage of the water provision, is through these two ways:

- ❖ Indonesia should continuously promote the family planning programme.
- ❖ To promote balanced development throughout the country in order to encourage people to develop their own land.

- **Households Income vs Affordability**

Conclusions

The low salary of most households in urban areas makes it even more difficult for PDAMs to enter market based solutions. The findings suggest that without increasing the income of households, it is more likely that people will not be able

to afford to meet the normal consumption rates. Unfortunately, the improvement of peoples income depends not on the PDAMs but on the prospects of the Indonesian economy.

Recommendation

Beyond the control of PDAM is the issue of increasing income. What PDAMs can do is to optimise every single expense, which contributes in lowering the cost of water.

- **Inadequate numbers of professional / skilled staff working for PDAMs**

Conclusions

Professionalism promotes a high degree of efficiency, including efficient allocation of human resources. The fact that more than 90 percent of PDAM staff have qualifications equivalent to high school level, and the lack of professional and skilled staff, makes it difficult for PDAMs to develop their enterprises. PDAMs depend heavily on external assistance. In terms of salary, PDAMs are unattractive places for professional and skilled people to work, their situation promising an unclear future for most of their staff. Professional staff tend to be consultants to PDAMs because it is financially a lot more attractive.

In terms of capacity building, the role of consultant is essential. What has gone wrong in the past has been the interference by central government in capacity building programmes. Central government domination, and a centralised approach, has given the impression that capacity building is the project of central government staff. Consultants are engaged by central government to work for central government, not for PDAMs. The only training centre in Indonesia is located close to the capital, Jakarta. Consultants have been engaged by central government to work for central government instead of working for PDAMs. Consultants who work in the field for a limited time leave PDAMs staff without transferring the knowledge to help continue their projects.

Recommendations

This thesis recommends a complete review of the mission of PDAMs in their capacity, and responsibility, in providing clean water to Indonesian people. It should be stated very clearly that PDAMs, in carrying out its mission should be based on 'professionalism'. Professionalism consequently persuades PDAMs to enter an era of transparency, fairness, and accountability.

Human resource development should be given top priority for structured and planned capacity building. PDAMs should alter the minimum level of educational requirement to join PDAMs. A minimum of equivalent to a 3 year polytechnic graduate, is more likely suitable for PDAMs. Consequently, there should be no vacant positions for high school graduates at PDAMs.

In terms of capacity building programmes, it is recommended that central government engages advisory services (consultants) working with, and for, PDAMs on a day to day basis, an a long term basis. What is essential, is to empower PDAMs staff, to enable them to carry forward development. The success of PDAMs depends on the success of PDAMs in building up the capacity of the staff.

A prerequisite for PDAMs is to completely review the salary package of their staff, which will reflect the real need for a standard urban living cost. Failure to increase the salary of PDAMs staff will consequently prove fruitless in their efforts to reform PDAMs. It may be essential to reiterate the view of Professor Frederick Harbison of Princetown University (Todaro, 1994:363) :

> *Human resources constitute the ultimate basis for the wealth of nations. Capital and natural resources are passive factors of production; human beings are the active agents who accumulate capital, exploit natural resources, build social, economic and political organisations, and carry forward national development.*

- **Lack of Supervision**

Malpractice, such as corruption, collusion and nepotism have been affecting the daily role of PDAMs for a long time. This practice is widely spread, includes the bureaucracy and the private sector in Indonesia. Supervision no longer has power, resulting in hindering the performance of most PDAMs. Despite the fact that a supervisor has found that something has gone wrong in the field, the supervisor has very limited power to exercise his right to make a correction. This systematic malpractice causes inefficiency as seen in the performance indicators. Perhaps, the following items are the most influential factors behind the inefficiency of PDAMs;

1. Inadequate income of public officials to even meet the basic needs, on the other hand, private sectors earning a lot more than PDAMs' staff.
2. Law enforcement is not working.

Recommendations

Systematic malpractice, which has been widely spread over entire businesses in Indonesia, will never end without political will. On the other hand, public servants cannot survive living in urban areas without adequate income. Consequently, the government should pursue parallel actions:

- ❖ An increase in public servant salary should be followed by;
- ❖ Establishment of day-to-day supervision which will control the operation and management of PDAMs.
- ❖ Establishment of a water consumers' organisation for each PDAM.

The supervisors should not be government employees, but be recruited from the private sector, and also be responsible for the water consumers' organisation. Empowerment of water consumers will increase levels of control.

- **Appropriate vs Advanced Technology**

Appropriate technology in the context of development in Third World countries may be associated with the surplus labour supply. For example, the private sector tends to minimise labour inputs by using advanced technology, whereas public sector uses more labour intensive technology. Therefore, Indonesia needs to carefully plan the shift from appropriate to advanced technology.

