Includes a CD containing technical reports published by the Indonesia Infrastructure Initiative, 2010–2011

PRAKARSA

COMPENDIUM

Highlights from the Journal of the Indonesia Infrastructure Initiative, **2010–2011**

Australia Indonesia Partnership
Kemitraan Australia Indonesia

Prakarsa Compendium

Highlights from the Journal of the
Indonesia Infrastructure Initiative, 2010–2011

Prakarsa Compendium
Edited by Carol S. Walker
Published by the Indonesia Infrastructure Initiative

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Carol S. Walker, editor
June 2011

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Prakarsa Compendium

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FOREWORD

Dr. Ir. Dedy Priatna, M.Sc.
Deputy Minister for Infrastructure Affairs
Bappenas

Developing a country's infrastructure is an enormous undertaking. This is especially true in a nation such as Indonesia, where there is much to be done throughout many sectors, in locations ranging from urban to remote, across sea and varied terrain. No nation can expect to make significant progress in the face of such challenges unless it establishes a clear set of priorities. The Government of Indonesia recognises this, and has identified the most critical areas for infrastructure enhancement.

Indonesia has a strong focus on improving access to water, especially among low income citizens. Similarly, the Government is striving to improve sanitation, both sewage and solid waste. In addition, the Government is emphasising the development of the transport sector, including transport by road, rail, sea, and air.

Our concentration on the water, sanitation and transport sectors is driven by the understanding that this infrastructure enhancement will lead to two important outcomes. First, it will directly improve quality of life for ordinary citizens. Second, it will encourage the levels of investment that are needed to achieve greater economic growth and prosperity.

As the pages of this publication demonstrate, the Indonesia Infrastructure Initiative (IndII) is well aligned with these Government priorities. In these pages, which bring together more than a year's worth of features from IndII's journal ***Prakarsa***, you can read about the Hibah programme that is successfully using output-based grant mechanisms to improve access to water. You can discover how innovative strategies are improving the external environment in which local water companies operate. You can learn how Indonesia is implementing the best possible tools to make complex decisions regarding budgets and road development. The topics covered by ***Prakarsa*** are a reflection of the ways that IndII is responsive to Government of Indonesia priorities.

The provision of sound infrastructure – including the creation of a landscape that encourages the private sector to build infrastructure – is one of the fundamental responsibilities of every government. The ideas expressed in the following pages demonstrate many of the methods we are using to fulfill this responsibility. •

FOREWORD

Jacqui De Lacy
Minister-Counsellor, AusAID Indonesia

Australia and Indonesia have formed a lasting partnership to enhance infrastructure for the benefit of Indonesia's citizens. This partnership takes many forms. As described in the pages of the book you are holding, it includes groundbreaking efforts to ensure greater access to improved water and sanitation, as well as to enhance the quality and safety of Indonesia's road network. The work doesn't stop there: through channels such as the AusAID-funded Indonesia Infrastructure Initiative, Australia has teamed up with Indonesia to improve seaports, air navigation, railways and urban mobility.

None of this work is as straightforward as installing a new pipe, erecting a tower or constructing a road. Underlying these physical achievements is a universal set of challenges that policy makers in all countries must confront before they can begin to build. Resources are scarce, so decision-makers must choose among competing priorities. Stakeholders have wildly differing but equally valid perspectives, so a broad range of groups must be consulted before plans are finalised. The "best" solution may depend on how far into the future one looks, so the most appropriate time horizon must be selected. Benefits may be intangible or hard to define, so clear measurements of outputs must be devised.

These difficult tasks are easier when policy makers have access to the right tools and insights. That is where the journal ***Prakarsa*** makes a contribution. By examining questions of infrastructure policy and how Indonesia is addressing them, it stimulates fresh thinking about the best approaches.

This volume, which includes ***Prakarsa*** journal articles on topics ranging from water access to financing to urban mobility, provides a useful overview of the innovative strategies that decision-makers and technical experts are using to enhance Indonesian infrastructure. Readers will come away with a sense of the magnitude and urgency of Indonesia's infrastructure needs. They will also realise the scope of the effort that the Government of Indonesia is making to address these needs. As this compendium makes clear, the work that lies ahead is challenging but has the potential not simply to enhance infrastructure, but to improve lives. •

INTRODUCTION

David Ray
Facility Director

The quarterly publication ***Prakarsa*** has proven to be a popular and effective communications vehicle for the Indonesia Infrastructure Initiative (IndII). Unlike a typical newsletter of the sort published by many organisations, the goal of ***Prakarsa*** is not to publicise the work that IndII has done, nor to give detailed information about planned or ongoing programming. (Readers who are looking for that information are encouraged to visit the IndII website at www.indii.co.id.)

Instead, ***Prakarsa*** was designed as a thoughtful journal, intended to stimulate ideas and discussion on the key sectors and issues that IndII is working on. By offering insights into the policy landscape and describing constraints, best practices, and innovations, the journal complements IndII's other communications tools. IndII's programming is discussed in many articles, but always with the intent of illustrating a larger picture rather than simply describing the activities IndII is undertaking.

With each edition focused on a single theme, the goal of ***Prakarsa*** is to provide a concise, accessible and readable introduction to the various issues and problems associated with a particular aspect of improved infrastructure delivery in Indonesia. After the first edition, which offered a general overview of many of the primary issues IndII is confronting, subsequent issues have addressed the following key infrastructure themes: railway development; infrastructure financing; access to water; road development; urban mobility; and urban sanitation. These topics reflect IndII's areas of concentration, although not exhaustively so – road safety, air transport, and ports are also high on IndII's list of key sectors, and will likely represent themes for upcoming editions of ***Prakarsa***, in the expected second phase of IndII.

The end of IndII's first phase in June 2011 is a fitting time to consider and consolidate what IndII has achieved up to this point. As one part of that, we have prepared this volume, which collects features and other material from the seven issues of ***Prakarsa*** published during IndII's first phase. Where appropriate, authors have provided updates to their original articles, giving readers a sense of what has changed since they first wrote. Particularly when presented together with these updates, the articles serve as a reminder that efforts to deliver enhanced infrastructure operate within a dynamic framework. For those who wish to understand that framework, and the challenges and opportunities within Indonesia's infrastructure sector, this compendium will offer valuable insights. •

Introducing the Indonesia Infrastructure Initiative

January, 2010

KEY POINTS *on the Infrastructure Policy Framework*

The goal of the Indonesia Infrastructure Initiative (IndII) is to assist the Government of Indonesia (GoI) to enhance the nation's infrastructure by helping the GoI to become expert at instituting sound infrastructure policy and regulations, designing and implementing national master plans, and facilitating infrastructure investment. Ideally this will lead to the maximum possible long term impact.

IndII's efforts are urgently needed, especially in urban areas, due to years of underinvestment in key assets. GoI leaders are making it a policy priority to confront infrastructure development challenges. This is the context within which the Australian Government conceived of IndII, establishing as its goal assisting GoI to address infrastructure problems, particularly the water and sanitation sector and the transport sector. Cross-sectoral themes and priorities include public service obligations and infrastructure financing. IndII supports infrastructure reforms and activities at both the national and local levels, addressing such topics as access to commercial credit by local water companies, public service obligations to provide transport services on a non-commercial basis, road safety through better design, sanitation and water connections for low income households, rail and port sector master planning, procurement and internal audit in the roads sector, medium term expenditure frameworks and performance-based budgeting, bus rapid transit planning and development, and city sanitation master planning.

Throughout all of these activities, IndII never loses sight of its overarching objective to strengthen the policy and institutional framework for infrastructure reform and development. Accordingly, IndII programming has been developed within the framework of the GoI five-year development plan (RJPM) and recent Inpres policy reform packages, as well as the policy agendas supported by the World Bank and Asian Development Bank through their lending programs. IndII programming also builds upon important sectoral initiatives within the GoI policy agenda.

Supporting Indonesia's Infrastructure Policy Framework

The Indonesia Infrastructure Initiative assists the Indonesian Government to develop infrastructure at many levels, but its premise is that a sound policy and planning environment must underpin all of its diverse efforts.

David Ray

Put in its simplest terms, the goal of the Indonesia Infrastructure Initiative (IndII) is to assist the Government of Indonesia (GoI) to enhance the nation's infrastructure. Anyone hearing this for the first time will most likely think of the tangible results that can be achieved: building and repairing roads, developing new water treatment facilities, connecting more urban dwellers to piped water, or constructing needed storage facilities at a seaport.

The efforts of IndII will indeed contribute to these final outcomes. But *IndII does not exist solely to promote particular construction projects.* If it did, its effect would ultimately be limited to those

specific activities, and when IndII concludes, it would have little additional impact on Indonesian development.

IndII has far more significant aspirations. The focus of IndII is less on particular construction projects and more on helping the GoI to become expert at instituting sound infrastructure policy and regulations, designing and implementing national master plans, creating effective Public Private Partnerships (PPP), and facilitating infrastructure investment. In short, IndII aims to create an environment where the GoI's infrastructure development activities will be carried out in a manner that ensures maximum possible impact over the long term.

IndII's efforts are urgently needed. Years of underinvestment in key assets – such as ports, railways, roads, and water and sanitation systems – have left Indonesia with a major infrastructure deficit. The problem is particularly serious in urban areas, where inadequate water, sanitation and transport facilities are undermining living standards and constraining growth. With the urban population projected to increase by over 100 million people by mid-century, the strain on Indonesia's already overburdened urban infrastructure is likely to worsen.

GoI leaders are increasingly making it a policy priority to confront these challenges. Promisingly, infrastructure issues have featured prominently in policy statements by the new administration of President Susilo Bambang Yudhoyono, such as the 100-day programme.

A Broad Range of Programming

This is the context within which the Australian Government conceived of IndII, establishing as its goal assisting GoI to address many of the infrastructure problems that now constrain economic growth. IndII is primarily focused on the watsan (water and sanitation) and transport sectors, as well as a number of cross-sectoral themes and priorities such as PPP, public service obligations, and infrastructure financing. Programmatically, IndII works at various levels: from policy and planning down to more "hands-on" infrastructure project preparation, management and facilitation, and even direct investment (using government systems) in hard infrastructure through grants.

IndII supports infrastructure reforms and activities at both the national and local levels, addressing such topics as access to commercial credit by local water companies, public service obligations to provide transport services on a non-commercial basis, road safety through better design, sanitation and water connections for low income households, rail and port sector master planning, procurement and internal audit in the roads sector, medium term expenditure frameworks and performance-based budgeting, bus rapid transit planning and development, and city sanitation master planning, amongst others.