In general, the low ratio between consumers and PDAMs staff indicates that PDAMs is still in the labour intensive approach. This approach still relies on appropriate forms of technology. These are the three issues that PDAMs will have to be aware of if they want to shift to advanced technology:

- ❖ Is this advanced technology produced locally?
- ❖ Have the staff the capacity to adopt the technology or will it creates another form of dependency?
- ❖ Is it affordable and/or appropriate to the task?

- **How environmental degradation impacts on the increased production of water**

High population growth, economic growth, industrialisation, poverty and imbalanced development, which cause rapid urbanisation, may contribute to increasing pressures on the environment. Many rivers, in big cities, are degrading in quality at an alarming level, polluted by untreated waste water discharged by both domestic and non-domestic customers. It increases the cost of clean water production, and makes clean water become a scarce commodity.

Unfortunately, PDAMs also contribute to this, and are categorised as polluters. The environment is not properly handled because people do not have responsibility for environmental destruction. Regulations promulgated to preserve

the environment are powerless because of a lack of political will to promote the application of environmental laws.

Recommendation

Participation by PDAMs in preserving the environment can be made by discharging waste water which meets effluent standards. Hence, PDAMs are obliged to treat their own waste, to participate in environmental preservation or conservation and to value water, not just the cost of production, but the cost of preserving the environment, at least in their catchment area. This is about internalising externalities. In the short term, the cost of water increases, but in the long term, this contributes to sustainable water supply.

- **Private Sector Participation**

Conclusions

PDAMs has been given privilege by the state to exist without competition. Only in the 1990s did the government then believe that private sector participation was necessary. In fact, the private sector has had little interest because most of the PDAMs are financially unattractive. Private sector participation (PSP), popular or not, will decrease PDAMs from state control so that decisions are taken for sound business reasons. This implicates the increase in staff welfare. There is a hope that PSP will increase efficiency and competition. PSP, beside reducing the size of public sector will spread responsibility more widely. As The World Bank argues, under public sector management, the price of water was comparably low. One of the reasons to keep the price unrealistically low was that public service is perceived as a political tool for government.

Recommendation

Realising that the performance of most PDAMs are not attractive for full privatisation or complete divestiture, it is recommended that government will start dismantling components of its business for PSP, for example;

- Contracting meter readings to private sector for a period of time based on free and fair bid competition. Small scale businesses or NGOs may be appropriate to do this.
- Handling over the operation and management of production units, such as water treatment plant and pumping station.
- Freeing administration from billing preparation and handling over to PSP.
- Installation of new connections is to be handed over to several PSP, to allow competition mechanism.
- UFW reduction program may be done by PSP, apart from a limited size of works.

Finally, it is important to highlight the issue of clean water provision from the future political stand points: the increasing tension from other territories to share control and power sharing is now leading to state disintegration in Indonesia. Provinces where human resources are weak and who lack natural resources, will certainly face problems in the future. Therefore, it is the time for PDAMs to prioritise the foundation of human resources, environmental approaches, community participation, and empowerment if they want to develop a role which is free from these effects and can more readily met the needs of present and future generations.

APPENDIX *A*

APPLICATION FOR APPROVAL OF PROPOSED RESEARCH PROCEDURES INVOLVING HUMAN SUBJECTS

MASSEY UNIVERSITY HUMAN ETHICS COMMITTEE

To : The Ethics Secretary
Human Ethics Committee
AVC's Office (Research)
Palmerston North Campus

OR
The Committee Secretary
Human Ethics Committee
Principal's Office
Albany Campus

APPLICATION FOR APPROVAL OF PROPOSED RESEARCH PROCEDURES INVOLVING HUMAN SUBJECTS

APPLICANT:

Name: Anor Sihombing
Department: Institute of Development Studies, School of Global Studies
Status : Masterate Student
Postal Address: Institute of Development Studies, Massey University,
Private Bag 11-222
Name of Employer:

PROJECT Title: Reorientation of the Clean Water Supply Services in Indonesia.
Research Project for Masters Thesis of Development Studies
Status : Masterate
Funding Source: NZODA & School of Global Studies GRF
Clinical Trial Status: yes ... No.....

ATTACHMENT

Information Sheet & Consent Form
List of Data collection
Letter from Perpamsi (The Indonesian Water Supply Association)
Research Proposal

SUPERVISOR

Name : Dr. Donovan Storey
Department: Institute of Development Studies

SIGNATURES

Applicant:

Supervisor:

Date :.....

OFFICE USE ONLY

Received Decision

PROJECT TITLE
"REORIENTATION OF THE CLEAN WATER SUPPLY SERVICES IN INDONESIA "

1 APPLICATION FORMAT

1.1 Justification

This research project proposes to investigate the current lack of clean water supply in the urban areas of Indonesia. This thesis will examine why provision is so low and how local water supply enterprises may reorient their strategies in order to meet increasing need.

The institution body working on the development of clean water supply in Indonesia is the Local Clean Water Supply Authority, called as PDAM (Perusahaan Daerah Air Minum). The association of PDAMs in Indonesia is called Perpamsi (Indonesian Water Supply Association, IWSA). These are the two institutions which have access to the clean water supply data in Indonesia.

Perpamsi collects the essential performance indicators of approximately 300 local water supply enterprises in Indonesia covering western, middle and eastern parts of Indonesia. This is one of the reason why the researcher must establish contact with Perpamsi.

A detailed survey conducted by myself of two selected PDAMs is seen as very important in order to obtain clear picture of the situation of PDAM financially and technically, i.e, how can they possibly increase the quantity, quality and continuity of the services.

Prof. Benny Chatib of Perpamsi has replied officially to my supervisor, indicating that I will have access to any data available at Perpamsi. (refer the enclosed letter).

1.2 Objective

The specific objective of this research is 'to determine the factors which can be reoriented in order to increase access by all social classes to meet their needs for a clean water supply in urban areas'.

1.3 Procedure for recruiting participants and obtaining Informed Consent

Three months before the fieldwork, the researcher has established contact with Perpamsi in Jakarta. Perpamsi has officially appointed an engineer as a contact person for this research project. (letter enclosed). Through Perpamsi, the researcher will ask for a reference letter giving permission to visit two local water authorities (PDAM). Both Perpamsi and the directors of PDAM will be informed of all aspects of this research project including an information sheet and a consent form that requires their signature.

1.4 Procedure in which research participants will be involved

The researcher will go through the Directors of PDAM and to ask him to recommend the best people from whom the required data should be obtained. This procedure may give no opportunity for the participants to say 'no', because the director's appointment means instruction rather than voluntary. This is a common practice in Indonesia, if the director agree his/her official must agree. It is unavoidable. For example, a reply letter from Perpamsi (refer: enclosure) has appointed a contact person from whom I will discuss or obtain the data. However the researcher will respect the recommended persons by inviting him to participate, make a full explanation about the research project including providing the information sheet and consent form requiring signature.

1.5 Procedures for handling information and material produced in the course of the research including raw data and final research report

The participants will be informed that the final report will be open for publication. At the beginning and at the end of the interview and data collection, the researcher will ask the participants if there is any confidential information that the researcher should protect from access by third parties. If so, this particular data will not be used.

2. ETHICAL CONCERNS

2.1 Access to Participants

I will visit their work place (Perpamsi & PDAM) to invite them to participate in this research project. Explanation of the information sheets and the consent form in detail will be arranged with the managers. The managers will probably appoint their officials to undertake the interview and to help organize data collections. I visit the officials and arrange a meeting with him/her to explain the research project including the information sheet and the consent form.

2.2 Informed Consent

I will explain in detail with the selected participants, the research project, and give them the information sheets and the consent form. The participants will be given the opportunity to exercise their right to say 'yes or no'.

2.3 Anonymity and Confidentiality

The researcher will respect the rights of participants to keep their identity anonymous and that only my supervisor at Massey University will have access to the anonymous source. The participants may request that certain information should remain confidential and this will be respected.

2.4 Potential Harm to Participants

Potential harm to participants is unforeseeable.

2.5 Potential Harm to Researcher

Potential harm to researcher is unforeseeable

2.6 Potential Harm to University
Potential harm to university is unforeseeable.

2.7 Participant's right to decline to take part
The researcher will inform the participants that they have their right to decline to take part or not to answer any particular question and/or to withdraw from the study at anytime. These rights are written in the information sheet.

2.8 Uses of Information
Audio tape recording and copies of data will be destroyed by the researcher after the completion of the research project. The summary of the research will be made available for Perpamsi (Indonesian Water Supply Association) upon request. Each of the Institute of Development studies and Massey Library will have one copy of the full thesis report.

2.9 Conflict of Interest/conflict of Roles
None

2.10 Other ethical concerns
None

APPENDIX *B*

INFORMATION SHEET & CONSENT FORM

(ENGLISH & INDONESIAN VERSION) PROJECT TITLE

"REORIENTATION OF THE CLEAN WATER SUPPLY SERVICES IN INDONESIA "

INFORMATION SHEET

The researcher
The research project is conducted by Anor Sihombing, a postgraduate student of the Institute of Development Studies, Massey University, New Zealand.

The purpose of the research
This research is done in order to fulfil one of the requirements for a Masters of Philosophy Degree in Development Studies.

Supervisor
In doing this research project, the researcher is under the supervision of Dr. Donovan Storey, Lecturer in the Institute of Development Studies, Massey University, New Zealand.

Research Topic
The topic of the research is ' clean water supply', the development of sub-sector clean water supply in urban areas of Indonesia in relation to the water supply enterprises.