Fitting Within Larger Agendas

Throughout all of these activities, IndII never loses sight of its overarching objective to strengthen the policy and institutional framework for infrastructure reform and development. Accordingly, IndII programming has been developed within the framework of the GoI five-year development plan (RJPM) and recent Inpres policy reform packages, as well as the policy agendas supported by the World Bank and Asian Development Bank through their lending programs. IndII programming also builds upon important sectoral initiatives within the GoI policy agenda. These include recent

The Port of Tanjung Perak in Surabaya. Improving port operations is essential to improving the investment environment. *Courtesy of BBC World Service*

policy initiatives to overcome debt problems in the water sector and to generate incentives for local governments to re-invest in their water utility companies, as well as other initiatives in the sanitation sectors such as carrying out a 2005 law to ban open dumping sites and to transition to sanitary landfills.

The Example of the Transport Sector

One of IndII's crucial sectoral initiatives relates to recent regulatory and institutional reform in the transport sector. Over the past few decades this sector has lagged in terms of investment and overall development relative to other infrastructure sectors. Consequences of this include: a congested and poorly equipped port system that generates high costs for international and inter-island shipping; an underfunded passenger railway system unable to compete with other transport modes, particularly the subsidised road system; a lack of safe, comfortable and rapid commuter transit options in large cities, resulting in growing reliance on private vehicles; and an increasingly unsafe road network causing up to 40,000 fatalities each year.

Reform and development of transport infrastructure is now a key policy priority of the GoI, and

the past few years have seen important legislation passed related to sea, rail, air and road transport. These legislative changes are broad-ranging and, in general, introduce best-practice reforms such as dismantling legislated state-owned monopolies, opening the door to private sector operators and better defining the role of the government to focus on regulatory matters and the provision of basic infrastructure.

Whilst this legislation provides the foundation for potential landmark sector reforms, considerable effort will be required to develop the necessary supporting regulatory and institutional framework to ensure effective implementation.

Consider the case of the sea transport law, which requires the implementation of the landlord port concept. This in turn requires further regulation and the development of new institutions, namely port authorities that will regulate terminal operations in dozens, if not hundreds, of ports. However, before these port authorities can be established, a set of policy decisions needs to be taken nationally on a range of issues including: port land access and titling, the role of local governments, spatial planning and port locations, transitioning the state-owned port operator Pelindo from monopolist provider to operator, managing competition within ports, and the role of PPP. In addition, an effort must be made to determine the likely demand for port services in coming decades and how best the national port system can respond to this demand.

These and many other issues will be dealt with as part of the National Port Master Plan (NPMP), a crucial document providing the regulatory and supervisory framework for development of the ports system over the next two decades. Under the umbrella of the NPMP there will be individual port master plans, which in turn will provide the governance framework for the port authorities to regulate operations at the port level. Before port authorities can become operational they need to map out in their master plans how they are going to regulate and price access to key resources such as land and basic port infrastructure, how competition between newcomers and incumbents and how concession agreements are going to be managed, and finally how port orderliness, security and environmental sustainability are to be maintained. This is clearly a challenging set of tasks for any developing country institutions, let alone ones that have yet to be formed and that will be staffed solely by public servants with limited background in port operations and management.

IndII supports infrastructure reforms and activities at both the national and local levels.

Development of the necessary regulatory and institutional framework to implement the landlord port concept (comprising the NPMP, individual port master plans and empowerment of the port authorities) will take a minimum of three to five years. Given its limited time horizon, IndII will focus its activities on assisting the Ministry of Transport (MoT) to develop the best possible national master plan that lays the foundation for a substantial upgrading and comprehensive reform of the ports system. If time permits, IndII may also work with the MoT in the follow-on activity to develop master plans for selected ports, thereby more directly assisting and facilitating new opportunities for private sector investment in terminals and other port facilities.

IndII's focus on assisting Indonesia's port development by concentrating on the NPMP is a good illustration of the IndII approach. Building an institutional framework is an ambitious undertaking, but one that will pay off in enhanced economic growth for years to come. •

About the author:
David Ray is the Director of IndII. As an economist, he has worked on a broad range of microeconomic policy issues in Indonesia, including investment, competition, logistics, trade, and decentralisation as well as business regulation reform. Prior to working with IndII, David was employed on a number of USAID-funded projects, primarily in Indonesia and Vietnam.

Author's Update

IndII has had, and continues to have, an important focus on policy and institutional reform. There is much to be done in this regard, particularly in the transport sector, due to the lack of maturity in the policy and institutional settings and arrangements. This is a key reason why investment in this sector has been disappointing over the past decade or so.

An important finding made during the first phase of IndII was that a common problem undermining infrastructure investment is the lack of sound front-end preparatory work on projects. There remains a serious need for more quality assistance – this is particularly urgent for two reasons: first, the quality of services in key infrastructure sectors (such as various transport modes, water, wastewater and solid waste) is poor; and second, there are funds available from both public and private sources, but the persistent bottleneck is the lack of good planning and feasibility studies. Over the first phase of the facility, IndII has moved to provide key assistance in this regard, such as the preparation of wastewater masterplans for eight cities. Project preparation will remain as a growing focus in the subsequent programme.

IndII has also explored the use of innovative, results-based financing mechanisms by way of output and performance-based grant programming, as a means to promote institutional commitment to water and sanitation services at the local level. Programming tools such as these show great promise as a way to complement and bolster efforts to promote policy and institutional reforms. ■

KEY POINTS *on Increasing Access to Piped Water*

Today, most of Indonesia's city dwellers obtain their water from private wells, communal supplies, or – most expensively – from street vendors. For those with piped connections, common problems include low pressure, limited hours of operation, and poor water quality.

Regional autonomy has shifted primary responsibility for water services to local governments. In most urban areas, the task is assigned to local water companies (PDAMs), many of whom struggle to serve existing customers, let alone expand. The poor performance of many PDAMs can be traced to the governments that own and regulate them. Key issues include a reluctance to raise tariffs, the appointment of ill-qualified directors, and withdrawal of cash surpluses as dividends. PDAMs are often unable to fund needed maintenance work. Consequent leaks from mains and distribution networks – compounded by damaged meters and unregistered connections – result in many PDAMs charging for only a little more than half the water they actually produce.

This picture is changing for the better. At the local level, the direct election of mayors and district heads combined with a free press has focused attention on the quality of infrastructure services. At the central level, mounting concern about slow progress towards Millennium Development Goal targets, coupled with a strengthening fiscal outlook, led the Government of Indonesia (GoI) to announce in 2008 a target of connecting 10 million households within three to five years. Previously in 2006, the Minister of Home Affairs had issued tariff guidelines designed to enable full cost recovery while requiring a lifeline tariff for poor households, though implementation of these guidelines has proceeded slowly.

In mid-2008, a voluntary debt-restructuring scheme was introduced, targeted to PDAMs that had defaulted on debt service payments to the Ministry of Finance. Around half of the PDAMs with arrears have so far applied to join the scheme.

To complement this initiative, a central government loan guarantee and interest subsidy scheme has been created that will assist PDAMs in obtaining affordable medium term loans from commercial banks. Participation is open to PDAMs that have "healthy" audit ratings or that have been approved to join the restructuring programme.

The third plank of the Government's evolving strategy is an output-based grant scheme. Under this initiative, participating local governments will receive a lump sum payment for each new piped water connection completed.

IndII is assisting the government with implementing the debt restructuring and loan guarantee scheme. IndII has played a key role in developing the overall concept for the grant under the WSI Indonesia programme and is overseeing the implementation of the Water and Sanitation Hibah programmes on behalf of AusAID. All of these interrelated activities will help Indonesia to reverse the trend and increase the proportion of its citizens with access to piped water.

From Jerry Cans to Taps: Bringing Water to the People

Increasing urbanisation, government decentralisation, and historical underinvestment are among the challenges that Indonesia faces as it increases its citizens' access to piped water services.

David Hawes

Today, fewer than one third of Indonesia's urban households enjoy a piped water connection. Due to rapid population growth and sustained underinvestment, that proportion has actually declined over the past decade. Consequently, most city and town dwellers still obtain their water from private wells, communal supplies, or – most expensively of all – passing street vendors.

For those fortunate enough to have connections, the quality of service is often unsatisfactory. Common problems include low pressure, limited hours of operation, and poor water quality. Only one city – Malang – is certified to supply water suitable for drinking, and that to only part of its service area. Elsewhere, households must still boil their tap water or else support Indonesia's booming bottled water industry.

Regional autonomy has shifted primary responsibility for water services to municipal and district governments. In most urban areas, the task is assigned to local water companies (PDAMs). There are currently some 350 PDAMs, but many struggle to serve existing customers, let alone expand. By 2008, over half had defaulted on debt service payments to the Ministry of Finance (MoF) and were consequently unable to access new borrowings.

The poor performance of many PDAMs can be traced to the local governments that own and regulate them. Key issues include a reluctance to raise tariffs to the level needed to cover costs, the appointment of ill-qualified directors, and withdrawal of cash surpluses as dividends. Starved of resources, PDAMs are often able to do little more than meet daily operational costs, and are unable to fund needed maintenance work. Consequent leaks from mains and distribution networks – compounded by damaged meters and unregistered connections – result in many PDAMs

A family in Sunter, North Jakarta draws groundwater from a shallow well in 2003. Groundwater table depletion and saline intrusion has made wells in North Jakarta largely unusable. *Courtesy of Jim Coucouvinis*

being able to charge for only a little more than half the water they actually produce.

Pressure to Improve

This picture has recently started to change for the better. At the local level, the direct election of mayors and district heads combined with a very free press has focused increased attention on the quality of public services, and especially infrastructure services. Put simply, local governments now face much stronger pressure to perform. At the central level, mounting concern about slow progress towards MDG (Millennium Development Goal) targets, coupled with a strengthening fiscal outlook, led the Government of Indonesia (GoI) to announce in 2008 a target of connecting 10 million households within three to five years. To place this in perspective, less than 8 million households have connections today.

Initial moves to improve PDAM performance had commenced somewhat earlier. Perhaps most importantly, in 2006 the Minister of Home Affairs issued new tariff guidelines designed to enable full cost recovery while requiring a lifeline tariff for poor households. The lifeline tariff is designed to enable a poor family to obtain its basic water needs for 4 percent of the provincial minimum wage. In a poor province, this translates into a daily expenditure of around Rp 1000 for 300 litres of water per day. By way of comparison, dwellers in Jakarta's kampung now pay street vendors as much as Rp 1000 for a 20-litre container. Perhaps unsurprisingly, implementation of the guidelines has proceeded slowly, with average tariffs charged by poorly performing PDAMs still far below the ceiling lifeline level.