Research Question
The research question is: ' What factors need to be reoriented in order to develop a clean water sub-sector to give better opportunity for the people in urban areas to meet their needs for clean water'?

Research Objective
My specific research objective is 'to determine the factors which can be reoriented in order to increase access to all social classes in order to meet their needs for a clean water supply in urban areas'.

Participation
You are invited to volunteer according to your own accessibility and preference of time. If you agree to participate, we will arrange a time and place for the interview which will last approximately one hour.

The interview will be tape recorded. If you have any objections to a recording device, you may decline its use it or suggest another preference. Taped information will be transcribed by the researcher, based on an agreement between yourself and the researcher. The transcription e.g tapes, papers, etc., will be destroyed at the conclusion of the thesis.

INFORMATION SHEET (*continuation*)

The rights of Participants

Participants have the right to read the information sheet and have the details of the study explained to them. Participants can decide not to answer any particular question and/or withdraw from the study at anytime. You have the right to ask any questions and receive satisfactory answers during the research process.

In case the political situation does not permit for open communication or touches sensitive issues, the researcher is willing to discuss alternative procedures in order to solve the problem.

Most of data belongs or relates to the PDAM rather than personal. It is most likely that there will be no personal data to be collected for this research. The research will respect the rights of participants to keep their identity anonymous and their information confidential.

If requested, the summary of the research will be sent to Perpamsi after the completion of the research project.

Finally, this research is being conducted in a way that ensures the rights of participants, the researcher and the university are protected under the principles of informed consent, truthfulness, and confidentiality, minimizing harm and social sensitivity.

In order to achieve effective contact or communication with the researcher and the supervisor, participants are encouraged to make use of email or facsimile or direct communication. There are two options available for contact :

Anor Sihombing (researcher)
Institute of Development Studies
School of Global Studies
Massey University
Private Bag 11-222
Palmerston North, New Zealand
Fax : 64-6-3505692
Email : A.sihombing@massey.ac.nz

Dr. Donovan Storey (Supervisor)
Institute of Development Studies
School of Global Studies
Massey University
Private Bag 11-222
Palmerston North, New Zealand
Fax : 64-6-3505692
Email:D.storey@massey.ac.nz

The researcher

Anor Sihombing

PROJECT TITLE
"REORIENTATION OF THE CLEAN WATER SUPPLY SERVICES IN INDONESIA "

CONSENT FORM

I have read the information Sheet and have had the details of the study explained to me. My questions have been answered to my satisfaction, and I understand that I may ask further questions at anytime.

I understand, I have the right to withdraw from the study at anytime and may decline to answer any particular questions.

I agree to provide information to the researcher on the understanding that my name will not be used without permission and the information will be used only for this research and publications arising from this research project.

I agree/do not agree to the interview being audio taped.

I also understand that I have the right to ask for the audio tape to be turned off at anytime during the interview.

I agree to participate in this research under the conditions set out in the information sheet.

Signed : _____

Name : _____

Date : _____

JUDUL PENELITIAN
"REFORMASI PELAYANAN PENYEDIAAN AIR BERSIH DI INDONESIA"

LEMBAR INFORMASI

Peneliti
Penelitian ini dilakukan oleh Anor Sihombing, mahasiswa strata dua, di Institute of Development Studies, School of Global Studies, Massey University, New Zealand.

Maksud penelitian
Penelitian ini dilakukan untuk memenuhi salah satu syarat untuk meraih gelar Masters of Philosophy degree bidang 'Studi Pembangunan'.

Pembimbing
Dalam melaksanakan tugas ini, peneliti akan dibimbing oleh Dr. Donovan Storey, dosen pada 'Institute of Development Studies', Massey University, New Zealand.

Topik Penelitian
Topik penelitian ini adalah 'Air Bersih', pembangunan sub-sektor pelayanan air bersih di daerah urban di Indonesia dalam kaitannya dengan PDAM /PAM.

Pertanyaan Utama
Pertanyaan utama dalam penelitian ini adalah: 'Faktor-faktor apa yang perlu untuk direorientasikan dalam pembangunan pelayanan air bersih agar dapat memberikan kesempatan yang sama pada semua lapisan masyarakat didaerah urban memenuhi kebutuhan air bersihnya'.

Tujuan Penelitian
Tujuan utama dari penelitian ini adalah ' Untuk menentukan faktor-faktor yang dapat direorientasikan untuk meningkatkan akses semua kelas sosial (lapisan masyarakat) memenuhi kebutuhan air di daerah urban'.

Partisipasi
Anda diundang untuk berpartisipasi secara sukarela sesuai dengan kemampuan dan kesempatan yang ada dan berdasarkan kebutuhan masing-masing. Jika anda setuju untuk berpartisipasi, kami akan menyediakan waktu untuk melakukan tanya-jawab yang mungkin memerlukan waktu satu jam.