More recently, the GoI's attention has turned to measures aimed at stimulating new water supply investments. In mid-2008, a voluntary debt-restructuring scheme was introduced, targeted to PDAMs that had defaulted on debt service payments to the MoF. This scheme provides for writing off interest arrears and penalties in return for defined governance and performance commitments by the local governments and PDAMs. These include implementation of full cost recovery tariffs and use of "fit and proper" tests for senior management appointments. Around half of the PDAMs with arrears have so far applied to join the scheme.

To complement this initiative, a central government loan guarantee and interest subsidy scheme is in the process of being created. This scheme will assist PDAMs in obtaining affordable medium term loans from commercial banks. The terms and conditions are rather complex, but from the lending bank's perspective 70 percent of outstanding repayment obligations are guaranteed, while from the PDAM's perspective the loan interest rate can be reduced by up to 5 percent. Participation in this scheme is open to PDAMs that have "healthy" audit ratings or that have been approved to join the restructuring programme.

An Output-Based Strategy

The third plank of the Government's evolving strategy – and the one which is likely to have the most rapid impact – is an output-based grant scheme. Under this initiative, participating local governments will receive a lump sum payment for each new piped water connection completed. This scheme has been jointly designed by the Ministry of Public Works (MPW) and the MoF in close consultation with Bappenas. It has drawn on advisory assistance from the World Bank and the Indonesia Infrastructure Initiative (IndII). Implementation will be piloted in 2010, with parallel programmes being funded by Indonesia's state budget and the Government of Australia's Water and Sanitation Initiative (WSI).

The shift to an output-based approach represents an important policy change by the GoI, and has been made possible by the new grant (hibah) mechanism established by the MoF in 2008. There are some important differences between this and the existing special allocation funds (Dana Alokasi Khusus) transfer mechanism. For example, the hibah programme requires local governments to lodge plans that link payments to defined performance milestones and conditions. These plans must be approved prior to signing agreements with the MoF.

The use of output-based approaches for extending water supply services is already being piloted in Surabaya and Jakarta. These relatively small programmes are being funded by the Global Partnership for Output-Based Aid and assisted by the World Bank. The proposed WSI programme incorporates similar elements, but is significantly larger in amount and coverage. The available funds are AU$ 20 million, which is expected to support the completion of 70,000 new connections. This will serve some 420,000 people in predominantly poor districts of 25 towns and cities by June 2011.

Local governments and their PDAMs have shown strong interest in participating in the WSI programme, and the MPW has conducted a screening process to select which ones will

be included. In line with the loan guarantee and interest subsidy scheme, the intent is to prioritise PDAMs which have a "healthy" audit rating or have been accepted into the MoF debt-restructuring scheme, and which also have a sound connections programme ready for implementation in 2010. In addition, participating local governments and/or PDAMs must be able to pre-finance their proposed investment programmes.

Ensuring Sustainability

The WSI programme aims to enable the connecting of poor households while supporting improved PDAM sustainability. Since the Ministry of Home Affairs guideline requires low lifeline tariffs to be cross-subsidised by other customers, this requires connecting a mix of low- and higher- income customers. For the 2010 pilot, there must be at least one poor household connection for each non-poor household included in the grant claim. This will incentivise PDAMs to discount upfront connection charges or to offer instalment payment plans.

The model grant agreement is now being finalised and will specify elements that include: the amount of grant per verified new connection, the ceiling grant amount available, the procedures for verification, and preconditions for grant payment. The grant amount will be Rp 2 million per connection for the first 1000 connections and Rp 3 million per connection thereafter. To obtain payment, connections must be independently verified to have supplied water for at least three months. In addition, a local government must demonstrate that it has injected equity into its PDAM at least equal to the amount of grant money claimed.

IndII has played a key role in developing the overall concept for the approximately AU$ 60 million WSI Indonesia programme, as well as in designing the Water Hibah programme and a similar Sanitation Hibah scheme which will support new connections to the existing sewerage systems in Banjarmasin and Surakarta. WSI, through IndII, will also finance the preparation of sanitation investment plans for four cities.

In parallel with the WSI design work, IndII has financed technical assistance to an initial batch of PDAMs. This aims to improve their performance and thereby position them to access commercial loans or future hibah programmes. IndII will also play a key role in overseeing the implementation of the WSI Water and Sanitation Hibah programmes on behalf of AusAID. This will involve assisting the MPW to conduct baseline surveys for the planned water and sewerage connection programmes and, very importantly, to undertake the verification surveys that will form the basis for grant payments. All of these interrelated activities will help Indonesia to reverse the trend and increase the proportion of its citizens with access to piped water. ●

About the author:
David Hawes has served as the Infrastructure Policy Advisor for AusAID's Indonesia programme since 2007. David has broad road infrastructure sector experience, including in transport (road, railways, ports, airports, inland waterways, and pipelines), energy (power and gas), telecommunications, and urban infrastructure. He has worked on infrastructure development issues in Indonesia since 1980, principally in the fields of infrastructure policy formulation, planning, and project preparation and supervision. For 15 months prior to taking his current position, David was Team Leader for AusAID's Indonesia economic governance programme (TAMF). Before that, he spent 15 years with the World Bank in Jakarta, including as Sector Coordinator for Transport, Energy, and Telecoms.

Author's Update

When ***Prakarsa*** went to print in January 2010, the IndII Water Hibah programme had not yet started. Although we had completed the design and were making preparations for start-up, many questions remained unanswered:

- Would Local Governments (LGs) and PDAMs have sufficient interest in the programme to make approximately 70,000 new connections to poor households and absorb AU$ 20 million?
- Would the PDAMs spend more than the grant to make the new connections?
- Would LGs invest more than the grant in the PDAM?
- Would poor households connect, and what kind of special "deal" would be on offer from the PDAM?

As it turned out, the Hibah Programme exceeded all our expectations in these and other matters.

The PDAMs' Phobia – Poor Households are Poor Customers?

In January 2010, we were concerned that not more than 50 percent of the households financed by the Hibah should be poor. This concern was echoed by the PDAMs during the design process. The PDAMs were worried that poor households would not consume enough water to make it worthwhile for the PDAM to supply them. It is important to know that in selling water, there is no discount for volume. Rather the reverse is true. The higher the consumption, the higher the PDAM average price. The PDAMs figured that poor households would use small amounts of water and lower the PDAM average sale price. In any case, the PDAMs were not even sure that poor households would be willing to connect. This uncertainty was further compounded by the Ministry of Public Works insisting at the last minute that all connections for the Hibah had to be to poor households.

A Decision Vindicated

With these concerns foremost in the PDAMs' thinking, they set off with different strategies on how to connect poor households. Some PDAMs offered deep discounts for the connection. Others offered no discounts but allowed the cost of the connection to be paid in instalments. Many offered nominal discounts, and some offered a combination of both discounts and instalment payments. For the user charge, some PDAMs required a minimum monthly consumption fee while others offered a "pay for what you use" charge. By the end of February 2011, we had completed about 65 percent of the targeted connections during the first eight months and had approximately four months to complete the remaining 35 percent. Once connected, the poor households in most cases consumed and paid for more than the minimum consumption charge, vindicating the decision to cover 100 percent poor households. The flow-on benefits to the Bupati or Walikota from a satisfied constituency were unmistakable. When we solicited commitments for additional grants to absorb residual funds due to exchange rate savings we were oversubscribed with demand from the LGs and the PDAMs.

Retrospective

As we progressed, we found that some LGs invested more in their PDAMs than was required by the Hibah agreement. In turn many PDAMs spent more than the grant to reach poor customers. We even had some LGs reinvesting the Hibah into water infrastructure – something not required under the implementation rules but still very welcome. Of these observations, one aspect stands out about the success of the Water Hibah: the fact that the grant goes directly to the LG after the LG invests equal or greater funds in the PDAM. This formula has brought the stakeholders together in a way that has exceeded our expectations.

Future

There is much to test and refine with the Hibah. Ultimately we hope that this becomes a mainstream programme of GoI into which they channel their own and other donor funds. Our future programme will aim to achieve that with better economies on the use of the grant, and more competition by LGs to access grant funds. ■ — *Update by Jim Coucouvinis*

KEY POINTS *on the Wastewater Management Problem*

In Indonesian cities, as in much of the developing world, wastewater from toilets, bath, laundry and kitchen sinks is a major polluter. Poor urban sanitation conditions are a health hazard and ultimately a significant drag on the economy, with costs falling disproportionately on the poor.

Due to Indonesia's rapid urbanisation and industrialisation, workable solutions to urban wastewater problems are desperately needed. The Ministry of Public Works, Directorate General for Human Settlements is the agency most responsible for assisting city governments to resolve the wastewater problem. It has invited AusAID, through the Indonesia Infrastructure Initiative (IndII), to help tackle the problem. IndII has been asked to prepare master plans, feasibility studies and detailed engineering designs of wastewater investments, especially sewerage, for larger cities across the country.

In the developed world, reticulated gravity sewers are standard. But they can only be part of the solution in Indonesia – they are very expensive to build and operate, especially in crowded and still-developing cities. Although there are cheaper interventions available, such as on-site septic tanks and small reticulated communal systems, they also have not yet been widely accepted or proven. An integrated set of prioritised sanitation interventions is required, along with a strategy to ensure that limited resources are used in a complementary fashion. The difficulties involved include overcoming complex institutional obstacles as well as technical, economic and social challenges.

Sewerage systems are not entirely new to Indonesia, but there are just 11 cities with an operating system and for only small parts of each city. On-site treatment using septic tanks is the most common means of disposal. But septic tanks often leak, are ineffective in areas with a high water table and are not suitable for dense settlements.

Between the sewerage systems and on-site septic tanks extremes there are various off-site treatment options. Which one is the best choice depends not only on economic and technical criteria but also social acceptance and the resolve of city governments. This resolve is needed because urban sanitation problems cannot be separated from governance and management difficulties, which are particularly severe in urban areas.

IndII's response to this challenging situation is to not only identify technically and economically acceptable solutions appropriate for conditions in each target city, but to address institutional and political economy constraints. Historically, many good plans have been created but never fully realised. In planning its wastewater programmes, IndII is being careful to ensure that activities kick off in cities where the likelihood of successful implementation is high.

Solving the Wastewater Management Problem

After it swirls down the drain, where can waste water go without creating health and environmental hazards? The Indonesia Infrastructure Initiative is helping Indonesian cities to find answers to that question.

Andrew McLernon

Have you ever wondered where your toilet wastewater goes? And what of that from the bath, laundry and kitchen sink? In the developed world we generally can be confident it is safely collected and treated. Increasingly, it is recycled to benefit the environment. But in Indonesian cities, as in much of the developing world, this dangerous material just does not go away. Even if it can be removed from your toilet and kitchen (and your neighbour's), it appears again nearby – untreated, smelly, and still full of the germs that make it a danger to health. It becomes a major polluter of the urban environment and generally a nuisance, whether it is fouling your bore water, oozing up through your lounge floor in the wet season, stagnating in open mosquito-infested drains or leaking into downstream environments. Poor urban sanitation conditions are a health hazard and ultimately a significant drag on the economy, with the costs falling disproportionately on the poor.

Indonesia is experiencing rapid urbanisation and industrialisation, with about 50 percent of the population (around 120 million people) now living in urban areas. As a consequence, environmental conditions in many city neighbourhoods are in the atrocious state described above. Workable solutions to urban wastewater problems are desperately needed. The Ministry of Public Works, Directorate General for Human Settlements is the agency most responsible for assisting city governments to resolve the wastewater problem. It has invited AusAID, through the Indonesia Infrastructure Initiative (IndII), to help tackle the problem. IndII has been asked to prepare master plans, feasibility studies and detailed engineering designs of wastewater investments, especially sewerage, for larger cities across the country. The first stage of work – preparing an activity design and tender documents for consulting services – began in August 2009 and is scheduled for completion in January 2010.

From Gravity Sewers to Septic Tanks

In the developed world, reticulated gravity sewers (piping that slopes gradually away from the source to carry the water to a central sewage area) are

Crowded living quarters in urban areas exacerbate problems with wastewater disposal.
Courtesy of Andrew McLernon

the standard solution to carrying off wastewater. But they can only be part of the solution in Indonesia – sewerage systems are very expensive to build and operate, especially in crowded and still-developing cities. They require substantial institutional capacity to operate and maintain and have yet to gain acceptance in Indonesia as the best way of tackling the wastewater problem. On the other hand, although there are a variety of cheaper interventions available, such as on-site septic tanks and small reticulated communal systems, sustainable alternatives to conventional sewerage for heavily built-up areas have not yet been widely accepted or proven. Communities are generally more willing to pay for conventional sewerage services, especially in downtown and middle income residential areas.

An integrated set of prioritised sanitation interventions is required, applying different solutions to different parts of the city, and establishing management arrangements that will sustain implementation. Further, a strategy is required to ensure that limited resources are used in a complementary rather than an overlapping fashion. IndII's wastewater activity therefore aims to help a select number of cities plan sanitation and behavioural change interventions, conduct feasibility studies and complete detailed designs. These are precursors to developing infrastructure and changing community behaviour to improve environmental conditions. This in turn will improve health, reduce poverty and increase environmental amenity in and around cities.

Institutional Barriers

The difficulties involved are not to be under-estimated. They include overcoming complex institutional obstacles as well as technical, economic and social challenges. Sewerage systems are not entirely new to Indonesia, but there are just 11 cities with an operating system and for only small parts of each city, with Bandung still using some sewers built in 1916 during the Dutch colonial era. Overall, it is estimated that less than 2 percent of the urban population in those cities is able to dispose of wastewater off-site through the sewerage systems.

On-site treatment using septic tanks, which are generally affordable, is the most common means of disposal, typically covering about 75 percent of people in most cities (the remainder have no access at all to a safe disposal method). But septic tanks are ineffective in areas with a high water table and are just not suitable for dense settlements, where a family living in a 36m^2 house would be considered "well off." Poor construction of septic tanks often causes leakage of waste into groundwater.

Between the sewerage systems and on-site septic tanks extremes there are various off-site treatment options. Which one is the best, most sustainable choice depends on a number of factors. Although these intermediate options are gaining popularity in a growing number of cities, especially on densely populated Java, IndII foresees that cities will need to incorporate all three types of responses – sewerage systems, on-site septic tanks, and off-site treatment options – plus complementary interventions. The choice depends not only on economic and technical criteria (affordability and efficiency), but also on social acceptance and the sustained resolve of city governments to address the wastewater problem.

This resolve is needed because urban sanitation problems cannot be separated from governance and management difficulties, which are particularly severe in urban areas. Social cohesion is low and

A wastewater treatment plant in Karawang, West Java
Courtesy of IndII

people have higher expectations of government service provision than they do in rural areas. The capacity of any local government to commit to and sustain any strategy is hindered by the fast pace of urbanisation and constant shifts in the urban environment. Slums appear almost overnight, housing estates mushroom around the cities' outskirts, inner city areas gentrify, and city finances can barely cover the operating costs of existing infrastructure, let alone make new investments. Further, poorly trained and motivated city government employees, from the multiple agencies nominally responsible for wastewater management, struggle to engage the wide range of stakeholders who must agree to sustainable solutions. Even if agreement is achieved, it remains a daunting task to create policies, manage implementation, and develop compliance mechanisms so progress can be sustained.

Sewerage systems are very expensive to build and operate, especially in crowded and still-developing cities.

A Multi-Faceted Response

IndII's response to this challenging situation is to not only identify technically and economically acceptable solutions appropriate for conditions in each target city, but to address institutional and political economy constraints through strategies that include:

- Clarifying early in the activity the roles of key government actors and their goals, strategic objectives, authority and responsibilities with respect to wastewater management
- Promoting policies of cost recovery, contributions from all beneficiaries, and fulfilment by all government agencies of their obligation to provide public services
- Making use of more autonomous "arms-length" service delivery organisations with a clear mandate and incentives to manage wastewater
- Giving a greater role to the community, and especially to women wherever possible
- Adopting a suite of interventions to ensure that a range of price-quality-service packages are available
- Supporting structural reform in the sector, including inter-jurisdictional and private sector cooperation as appropriate

Historically, many good plans have been created but never fully realised. In planning its wastewater programmes, IndII is being careful to ensure that activities kick off in cities where the likelihood of successful implementation is high. This requires utilising in-depth knowledge of current policies, blueprints and arrangements within the central government; taking advantage of cities' new authority under decentralisation; and building on the emerging willingness to implement performance-based budgeting. It requires building on recent progress that has been made toward institutionalised community participation, strategic sanitation planning, the introduction of minimum service standards, and regulations allowing cities to establish more autonomous service delivery agencies. It requires that IndII assist in developing the current limited set of Indonesian standards in the sector along with the procedures and criteria necessary to coordinate sectoral development. And it requires alignment and harmonisation among the donors supporting the Government.

All in all, managing urban wastewater is a major task. For many, it may be a case of "out of sight, out of mind," but for others it is a complex problem that desperately needs a solution. Wastewater does not just disappear, but hopefully the future holds an encouraging report on how AusAID and IndII are helping Indonesian cities to better manage it. ●

About the author:
Andrew McLernon is an urban development consultant, based in Indonesia, who has worked mainly on World Bank and the Asian Development Bank funded projects advising the Government of Indonesia. He is now consulting with the Indonesia Infrastructure Initiative to develop its wastewater programming. Andrew spent nearly 20 years of his professional career on the engineering design and supervision side of water supply, sanitation and urban infrastructure; but since going back to school in the mid 1990s he has been heavily involved with the policy, institutional development and capacity building side.

Author's Update

Since our article in the January 2010 edition of ***Prakarsa***, IndII has awarded contracts for the preparation of master plans and feasibility studies in eight cities. Mott MacDonald Indonesia Pty Ltd and associated firms are working with the city government in Kota Bogor, Surabaya and Makassar. Sinclair Knight Mertz and associates are working with the governments of Batam, Pekanbaru, Palembang, Bandar Lampung and Cimahi. Work is ongoing, with the first stage of addressing wastewater problems (the preparation of plans and feasibility studies) scheduled for completion in June 2011.

An "oversight consultant" (Hickling Corporation) has also been appointed to assess the consultants' work, to ensure it is linked to national standards and policy frameworks, and to strengthen capacity-building activities.

The cities under the programme were "self-selected" through an objective process in early 2010 based on a set of criteria that included city size, explicit commitment of the city mayor to reform of wastewater institutions, and completion of a detailed questionnaire by senior officials of the city government. Work began in the cities in September 2010 and presently the consultants are discussing drafts of plans and identifying priority activities for the cities.

Conditions in each city (and solutions) of course vary, although common prevailing themes include: exposing and managing the impact of domestic wastewater pollution on community health, the environment and well-being: the need for involving multiple stakeholders to improve governance of the sector; and the design and implementation of planning processes that build the capacity of city governments to manage the sector. ■

KEY POINTS *on Engineering Safer Roads*

Road crashes are a major global health problem, and 90 percent of the deaths are in low and middle income countries like Indonesia. Indonesia is experiencing a road safety crisis that ranks amongst the worst in the world, and road fatalities are climbing. The Indonesia Infrastructure Initiative (IndII) is working closely with Indonesian engineers to improve the situation through engineering safer roads. Australian road safety engineer and IndII consultant Phillip Jordan, and national consultants Jany Agustin and Victor Taufik, are all based in the Directorate General of Highways (DGH) Head Office. Here they are assisting DGH to establish a road safety engineering team and raise the skill level of local engineers in road safety engineering.

The road safety problem consists of three elements: the human, the vehicle and the road. People often believe that the primary solution to road crashes is reducing human error, but this is only part of the picture. The key factor in a successful national push to improve road safety is the prudent use of national resources across all government agencies.

IndII's Road Safety Project has brought to light many high-risk roads throughout the country, each with a wide range of different road users. It is clear that Indonesia will benefit from the establishment of a new road safety engineering team. To begin building such a team, IndII has assisted DGH to conduct training workshops in various cities based along the Eastern Sumatera Corridor and the North Java Corridor (the two busiest and most notoriously dangerous highways in Indonesia). The workshops have demonstrated how to investigate accident "blackspots" – locations where many crashes occur – and how to do a road safety audit that ensures there are no unforeseen safety problems with the design of new roads.

As Indonesia engineers its national highway system, IndII will assist DGH to develop the necessary skills and knowledge to be able to cost-effectively manage this global health issue.

Engineers Learn How to Make Indonesia's Roads Safer

People often assume that drivers are the root cause of all road crashes, but the physical infrastructure of the roadways plays an important role as well. Indonesia's officials are confronting this issue with the help of IndII.

Phillip Jordan

Road crashes are a major global health problem. They kill more than 1.3 million people worldwide each year. More than 260,000 of the dead are young children. Another 50 million people are injured, many so badly they will never work again. When the dead or injured are young breadwinners, their families may be pushed into extreme poverty and hardship. All in all, road crashes now claim more lives globally than malaria. And as with malaria, 90 percent of the deaths are in low and middle income countries like Indonesia.