Tanya-jawab akan direkam dengan alat perekam suara. Jika anda berkeberatan dengan alat perekam suara, anda dapat mengusulkan cara lain yang dipandang sesuai. Rekaman suara akan dibuat transkripnya, sesuai dengan kesepakatan peneliti dan anda. Transkripsi seperti, kaset, paper dsb. akan dimusnahkan oleh peneliti pada saat kesimpulan thesis telah dibuat.

LEMBAR INFORMASI (sambungan)

Hak-Hak Partisipan

Partisipan berhak untuk membaca lembar informasi dan detail studi yang diterangkan kepada mereka. Partisipan dapat memutuskan untuk tidak menjawab pertanyaan tertentu atau menarik diri dari partisipasinya setiap waktu.

Anda berhak untuk bertanya dan menerima jawaban yang memuaskan setiap waktu selama proses penelitian berlangsung.

Jika situasi politik tidak mengijinkan untuk dilakukan tanya-jawab atau dianggap sebagai issue yang sensitif, peneliti akan bersedia untuk mencari prosedur lain untuk mendiskusikan hal ini.

Kebanyakan dari data yang dikumpulkan adalah data PDAM atau yang berkaitan dengan PDAM, bukan data pribadi. Pengumpulan data pribadi tidak termasuk dalam penelitian ini. Peneliti akan menghormati hak-hak partisipan jika identitas atau informasi tersebut dianggap bersifat rahasia. Jika diminta, rangkuman akhir dari penelitian ini akan dikirimkan copynya ke Perpamsi setelah penelitian ini diselesaikan.

Akhirnya, penelitian ini dilakukan untuk menjamin bahwa hak-hak partisipan, peneliti dan universitas dijaga sesuai dengan prinsip yang telah disepakati, kebenaran, kerahasiaan dan meminimalkan cela dan sensitifitas sosial.

Untuk menjaga komunikasi yang effektif antara peneliti dan pembimbing, partisipan dapat mengirimkan email atau fax pada alamat berikut:

Anor Sihombing (researcher)
Institute of Development Studies
School of Global Studies
Massey University
Private Bag 11-222
Palmerston North, New Zealand
Fax : 64-6-3505692
Email : A.sihombing@massey.ac.nz

Dr. Donovan Storey (Supervisor)
Institute of Development Studies
School of Global Studies
Massey University
Private Bag 11-222
Palmerston North, New Zealand
Fax : 64-6-3505692
Email:D.storey@massey.ac.nz

The researcher

Anor Sihombing

JUDUL PENELITIAN
"REFORMASI PELAYANAN PENYEDIAAN AIR BERSIH DI INDONESIA"

LEMBAR PERSETUJUAN

Saya telah membaca lembar informasi dan detail penelitian yang dimaksudkan telah diterangkan kepada saya. Pertanyaan yang saya ajukan telah dijawab dengan memuaskan, dan pertanyaan lainnya mungkin akan saya sampaikan setiap waktu.

Saya mengerti, bahwa saya berhak untuk menarik diri sebagai partisipan dari studi ini setiap saat dan untuk tidak menjawab pertanyaan tertentu.

Saya setuju untuk menyediakan informasi kepada peneliti dengan pengertian bahwa nama saya tidak akan digunakan tanpa persetujuan dan informasi ini akan digunakan terbatas pada penelitian ini serta publikasinya.

Saya setuju / tidak setuju interview ini direkam dengan alat perekam suara.

Saya juga mengerti bahwa saya berhak untuk meminta agar alat perekam suara dimatikan selama interview jika saya perlukan.

Saya setuju untuk berpartisipasi dalam penelitian ini sesuai dengan kondisi yang dinyatakan dalam lembar informasi.

Tanda tangan : _____

Nama : _____

Tanggal : _____

APPENDIX *C*

LIST OF DATA COLLECTION & INDIVIDUAL INTERVIEW

A. DATA COLLECTION

A.1. PERPAMSI (Note: Beside collecting data, the researcher will ask for clarification if unclear).

- Role of Perpamsi on clean water supply sector in Indonesia
- Essential performance indicator for 300 water supply enterprises in Indonesian, such as; consumers, coverage, staff, UFW, water tariff & production cost.
- Master plan for water supply in Indonesia
- Tariff guidelines
- Catchment Area preservation, legal stand & law enforcement
- Environmental investment cost to preserve the catchment area
- Is water tariff include the cost of environmental preservation

Note: Beside collecting data, the researcher will ask for clarification if unclear.

A. 2. PDAM (Note: Beside collecting data, the researcher will ask for clarification if unclear).

A. 2.1 General Administration & Technical Dept.

- Institutional Strengthening
- Organisation structure
- Personnel's level of study
- Record of staff training
- Process of staff recruitment
- Catchment Area preservation, legal stand & law enforcement
- Environmental investment cost to preserve the catchment area
- Is water tariff include the cost of environmental preservation

Impact of Economic Crisis

- Production cost
- Water tariff
- Price list of pipes & fittings before and after economic crisis in INA.
- Rate of application for new consumers

A. 2.2 Public Relation Section

- Consumers record, last 10 years
- Water supply coverage
- Complaints record/year
- Rate of complaint settlements/year

A. 2.3 Treasury Section

- Efficiency of water bill collection
- Affordability (income statistics)

A. 2.4 Maintenance Section

- Level of UFW, recorded or not
- Management of UFW (task force / special unit)
- Capacity of the enterprise to reduce UFW/ year
- Law enforcement for intentional damages
- Meter repair facilities
- Rate of Meter repair
- Rate of meter replacement program

A. 2.5 Planning & Design Section

- Master Plan water supply
- Detailed Engineering Design
- Capacity & capability of section to expand the system.

A. 2.6 Production Section

- Water Quality regular testing & record.
- Relation with public health on water quality control

A. 2.7 Private Sector & NGO

- The role of private sector & NGO on the development of Water supply

B. INDIVIDUAL INTERVIEW

Access to Safe Water

- Why access to safe water in most of urban areas in Indonesia is less than 40% and Unaccounted For Water (UFW) is almost 40%?

- What are the main constraints if the water supply enterprises in Indonesia are operated in commercial way?

- What factors should be reoriented / reformed in order to increase access to safe water in Indonesia?

- What is the strategic development planning in water supply sector in Indonesia for the next 10 years?

- Is there a structured human resource development planning in water supply sector in Indonesia?

BIBLIOGRAPHY

Abella, M.I. (1998) ***Migration and Regional Economic Integration in Asia: Emigration Pressure in Selected Asia Countries***, Geneva: OECD Proceedings.

AGRAWAL,N. (1995) ***'Indonesia - Labour Market Policies and International Competitiveness'***, Collection Title Policy, Research working paper; No. WPS 1515, The World Bank.

Anderson, T.L. (1983) ***Water Rights: Scarce Resource Allocation, Bureaucracy, and the Environment***, Cambridge, Mass. : Ballinger Pub. Co.

Asian Development Bank, Office of the Environment. (1990) ***Environmental guidelines for selected infrastructure projects***, Manila: Asian Development Bank.

Asian Population Studies Series No. 43. (1978) "Measuring the Social Impact of Population Trends and Development", Economic and Social Commission for Asia and The Pacific in cooperation with the Population Center Foundation of The Philippines , United Nations.

AusAID (1996) ***'Environmental Assessment Guidelines for Australia's Aid Program'***, Canberra: AusAID.

Bappeda 2 Dili (1996) '***Dili Water Supply Master Plan'***, Dili.

Bappenas (1988) '***Billing Rate, 1998***', Number : 604/D.VI/02/1998.

Baswir, R. in KOMPAS. (1999) '***Jangan Biarkan Pemborosan Dana Public***', (Don't let Public Fund be Wasted), edisi 10 December.

Baumol, W.J. and Blinder, A.S. (1991) ***Economics Principles and Policy***, 5th. Ed. USA: Harcourt Brace Jovanovitch, Publisher.

Biro Pusat Statistik (1996), '***Penduduk Indonesia***', Jakarta: BPS.

Blake, G.H and Lawless, R.I (1980) ***The Changing Middle Eastern City*** London: Croom Helm.

Brunn, D.S. and Williams, F.J. (1993) ***Cities of the World***, 2nd ed., New York: Harper Collins College Publisher.

Chamberlain, N.W. (1972) ***Beyond Malthus, Population and Power*** USA: Prentice-Hall.

Chambers, R. (1993) ***Rural Development: Putting the Last First***, London: Longman.

Clarck, D. (1996), ***Urban World / Global City***, London: Routledge.

Correspondence Letter sent by PDAM Bondowoso to the writer, Oct. 1999.

Correspondence Letter sent by PDAM Lampung to the author, Oct. 1999.

Correspondence Letter sent by PDAM Lombok Tengah to the author, Oct. 1999.

Correspondence Letter sent by PDAM Minahasa to the author, October 1999.

Correspondence Letter sent by PDAM Tegal to the author, October 1999.

Damanhuri, D.S. (1996) ***Ekonomi Politik Alternatif, Agenda Reformasi Abad 21***, Jakarta: Pustaka Sinar Harapan.

Devas & Rakodi, C. (1993) ***Managing Fast Growing Cities, New Approach to Urban Planning and Management in the Developing World***, Singapore: Longman Scientific & Technical.

Dian Desa, (1990) ***Monitoring and Evaluation of Public Hydrants Water Terminals in North Jakarta***, Bappenas, UNICEF, Yogyakarta.