Indonesia is experiencing a road safety crisis that ranks amongst the worst in the world. The Asian

Participants in an IndII workshop inspect a new by-pass in Bandung before it is opened to traffic.
Courtesy of Phillip Jordan

Development Bank has estimated that crashes cost Indonesia approximately 2.8 percent of GDP annually. Police records suggest that about 12,000 people die on the roads in this country each year, but hospital records and independent research suggest the real figure is over 40,000. The numbers are climbing as more and more people in this vast country are motorising. (Honda reportedly sells 5 million new motorcycles here each year.) If nothing is done, road fatalities in Indonesia are predicted to exceed 50,000 a year within two years.

Against this backdrop, the Indonesia Infrastructure Initiative (IndII) is working closely with Indonesian engineers to improve the situation. In keeping with its infrastructure focus, IndII is directing its efforts towards engineering safer roads. Australian road safety engineer and IndII consultant Phillip Jordan, and national consultants Jany Agustin and Victor Taufik, are all based in the Directorate General of Highways (DGH) Head Office. Here they are assisting DGH to establish a road safety engineering team and raise the skill level of local engineers in road safety engineering. As the first step towards establishing a road safety engineering team, they are training DGH engineers, along with some members of the Traffic Police and the Directorate General of Land Transport (DGLT).

WHAT IS A ROAD SAFETY AUDIT?

Whenever a new road is designed, it should be checked by an independent team of road safety engineers to ensure that there are no unforeseen safety problems in the design. This process is called a road safety audit. It is a proactive process that attempts to save time and money by eliminating any possible safety concern while it is still a line on a drawing, instead of after the road is built. Road safety audits are commonly carried out in most developed countries today but are still new to Indonesia. They have real potential to assist with the construction of safer roads across the country.

Sharing Australian Experience

In 1970, 1061 people died on Victoria's roads. By 2008, this number had been reduced to 303, making Victoria one of the safest road networks in the world measured by its rate of fatalities per registered vehicle. Victoria and New South Wales now have fatality rates on a par with Sweden, the Netherlands, and the United Kingdom – countries that have the world's best road safety statistics. The lessons learned through this experience can and should be used to help local experts in countries such as Indonesia to jump ahead more quickly.

Agency Cooperation Is Key

At its most basic level, the road safety problem consists of three elements: the human, the vehicle and the road. Early attempts in most countries to improve road safety are often directed at one component only. People commonly blame the road user for all safety problems, so early efforts to address them usually focus on driver/rider behaviour, including obeying road rules and wearing seat belts or helmets.

In Indonesia, most people blame motorcyclists for crashes. They add that public awareness of road safety issues must be improved and that police should enforce traffic laws more strictly with respect to motorcyclists. Such campaigns are essential and valuable, but only part of the picture. The key factor in a successful national push to improve road safety is the prudent use of national resources across all government agencies. Road safety is a long term investment in a country. The greatest results will come when agencies coordinate, communicate, and cooperate. Furthermore, Indonesian champions have to be found, nurtured, encouraged and assisted. International consultants can assist, lead, train, encourage and enthuse but eventually the solution lies with local efforts and local institutions.

Some important local efforts are already underway. A number of groups are working to raise public awareness of the safety benefits of motorcycle helmets and seat belts. A new traffic law that introduces a raft of new regulations for road users has just been unveiled. Other promising steps include a major project to improve road crash reporting in Indonesia – an essential move because until a country knows the real extent of a problem, its politicians will not approve the resources needed to address it.

But the country still awaits the start-up of a National Road Safety Council, and the prepa-

Prakarsa Compendium

ration of a National Road Safety Strategy to provide guidance and overall direction. Only with such national guidance, coordination and cooperation will national resources be put to most effective use.

Under IndII guidance, teams from DGH/Police/DGLT inspected and analysed the case study sites, preparing reports that received feedback from IndII personnel. The workshops also included audits of drawings for seven new road projects, highlighting the safety features and flaws of designs now in the planning stages.

At its most basic level, the road safety problem consists of three elements: the human, the vehicle and the road.

Safer Highways Are a Good Start

IndII's resources are contributing to a goal that offers major benefits but which is often considered too long term and too hard: making national highways safer. IndII's Road Safety Project has brought to light many high-risk roads throughout the country, each with a wide range of different road users. It is clear that Indonesia will benefit from the establishment of a new road safety engineering team that can lead the development of safer roads across the country.

To begin building such a team, IndII has assisted DGH to conduct seven major training workshops in various cities based along the Eastern Sumatera Corridor and the North Java Corridor (the two busiest and most notoriously dangerous highways in Indonesia). The workshops have demonstrated how to investigate accident "blackspots" and how to do a road safety audit (see boxes). Indonesia has many blackspots, and treating these with low cost countermeasures is a very effective way to reduce crashes.

Each workshop has included local case studies, along with inspections of several blackspots.

Workshop presentations have stressed to engineers that they all have a role to play in reducing road crashes. Engineers must not simply blame the drivers. They have to engineer roads that are understandable to road users and that are forgiving when drivers make a mistake.

A forgiving roadside is one that ensures that injuries to anyone unfortunate enough to run off the road are minimised; it does not have large rigid poles or deep drains beside the road. The forgiving roadside is a new concept in Indonesia and it will take a concerted effort by many professionals to encourage its wholehearted adoption.

A Continuing Effort

IndII will continue to help Indonesia to expand its road safety efforts. As the country engineers its national highway system, it will offer additional input on safety considerations. IndII will assist DGH to develop the necessary skills and knowledge to be able to cost-effectively manage this global health issue.

MAKING BLACKSPOTS BETTER

A "blackspot" is a location on the road that has a high number of crashes. It might be an intersection, or it might be a curve on the highway. It is known for its crash frequency and usually also for its crash severity.

Engineers can effectively treat blackspots with low cost countermeasures to reduce the number and/ or the severity of these crashes. Better signage, renewed line marking, removal of a roadside hazard, and use of reflective plastic cones to delineate worksites can all help. For example, a curve on a highway that is experiencing a number of run-off-road crashes may be treated with shoulder sealing, edge lines and chevron markers around the curve. These countermeasures help to keep vehicles where they belong and studies show that they can reduce crashes by about 50 percent. The economic returns from treating blackspots are great, with overall returns on money spent of more than four to one.

For a country with 230 million people, Indonesia has relatively few traffic engineers and even fewer road safety engineers. IndII is committed to helping the government face this challenge and bring the country up to world standards with specialist teams striving to ensure that the number and severity of road crashes are set on a continuously downward trend. •

International consultants can assist, lead, train, encourage and enthuse, but eventually the solution lies with local efforts and local institutions.

Author's Update

Throughout 2010, the Road Safety Engineering Unit at DGH launched a new round of training workshops, blackspot investigations, and road safety audits. Working with local officials along the Eastern Sumatera Highway and the North Java Corridor, the RSEU led a number of interesting investigations. During this time, the ongoing problem of road safety at road work sites was tackled through the preparation of a small information booklet and the presentation of two training workshops (in Denpasar and Makassar). These workshops were directed at contractors involved in major road work projects in eastern Indonesia, and they received very favourable reviews. The highlight of each workshop was a "game" – prepared by RSEU engineer Victor Taufik – in which the attendees used scaled-down

Participants in an IndII workshop on road safety in Palembang came across this bus crash, where an apparent steering failure led to the bus running off the road and rolling over. One person in the bus was killed. *Courtesy of Phillip Jordan*

signs placed along a drawing of the road work site. It was fascinating to watch as engineers/contractors became greatly engaged in the exercise, arguing about the placement of small paper signs as they learned the principles of safer road works.

Two other activities commenced in mid-2010. In the first, Road Safety International, Inc. (a road safety training consultancy) was engaged to prepare three road safety engineering manuals and matching DVDs on topics relevant to the present state of Indonesian road safety engineering – Road Work Safety, Roadside Hazard Management, and Road Safety Engineering (blackspots and audits). The manuals and DVDs are nearing completion and will form the backbone of a series of technical training resources for use by DGH and other engineers.

In the second activity, a team from VicRoads International was engaged to complete a number of road safety audits and blackspot investigations. This project is nearing completion and will include designs for the agreed countermeasures at each blackspot. The audits will assist the project teams to develop safer finished road projects.

Also in 2010, a successful fact-finding mission sent Indonesian delegates to Melbourne, Australia to visit VicRoads, intersections, blackspots, and factories that produce road safety supplies. At this writing, a second mission is scheduled. It is anticipated that this annual event will continue to expand as the bond between Indonesia and Australia in road safety engineering grows. ■

About the author:
Australian road safety expert **Phillip Jordan** draws on his experience in Victoria going back to the 1970s, when he began work as an engineer with the Road Safety and Traffic Authority (since amalgamated with other government agencies to become VicRoads). Having worked in more than 20 countries as varied as Albania, Azerbaijan, Britain, Eritrea, Iran, India, Australia, Singapore, Canada and Thailand, Phil is able to see the differences and also the similarities of the road safety situation across the world. He sees great scope for Indonesian engineers to take a lead in designing and managing safer roads for all Indonesian road users.

Infrastructure by the Numbers

31%

The proportion of Indonesia's urban households that now have a water connection, down from 39 percent in the 1990s.

44.5%

The average effective working time as a proportion of turnaround time for ships at Indonesia's main ports. This suggests that ships are spending over half their time in port sitting idle at berth or waiting in queue.

0.37%

The typical amount of surplus revenue that local governments annually invest in their water companies, according to data from a 2007 audit by the Ministry of Finance.

2

The rank of radio communications license fees for use of a public resource, as a source of non-tax revenue for the Government of Indonesia. The oil and gas sector is number 1.

65%

The proportion of traffic fatalities in Indonesia that are motorcyclists. Another 15 percent are pedestrians.

The Expert View

The Question: "What do you think should be the highest priorities of the incoming administration for infrastructure development?"

Ir. Taufik Widjoyono, M.Sc.
Head of Planning Office, Ministry of Public Works

"Among our top priorities for future road development should be, first of all, efforts to maintain roads that are now in good condition. Second, it is necessary to improve roads in less developed regions, in order to increase their accessibility. Third is the need to increase mobility in more developed areas. Finally and no less important, all management of road infrastructure should take into account safety considerations.

Infrastructure development should be an important part of enhancing regional productivity, in coordination with local geography and natural resources, oriented toward increasing prosperity. Achieving this goal will require a number of elements: effective management, leadership, institutional capacity, and coordination with spatial planning. These are important determinants in bringing about reliable infrastructure.

Transport and telecommunications infrastructure should unite regions along with infrastructure for water resources, energy and housing – all aimed at economic growth and building a country that is safe, secure, productive and sustainable."

Prof. Dr. Danang Parikesit
Professor of Transportation, University of Gajah Mada
Chairperson, Indonesia Transport Society
Policy Adviser to the Minister of Public Works

"A difficult question indeed! Infrastructure serves as a foundation for equitable growth, and we have an urgent need not only to improve access to all types of infrastructure, but to achieve a quality comparable to our neighbouring ASEAN countries, China and India. Transport and electricity are perhaps the utmost priority for policy intervention, but clean water and sanitation have long been neglected infrastructure sectors."

Adriansyah
Director for Regional Financing and Capacity
Directorate General of Fiscal Balance, Ministry of Finance

"People's basic needs should be the top priority in the future development of infrastructure. Provision of clean water and roads are two concrete examples of people's basic needs, especially for those who live in less developed regions. It is the government's responsibility to meet these needs as mandated by the Constitution of 1945. Implementation of basic needs provision can be conducted directly by the government or through state-owned or local government-owned companies. Thus, technical ministries must ensure that basic needs provision is treated as the top priority in their long term as well as short-term development planning."

Railway Revitalisation

April, 2010

KEY POINTS *on Technology for Railway Revitalisation*

Technological modernisation has a crucial role to play in the revitalisation of Indonesia's railways, as highlighted by a consultant team from IndII that is assisting the Directorate General of Railways to develop the new National Railways Master Plan.

Incremental improvements to passenger service on the Jakarta-Surabaya mainline over time will yield the greatest benefit per rupiah spent. Improvements can start with better track maintenance, installing modern signalling and traffic control systems, and installing cross-traffic protections, allowing for faster travel.

Further improvements include increasing the bearing capacity of the infrastructure and improving vertical and side clearances. Such improvements will allow the introduction of more powerful locomotives that can carry longer trains at higher speeds, permitting the use of modern bi-level passenger coaches – lowering average costs and speeding up services.

These essential improvements to passenger service will create potential economies of scope that could lower the costs of rail freight services and help spark a revival of rail freight services on Java, for example by allowing the introduction of specialised low-well wagons for double-stacking of containers.

For many shippers, quality of service factors – including degree of control over shipments, dependability, and logistics support – are at least equally important to price. If rail offers quality in all these dimensions it can ultimately impact decisions on where large-scale manufacturing industries locate.

Rail is not a panacea for Indonesia's problems with road congestion and deterioration. While it has a role to play, on Java it is likely to be confined to niche markets.

On Sumatera and Kalimantan, railways will have a vastly larger role in carriage of coal to the ports. Railways on Sumatera need to be expanded and upgraded to international heavy-haul standards, while new railways to be built on Kalimantan will permit exploitation of higher quality coal deposits further inland.

Industrial policy should support the development of an Indonesian railway components manufacturing industry that meets current international standards and stays abreast of continuing technological innovations.

If GDP growth of 7 percent is sustained, population continues to increase, and population density trends continue, there may be a future role for Very High Speed Rail. Planners should take the necessary steps now to identify right-of-ways and preserve land in preparation for this.

Better Technology for Better Railways

Technological enhancements should form an integral part of Indonesia's railway revitalisation efforts. Substantial economic and social benefits can be reaped from incremental changes that will permit faster travel for passengers and better service for shippers.

Clell Harral

"In many respects PT Kereta Api Indonesia operates a very well run railway, given the constraints that it faces." Those were the words of John Winner, member of a consultant team formed by the Indonesia Infrastructure Initiative (IndII) to support the Directorate General of Railways (DGR) as it finalises the National Railway Master Plan (NRMP) mandated under Law no. 23/2007. Winner, who heads the global railways practice at Harral Winner Thompson Sharp Klein (a US-based management consulting firm specialising in transportation), made his remarks following the IndII team's[1] four-day inspection tour along Java's mainline in November 2009, accompanied by locomotive drivers and officials from national railway operator PT Kereta Api Indonesia (PT KAI).

Winner observed, "Given the vintage technologies still employed in many elements of Indonesia's railway system, it is surprising that it is doing as well as it is today. The railway staff are generally well disciplined, and are achieving important transport services operating with what is in many respects obsolete equipment and infrastructure. Strong efforts are also being made to maintain all the assets that can be maintained, including quite a few that are well beyond their normal economic life."

Locomotives parked at the depot in Bandung
Courtesy of Harral Winner Thompson Sharp Klein

With those remarks, Winner emphasised a key issue for planners who hope to revitalise Indonesia's railways: the need to modernise technology. As the inspection tour highlighted, a number of concerns related to outmoded or inadequate technology must be addressed by the NRMP.

Institutional Failure

One problem relates to the absence of an adequate inventory of spare parts that would speed up the process of overhauling and repairing locomotives. At UPT [*Unit Pelaksana Teknis*] Balai Yasa Yogyakarta, the team inspected PT KAI's main locomotive workshop and spoke with the facility's head, John Robertho. As he explained, a locomotive overhaul now takes on average 30 days. This entails stripping out, inspecting, refurbishing or replacing, and reassembling the locomotive's main components. A similar process occurs if locomotives in the field need repairs: parts are removed, shipped to the Yogyakarta workshop, repaired or replaced, and sent back. Locomotives – the single most expensive piece of equipment used by the railway – sit idle throughout this process, leading to reduced annual carrying capacity and necessitating investment in a larger fleet, raising overall operating costs. A modern shop operation would draw on local or regional inventories of spare parts for immediate unit exchanges, cutting the time for an overhaul to 7–10 days. Old parts could then be repaired and refurbished without delaying the return of the locomotives to service.

In 1997, the World Bank Railway Efficiency Project provided an initial inventory of spare parts for this exact reason. It worked well at first, but the initial inventory of spares was soon used up and has yet to be replaced. This may be partly because the severe economic downturn in 1997 caused a decline in PT KAI traffic, reducing the demand for locomotives and decreasing the urgency of maintaining the inventory. But once railway traffic began to grow again and every locomotive was needed, the slow turnaround at Yogyakarta became a binding and increasingly costly constraint, which needs to be addressed without further delay. As a technical matter, this problem is well recognised. The solution has been identified and agreed upon; it is an *institutional failure* that the solution is known, but has not been funded or implemented.

Greater Speed in the Short Run

The northern coastal line connecting Surabaya, Semarang and Cirebon to Jakarta offers more opportunities for improvement. Inspection revealed that this track is generally well aligned. But with relatively modest investments, the track could be capable of supporting speeds of up to 120–125 kilometres per hour, up from the current 90–95kph. This could be achieved by: (a) improving the quality of track maintenance; (b) installation of modern signalling and traffic control systems; and (c) installation of cross-traffic protections on the many unstaffed and un-signalled level grade crossings. These measures alone would enhance the capacity of the existing line (which is mostly single track between Cirebon and Surabaya), possibly by enough to postpone double-tracking for some years. The increased speed and reduced travel time would also enhance the competitiveness of the railway vis-à-vis other modes, particularly against road transport for intermediate destinations between city pairs within the corridor.

For lengthier trips, such as between Surabaya and Jakarta, the improved travel time from these measures alone would probably not be enough to divert airline passengers to train. However, instituting an overnight sleeper service between Indonesia's two largest cities might be a strategic approach. In China, overnight sleeper trains between Beijing and Shanghai city centres have been highly successful.

Medium Term Improvements

Two further levels of improvement in the same Jakarta-Surabaya corridor could be considered. The next level up in terms of both service levels and costs involves: (a) doing some modest spot improvements to take out the worst wriggles in the track alignments; (b) introducing more powerful 4-axle locomotives to move faster trains; (c) enhancing track strength to support the 23–25 tonne axle loads imposed by these locomotives; and (d) raising structural clearances to permit the introduction of modern bi-level passenger coaches[2]. With these improvements it would be possible to offer services with a maximum speed of 150kph, and it should not be necessary to change to a wider gauge[3] to achieve this advance. Such service levels would pose serious competition to bus operators and would even divert some travel by private car.

Moreover, such investments, while driven primarily by the demand to enhance railway passenger service, will also improve the potential to provide new freight services.

Economies of Scope

The concept of "economies of scope," which applies when the average total cost of production will decrease when the number of different goods produced is increased, is very applicable to proposed investments in Indonesia's rail system. When track and locomotive enhancements are coupled with investments in modern railway freight wagons with higher payloads, and specialised low-well wagons permitting double-stacking of containers, any freight that typically moves in large point-to-point volumes could then potentially move more economically by railway.

Enhanced rail services could serve major manufacturers in important markets (e.g. automobile carriers from assembly plants in West Java to the Surabaya market), or connections between other load centres, such as port to inland "dry ports" for customs formalities, or containers between Tanjung Perak, Semarang, Cirebon, and other large northern coastal shipping centres.

It's Not Just About Price

However, as shipper surveys in Indonesia and other countries have revealed, shippers are typically concerned more with their degree of control over their shipments, the dependability of delivery schedules, and logistics support functions than they are with the direct cost paid for the specific haulage function. To attract freight from the highways onto the railways, any rail service provider will need to offer competitive service characteristics in all the dimensions valued by shippers and demonstrate their reliability. If sustained over time, this would affect decisions on where large-scale factories were built, as businesses would choose locations that could take advantage of the lower costs of much improved railway services to move their products.

Given the easy accessibility of heavy industries to water transport and the spatially dispersed pattern of much other manufacturing and agriculture on Java, it must be recognised that at least initially, and possibly for the longer run, railway freight services on Java will most likely be confined to a niche – potentially an increasingly profitable niche for railway operators, whether for PT KAI or other operators. Put another way, proper management of the railway system will lead to a significant revival of railway freight services on Java, but this will not bring great relief to the growing congestion on Java's highway networks, nor will it eliminate the need for investment in more arterial highways.

Coal Is Another Story

The prospects for railways on Sumatera and Kalimantan are of an entirely different character and magnitude. Buoyant international markets for coal are leading mining companies to propose major investments to expand existing mining operations on both islands, and, particularly in Kalimantan, to open extensive new deposits much further inland. Mining companies see railways as the mode of choice to access these new developments. Here there is no doubt that modern heavy-haul railway technologies are the right choice, with at least 25-tonne design axle loads permitting higher payloads, and fast loading/discharging wagon designs, powered by high-horsepower multiple unit diesel-electric locomotives tied together to pull long trains of 7000 tonnes or more.

However, due to apparent conflicts between various Indonesian laws, any specific Special Purpose Railway concession that is identified in the NRMP would be required by law to be publicly tendered, which could drive away private sector interests. Consequently, IndII's consulting team is not including recommendations regarding particular special purpose railway concessions in the various Working Papers being prepared to support finalisation of the NRMP. They will, however, address the technology issues that the DGR should be building into technology standards for new railway lines.