Dickenson, J.,Gould,B, Clarke,C., Mather,S., Prothero,M., Siddle,D., Smith,C.,and Thomas-Hope,E. (1996) ***Geography of the Third World***, 2nd. Ed., London: Routledge.

Dunn, P.D. (1979) ***Appropriate Technology: Technology With a Human Face***, New York: Schoken Books.

Econit in KOMPAS (1999) '***Prediksi Tahunan Econit, Tahun 2000, Tahun Kelahiran Kembali Indonesia***', Jakarta: KOMPAS, 16 December 1999.

Econit in KOMPAS (1999) '***Tekanan Terhadap Rupiah Masih Akan Berlanjut***', Jakarta: KOMPAS, 5 December.

Engelman, R. (1997) ***Why Population Matters***, Washington: Population Action.

Environmental control and public health. (1985) '***Water supply and demand, Water quality, water experiments***' Milton Keynes: Open University Press.

Firman, T (1998) ***'The restructuring of Jakarta Metropolitan Area'***, in **Cities** Vol.15 No.4, Great Britain: Pergamon, pp229-243.

Forbes,D. (1996) ***Asian Metropolis',*** Melbourne: Oxford University Press.

Friedmann, J. (1992) ***Empowerment: The Politics of Alternative Development***, Cambridge: Blackwell.

Funnel, B.M and Hey, R.D. (1971) ***The Management of Water Resources in England and Wales***, Farnborough: Saxon House.

Graham, M (1984) ***Common sense and the population problem***, Braunton: Merlin.

Herijanto, J. (1998) ***Risk Analysis of Public-Private Contracts in Indonesia Water Supply***, Institute for Infrastructural, Hydraulic and Environmental Engineering – The Netherlands, IHE Delft.

The World Bank (1994) ***World Development Report 1994, Infrastructure for Development***, Washington: Oxford University Press.

Infratama Yakti & Waseco Tirta (1988) '*Outline Plan Design PDAM Pekan Baru*', PDAM Pekan Baru, No.347/Kontrak/PDAM/VI/1988.

Khan, M.A. (1996) ***Economic Development, Poverty Alleviation and Governance : the Asian experience***, Brookfield, Vt. : Avebury.

King, S and Maddok, R. (1996) ***Unlocking the Infrastructure, The Reform of Public Utilities in Australia***, Sydney: Allen & Unwin.

KOMPAS (1998) '*The Salary of Indonesian Civil Servants: Can not meet the minimum cost of living'*, Jakarta: Kompas, 13 September.

KOMPAS (1999) '*DPR Juga Mengecam Keras Bappenas*', Jakarta: 4 December.

Leonard, R. (1987) ***Engineering Aspects of Water Law***, New York : Wiley.

Lipton, M. (1977) ***Why Poor People Stay Poor: Urban Bias in World Development***, London: Temple Smith, pp13-24.

Locussol, A. (1997) ***'Indonesian Urban Water Supply Sector Policy Framework'***, Indonesian Discussion Paper Series Number 10, East Asia and Pacific Region, The World Bank.

Majalah Air Minum No. 79, Jakarta: Perpamsi

Majumdar, P. and Majumdar, L. (1978) ***Rural Migrants in an Urban Setting***, Delhi: Hindustan Publishing Corporation Printing Press.

Marcel, Z.K. (1995) 'Participation of the Private Sector in The Delivery of Water Supply and Sanitation Services', Sodeci Company, in ***Management Options & Private Sector Participation in The Delivery of Water Supply & Sewerage Services***, Bandung, April 3 – 6, 1995, conference paper.

Martin, B. (1993) ***In the Public Interest, Privatisation and Public Interest***, London: Zed Books.

Merrett, S. (1997) ***Introduction to the economics of water resources : an international perspective***, Bristol, Pa. : UCL Press.

MoHA (1997) '*Memorandum of Understanding of the Fact Finding Mission for the Proposed Water Loss Reduction Sector Project in Indonesia*', Subdit Bina Perusahaan Daerah, Direktorat Bina Pendapatan Daerah, Dirjen PUOD, Depdagri.

MoHA,(1994) '*Decree Letter of MoHA (SK Mendagri), No. 690.900-327, 1994 regarding Guidelines in evaluating and monitoring financial performance of PDAM*'.

MoHA,(1996) '*Decree of MoHA (SK Mendagri), No 800.690-151, 1996 regarding Classification PDAM and Staff Carrier System of PDAM*'.

MoHA (1997) '*Permendagri, No 1, 1997 tentang Daftar Gaji Pokok dan Masa Kerja Pegawai Perusahaan Daerah Air Minum*'.

Mosley,P. (1996) '***Asia Pacific Viewpoint'***, Volume 37, Number 3, December 1996, p215-218.

OECD (1987) ***Pricing of Water Services,*** Paris: OECD.