The Role of Industrial Policy

Industrial policy has a role to play in supporting the development and indigenisation of the railway supply manufacturing industries in Indonesia. This promises to be a revitalised and growing industry and it is highly desirable that Indonesian manufacturers are prepared to pursue their opportunities within it. Care should be taken to ensure that modern technologies and standards, consistent with international standards established either by the Union Internationale des Chemins de Fer or the Association of American Railroads, are adopted – and promptly adapted as new technologies and standards are developed over time. Some technologies still being manufactured in Indonesia (e.g. semaphore mechanical signalling) have been obsolete for decades, and should be replaced as soon as possible. Some standards voiced at a recent manufacturer's conference in Bogor fell short of international best practice in railway standards. Public policy makers should seek the development of an internationally competitive railway manufacturing industry, not a sheltered industry producing outmoded technologies.

A close-up of the controls on a modern PT KAI locomotive
Courtesy of Harral Winner Thompson Sharp Klein

A Vision for the Long Run

Over the longer term, if Indonesian income growth can be sustained above 7 percent per annum, GDP will double in 10 years and quadruple by 2030. Such income levels, and the density of population, would likely then support the development of Very High Speed Trains travelling in excess of 250kph along the Jakarta–Surabaya corridor. This development would require entirely new infrastructure on a separate alignment. Prudent planning suggests that steps should be taken now in order to prepare: the most appropriate right-of-ways should be identified and a programme to set aside the land needed for such developments should be undertaken.

Technological upgrades alone will not lead to a thriving and competitive rail system in Indonesia. But combined with the right policies and planning, they form an important part of the vision for revitalised Indonesian railways. •

NOTES

1. Other participants in the inspection tour included the author and seconded staff from the Ministry of Transport, Vonny Mahendri and Andi Ditjenka.

2. Where future traffic growth is robust, as probably on all of the Jabodetabek lines and very possibly on the Jakarta-Surabaya line, improvements to enhance vertical and side clearances and infrastructure load-bearing capacity to accommodate modern bi-level passenger cars should be started now.

3. Railway gauge is the distance between the inner sides of the two rails that together make up a single railway track.

About the author:

Clell Harral is Chairman of HWTSK and project manager for IndII's support to MoT for finalisation of the National Railway Master Plan. In a career of 22 years with the World Bank, he served successively as chief of transportation research, transport policy adviser, principal transport economist for the Asia region, and lead manager for its China transport programme. For 17 years he directed the international team that developed the HDM model for highway planning. In 1991, he was chosen to lead the transportation practice of the newly established European Bank for Reconstruction and Development. Formerly a Visiting Scholar at Harvard University, he is coauthor of *Moving to Market: Restructuring Transport in the Former Soviet Union* (Harvard University Press, 1996) and many other publications. Mr. Clell holds a Ph.D. in economics from the University of Rochester, where he worked with Nobel Prize winner Robert Fogel on the classic study *Railroads and American Economic Growth.*

Author's Update

There has been lively debate since the publication of this article, along with some positive developments. Much of the debate concerns investment strategy and structural changes. The investment strategy changes we suggested argue for transforming the nature of the governments' investment in infrastructure to begin building a modern railway rather than continue spending on outdated legacy technologies. The suggested structural changes call for greater transparency in funding rail infrastructure spending, including at a minimum clear accounting separation of PT KAI's activities for infrastructure maintenance, operation, and renewal activities. Our recommendations called for the formation of a separate company or PT KAI subsidiary to carry out those infrastructure maintenance and operations activities. We believe that this would allow PT KAI to focus more closely on providing transportation services for passengers and freight.

Along these same lines, we recommended a more complete separation of PT KAI's Jabodetabek (Jakarta-Bogor-Depok-Tangerang-Bekasi) subsidiary so that it can seek different financing sources and pursue faster development of commuter services in the Jakarta region in conjunction with local and national government groups. Finally, we also recommended policy changes that would encourage greater private investment in railway infrastructure and allow private infrastructure and private rail operators to more easily integrate with the national rail network. These included:

- Further elaboration of TAC (track access charges), IMO (infrastructure maintenance and operation) and PSO (public service obligation) policy, as required by Law 23/2007
- Development of a streamlined dispute resolution capacity within MOT to address conflicts that may arise with regard to the above, licensing, certifications and related matters
- A number of policy recommendations to provide national guidance for Provincial, regency and municipal railway infrastructure and train services PPPs

Our investment strategy proposed incremental technical upgrading to general purpose, heavy duty national routes, with supplemental national standards for interoperability and financial sustainability to guide private mining and public/PPP urban transit lines. These key recommendations include:

- Stronger infrastructure capable of higher axle loads – this is the highest priority.
- Higher horsepower and higher tractive effort 4-axle locomotives to exploit the economies of the stronger infrastructure by moving heavier trains faster, thereby increasing network capacity and improving service quality.
- Larger clearance envelopes to permit the use of multi-level passenger rolling stock and economic container trains.
- Replacing existing obsolete signal and traffic control systems. Since our work was published, Indonesia has experienced several major train accidents related to obsolete signal and traffic control infrastructure.

Indonesia continues to invest almost USD 400 million each year in adding additional tracks, bridges, and replacing worn out infrastructure. The incremental cost of increasing the strength of these new assets is minimal. It is our understanding that the DGR is considering these recommendations and will incorporate them into its investment plans over time. It should be recognised that railway infrastructure engineering and procurement generally takes several years and can't be implemented within a few months.

The private sector demand for special purpose cargo railways remains strong. The national government is now making serious efforts to create a regulatory structure that facilitates construction of new "special purpose" lines. A number of special purpose and general purpose private railway investments have been proposed in recent years and several await licensing at various levels of government.

While the final outcome of these projects is not yet known, they demonstrate the willingness of investors to meet much of Indonesia's need for modern railways. The Ministry of Transport is actively working to clarify regulations to encourage private investment and allow integration of private railways with the national network.

Still unresolved is finding a way to solve the intra-government disputes about existing rail infrastructure ownership so that private investors can upgrade existing rail lines without having to build parallel "special railways". Also still unresolved is the separation of Jabodetabek from PT KAI so that investment can flow into this and then other commuter rail systems. ■

KEY POINTS *on Conducting a Market Assessment*

A sound assessment of the market for rail transport in Indonesia is essential not only for the viability of rail itself, but also to ensure that the entire national transport system is developed in such a way that each mode performs the tasks for which it is best suited.

Indonesian officials are in the process of developing an ambitious Railway Master Plan, so now is the time to determine the right approach to the market assessment.

Rail is well suited for hauling large volumes (typically in excess of 5 million tonnes/year) of general or bulk freight over long distances and moving large numbers of passengers and commuters.

Preliminary analyses indicate that many services provided by rail are not in line with its comparative strength. Rail is carrying some freight for which it clearly is not the lowest cost mode, while in Kalimantan some coal carried by road could be carried more economically by rail.

The approach to the market assessment should be based on certain key principles but needs to be tailored to different freight and passenger services.

The assessment should focus on the comparative costs of each mode for different tasks, because demand cannot be assessed without considering price, and it is not possible to consider price without knowing the cost.

The assessment must recognise that rail and road are increasingly complementary and that rail can only achieve its full potential through investments and arrangements that facilitate intermodal transport. This is particularly relevant for suburban rail passenger services and freight services that require pick-up and delivery by road.

The assessment must take into account the quality of the services provided by the other modes. This is particularly relevant when purchasers of transport, such as long distance passengers and buyers of general freight services, can choose between rail and other transport modes.

The assessment must factor in the impact of changes in government taxation, subsidy, pricing and regulatory policies which now tend to favour road over rail.

Thus, to avoid making investments in services that have no prospect of covering their operating costs, an individualised approach is needed as opposed to an approach based on growth in total demand combined with a market share assumption.

Keys to Conducting a Market Assessment

No single approach will result in a sound market assessment for all dimensions of Indonesia's rail transport system. Different transport tasks call for different kinds of analysis.

Joris Van der Ven

The main purpose of a market assessment is to provide a foundation for investment decisions and to ensure the success of a business venture. When that venture is a national rail transport system, the assessment is critical on two counts. The costly and long lasting investments involved will not only affect the viability of the rail business, but will also impact the efficiency and cost of the nation's entire transport system.

This means that at the very outset the role of rail within the broader national transport system needs to be clarified. In particular, the assessment should identify the tasks that rail can perform at lower cost than other modes of transport, so that when the rail sector is developed to perform these tasks it contributes to lowering costs of the entire transport system. This is crucial for Indonesia, which compared to some of its peers remains

Cirebon Express passengers on the platform
Courtesy of Sakurai Midori

a high cost economy. As Indonesian officials develop an ambitious Railway Master Plan, now is the time to determine the right approach for the railway market assessment; this assessment will provide strategic guidance for the investment components of the Plan.

Rail is well suited to certain transport tasks, such as hauling large volumes of cargo over long distances, moving large numbers of passengers over medium distances, and transporting commuters in major cities. With the advent and spread of road transport, the role of rail has evolved as the location patterns of industries, activities and settlements have fundamentally changed. Thus, before undertaking a major investment programme the strengths of rail for these tasks needs to be evaluated in greater detail.

Unfortunately, prices charged for services by the different modes do not give a straightforward answer to the question of their relative strengths because the modes are not competing on equal terms. Prices are affected by taxation, subsidy and pricing policies that favour one mode over another. However, a workable indication of the comparative strengths of the modes can be obtained indirectly from: (a) an analysis of the performance of the different modes, duly adjusted for the impact of these policies on prices, supply and demand; and (b) a scenario analysis using representative investment and operating costs.

With the advent and spread of road transport, the role of rail has evolved as the location patterns of industries, activities and settlements have fundamentally changed.

Rail Versus Road

A scenario analysis indicates that at least 5 million tonnes/year of general freight are required for a new rail line to be competitive with a new road when the hauling distance is 500 km and there are no pick-up and delivery costs at origin and destination. When such costs are incurred, road remains a lower cost alternative for volumes well in excess of 5 million tonnes/year. If the hauling distance is 250 km and pick-up and delivery costs are involved, which is typical for freight movements in Java, rail is hardly competitive with road even at volumes on the order of 10 million tonnes. When there is an existing road connection between the origin and destination, the advantage of road is further enhanced.

These conclusions are supported by a review of the past performance of rail. General cargo (excluding the South Sumatera coal traffic) has suffered a 2 percent annual decline in tonnes/km since 1996, despite the fact that revenues per tonne/km are now well below operating costs. If tariffs had been raised to cover costs, the decline in traffic would have been more dramatic. These findings suggest that rail is presently carrying cargo for which it is not the lowest cost mode.

At the same time, the potential volumes of coal transported by rail in Kalimantan are in excess of 10 million tonnes/year, indicating that some coal is being carried by road in Kalimantan when rail would be lower cost.