Overton, J. (1998), Module 3, 31.701 '***Development and Underdevelopment, New Perspectives***', Palmerston North: Massey University.

Pathak, B. (1999) 'Healthy cities, Neighbourhoods, and homes' in ***Environment and Urbanisation***, volume 11 Number 1 April 1999

Pernia, M.E and Alabastro, LF.S (1997) ***Aspects of Urban Water and Sanitation in the Context of Rapid Urbanisation in Developing Asia,*** Manila: ADB.

PERPAMSI, (1995) ***Direktori 1995: Indonesian Water Supply Association***. Jakarta: PERPAMSI.

PERPAMSI, (1998) ***Direktori 1998: Indonesian Water Supply Association***. Jakarta: PERPAMSI.

Pirez, P.(1999) 'Healthy cities, Neighbourhoods, and homes' in ***Environment and Urbanisation***, volume 11 Number 1 April 1999

Pollard, E and Liebeck, H. (1994) 'Dictionary', Kent, Oxford University Press, 4th ed.

Postel, S (1984) '***Water: Rethinking Management in an Age of Scarcity***' World Watch Paper 62, Washington: Worldwatch Institute.

Postel, S (1992) ***The Last Oasis,*** London: Earthscan Publications Limited.

Potter,R.B., Binns,T., Elliot,J.a., Smith, D., (1999) ***"Geographies of Development"***, Singapore: Longman.

Public Finance Foundation (July 1985). '*Privatisation in the Water Industry*', Proceeding of a Foundation Seminar, PDF Discussion Paper No. 6, Leicester: Leicester University.

Rahnema, Madjid (1992) 'Participation' in Sachs, Wolfgang (ed.) ***The Development Dictionary***. London: Zed Books, pp 116-131.

Richard C. P (1996) **The economics of water and waste : a case study of Jakarta Indonesia,** Avebury ; Brookfield, Vt., USA : Ashgate.

'***Usulan Bantuan Kepada PDAM-PDAM di Jawa Barat, Dalam Rangka Menyikapi Kondisi Saat Ini***', September 1998 [this paper was provided by PDAM Kabupaten Bandung in September 1999 during my field visit.].

Satterthwaite, D (1999) ***Sustainable Cities***, London: Earthscan Publication ltd.

Stephenson, D (1991) ***Water resources development in developing countries***, New York: Elsevier Science Pub. Co.

Sudibyo, B (1999) 'Gaji PNS Hanya Naik 20 Persen' (Salary civil servant increase only 20 percent). Jakarta: KOMPAS, 10 December.

Surat Keputusan MenNaker RI No. Kep-81/Men/1995 tentang' *Perkiraan Kebutuhan Hidup Minimum (KHM) Pekerja* 'Kompas edisi 13/9/98.

Susilo Bambang Yudoyono (1999) 'Diusulkan, Listrik Naik 35 Persen dan BBM 20 Persen', Jakarta: KOMPAS, December 14.

Tadle,M.A et.al (1990) *'**Evaluation of water supply projects : an economic framework**'* Manila: Economics and Development Resource Centre, Project Economic Evaluation Division, Asian Development Bank.

The World Bank (1994) ***World Development Report 1994,*** Oxford University Press.

The World Bank (March, 1999) 'Indonesia, Country Assistance Strategy Progress Report', the World Bank Group, Report No. 18963 IND.

The World Bank Group, Press Release No. 96/69S

Thomas, J.C (1994) ***Sustainable Operations and Maintenance of Water Supply: A Conceptual Model for Engineers and Development Worker***, Palmerston North: Massey University Mphil.Thesis.

Tobin, A.G (1979 ed.) *'The Changing Structure of the City'*, **Urban Affair Annual Reviews**, Vol. 16, California: Sage Publications Inc.

UNCHS (Habitat) (1989) ***Water supply in low-income housing projects : the scope for community participation*** ; training module, United Nations Centre for Human Settlements (Habitat).

United Nations (1992) '***Legal Aspect of Privatization in Industry***', Economic Commision for Europe, New York: United Nations.

United Nations (1999) ***Privatisation of Public Sector Activities, with a special focus on telecommunication, energy, health and community services*** Department of Economic and Social Affairs, Division for Public Economics and Public Administration, New York: United Nations.

United Nations Development Programme (1991) '***Guidelines on Privatisation, Interregional Network on Privatisation***' Division for Global and Interregional Programmes, UNDP.

Urban Age, The Global City Magazine (1999) ***'The Future of the Water'*** Washington: United Lithographic.

Walsh, A.C (1995) ***Getting On Top of Your Thesis,*** Palmerston North: Massey University: Amokura Publications.

Watercare (1999) ***Annual Report*** for the ended 30 June 1999, Watercare Service Limited, Auckland.

Watercare (1999) ***Environmental Annual Report 1998-1999***, Watercare Service Limited, Auckland (www.watercare.co.nz).