Performance of rail with respect to passenger traffic also suggests that the mix of services provided by rail is not in line with its comparative strength. Annual growth in total passenger traffic over the past 25 years, at about 4 percent, is below that in other modes, indicating a continuing loss in market share. Furthermore, this average masks significant differences between services, with only executive class performing well in terms of traffic and profitability.

These findings have far-reaching implications for the approach to Master Plan preparation, as can be illustrated through the four main transport tasks performed by the national rail company PT

Kereta Api Indonesia (PT KAI). These tasks are Java main line passenger services (long distance services), Java freight services, Jabotabek passenger services, and South Sumatera coal traffic, which together accounted for 90 percent of rail revenues in 2008.

Java Passengers and Freight

The market assessment for Java main line passenger services and Java freight services, which accounted for 53 percent of rail revenues in 2008, is the most challenging as it involves several key dimensions. First, careful traffic costing (the analysis of costs incurred between specific points of origin and destination) is needed to clarify the proper role of rail in these market segments. This should provide an understanding of the commercial viability of services and the basis for "exit strategies" for services that fail to cover operating costs. Clearly, it is essential at the outset to avoid making investments in loss-making services.

Second, the market assessment will have to make assumptions about the transport sector policies that will be adopted in the future. These may include government policies designed to level the playing field between the modes, or to adjust for the fact that rail transport is more environmentally friendly than road transport. On balance, current taxation, subsidy, pricing and investment policies tend to favour road over rail. Therefore, depending on policy shifts, the outlook for rail could be significantly improved.

Third, the market assessment must take into account that price is not the only factor of interest to buyers of transport services. Other important concerns, collectively referred to as "quality of service," are total time in transit, frequency of service, punctuality, and incidence of loss/breakage (for cargo) and comfort (for passengers).

In light of these factors, and the relatively small share of rail in the Java main line passenger and freight markets, a "micro approach" is recommended for the market assessment. In contrast to a "macro approach" – which relies on projections of total transport demand and assumptions on the market share of rail and other transport modes – the micro approach focuses on individual services and clients. The emphasis is on the factors that drive demand: the relative prices and quality of service of competing modes, elasticity measures, and understanding past shifts in demand. Considering that PT KAI has built up a good knowledge of the markets in which it is operating and has the data needed for traffic costing, it should play a key role in this part of Master Plan preparation. For Java economy passenger services there is an additional requirement for a credible market assessment. Since these services are subsidised, the assessment should be predicated on a stable agreement between the government and the train operator regarding the level of subsidy and the related implementation arrangements.

The approach outlined above should not be viewed as a one-off exercise resulting in market parameters that will be valid for a 20-year Master Plan period. Rather it should be considered as a process of constantly improving the product mix of the railway sector. This mix should increasingly conform to the inherent strengths of rail and evolving requirements in transport markets, while adjusting to government policies.

Jabotabek Passenger Services

For Jakarta-Bogor-Tangerang-Bekasi (Jabotabek) passenger services, the approach to market assessment is quite different, as these are suburban commuter services that should form part of an integrated and complementary multi-

General cargo (excluding the South Sumatera coal traffic) has suffered a 2 percent annual decline in tonnes/km since 1996, despite the fact that revenues per tonne/km are now well below operating costs.

Snacks are offered along the Argo-Bromo-Anggrek route on Java. Such "quality of service" concerns are just as important as price to many passengers. *Courtesy of Sakurai Midori*

Boarding the train
on a rainy day in Bandung.
Courtesy of Ikhlasul Amal

modal metropolitan transport system. The best approach therefore consists of identifying the proper role of suburban rail in the overall metropolitan transportation system, based on the relative strengths and costs of the different modes. Fortunately, the basic planning work at pre-feasibility level has already been done as part of the 2004 *Study on Integrated Transportation Master Plan for Jabodetabek*, which contains detailed recommendations on investments and institutional requirements and measures for Jabotabek in combination with Depok.

For the long term, land use and transport planning must be integrated so as to fully exploit the potential of suburban commuter rail services in the Jabotabek metropolitan transportation system. This involves, among other things, a transit-orientated urban/suburban development strategy that is based on the concept of accessibility and promotes public transport. Such a strategy underlies the Jabodetabek Master Plan Study, which under its rail component developed recommendations for improving the quality of rail services, upgrading the railway stations and intermodal connections, and promoting high density real estate development in the vicinity of railway stations.

South Sumatera Rail

For the South Sumatera rail system, the approach to market assessment follows from the nature of the cargo. The line is essentially a coal mining railway with only one major shipper. It carries volumes – more than 10 million tonnes/year – for which rail is clearly superior to road. The off-take agreements of the mining company with its clients (which set out the quantities of coal the mining company will supply over a given period) constitute the essence of the market assessment. The objective should be, therefore, to firm up long term transport agreements with the mining company that mirror these off-take agreements.

New Railway Lines

Beyond the four major transport tasks above, the issue of market assessment is also relevant for planning new mining railway lines, such as for coal transport out of Kalimantan. Given the volumes currently being mined mainly in East and South Kalimantan – in the range of 200 million tonnes/year – and the prospects for further increases in output, there is no doubt that rail has a role to play. The approach to market assessment derives from different circumstances and should be predicated on three principles. First, transport is an integral part of any mining scheme (the mining permit includes the transport permit) and it should be included in the feasibility analysis of the mining investment. Second, rail transport will generally be only one element of a logistics chain from the mine head to the coastal or off-shore loading point. This logistics chain may comprise a combination of road, river, rail and barge transport as well as related transshipment facilities. And third, the mining company or the mining interests should be fully responsible for identifying the least-cost logistics chain and for its subsequent development, financing and operation.

For new coal rail lines to be developed and financed by the private sector, or under a Public Private Partnership (PPP) when cooperation between mining companies is required, the market assessment is therefore essentially a question of determining whether the proposals are economically, financially and environmentally sound and merit the full support of the various government departments responsible for providing approvals and clearances.

In conclusion, the tools and methodologies that must be applied in order to undertake a sound market assessment vary depending on the nature of the transport task. When the markets for rail are assessed with an individualised approach, the result will offer the best possible strategic guidance as Indonesia works to revitalise its railways. •

About the author:

Joris Van der Ven is a transport and PPP consultant who has been active in research, the private sector and development banking. He has worked on a wide range of subjects, including: demand forecasting, managing the various stages of the project cycle, analysing expenditure programme issues and recommending on transport policy. In the 1960s, Joris anticipated that for the rail business to prosper in a competitive transport market it would have to adopt a more commercial orientation and, among other steps, engage in product and price differentiation. This led him to writing his dissertation on the appropriate cost concept for minimum pricing of rail services, a topic still very relevant today. Joris has worked intermittently on the Indonesian transport sector for over 20 years, initially at the World Bank and later as a consultant.

KEY POINTS *on Creating a Railway Renaissance*

Improvements to Indonesia's inefficient transportation infrastructure are essential to future economic growth. Recent changes to the legal and regulatory framework provide opportunities to create a more efficient transport system.

Road now dominates Indonesia's transport networks, carrying the most cargo and passengers. This is due in part to genuine cost advantages but also due to subsidy and tax policies that favour road over rail.

A revitalised railway system can form the foundation of an economically sound, multi-modal Indonesian transport system. Rail has the potential to be cost-effective and is also attractive from an environmental standpoint.

GoI established a national coordination team to formulate a policy framework and actions needed to revitalise Indonesia's railways. The team recommended policy actions covering sector revitalisation, the institutional setting, corporate restructuring, and capacity building/human resources, along with the execution of selected quick-win projects.

Road costs are rising due to deterioration and congestion, creating a high cost economy that reduces Indonesian competitiveness.

A key recommendation is the establishment of separate entities to operate rail infrastructure and rolling stock. This idea has not been moved forward by the DGR, the state-owned railway operator, or the Ministry for State-Owned Enterprises.

An interim solution that would help to move toward the goal of vertical separation is to establish a performance-based contract between the incumbent operator and the government. Under its terms, the operator is granted the exclusive right to run the infrastructure business, but access must be granted for new rolling stock companies to utilise the railway infrastructure.

Urban rail services deserve equal attention from policy makers. Now is the time to lay the foundation for a railway renaissance.

Setting the Stage for a Railway Renaissance

Current transport systems in Indonesia are dominated by road, but an efficient and environmentally sound transport system for the future will rely more heavily on rail. Policy makers must take the proper steps now to make this happen.

Suyono Dikun

Under the current administration of President Susilo Bambang Yudhoyono, Indonesia is now entering its second five-year development stage. From 2010 to 2014, the economy is projected to grow consistently at an average annual rate of about 7 percent. Transportation infrastructure plays a critical role in making this growth possible, by supporting investment and facilitating exports.

Failure to develop the needed infrastructure will have a detrimental impact on the economy and Indonesia's global competitiveness.

Thus, the Government of Indonesia (GoI) faces a huge challenge. The current Indonesian transport sector is highly inefficient. For example, about 12.9 percent of the nation's 34,629 km national

Tegal Arum Pass at Cakung, East Jakarta
Courtesy of Badia Harrison

road network was in unstable condition in 2009. The proportion of damaged provincial and kabupaten roads is much higher, with 50 to 60 percent of these roads judged likely to be in poor or very poor condition. Studies indicate that Indonesia's ports are extremely inefficient and port access is insufficient. Rail transport is also in poor shape, with a share of only about 7 percent of the passenger market and a negligible 0.7 percent of the freight market.

Having made sweeping changes to laws governing land, sea, air and railways over the past few years, the transport sector in Indonesia has just begun its journey from public monopoly to open markets. State monopolies are being dismantled and transport markets are being opened to private sector involvement. The migration from public monopoly to privatisation offers opportunities to establish a new generation of transport industries and infrastructure that will provide much better service to the economy and society. But the transformation will take considerable time to achieve, and all aspects of the legal, planning, and regulatory framework must be orchestrated in a concerted effort to accomplish this vision.

Transport systems and networks in Indonesia are currently dominated by road. This domination is partly due to the fact that road transport is often genuinely less costly than rail, even when the playing field is level. But it is also the result of subsidy and tax policies that give it a cost advantage to users. In more developed regions such as Java and Sumatera, road networks carry more than 90 percent of cargo from the mining, manufacturing and agricultural industries to the ports. Roads also carry the largest share of human passengers. In these two regions, arterial roads are heavily burdened, subjected to high volumes of overloaded trucks and containers, and are constantly deteriorating as a result. Furthermore, road user costs are rising exponentially, due to poor road quality, increasing travel times, more frequent delays and other implicit costs. Congested and damaged roads have created a high-cost economy, reduced competitiveness of export commodities, and hampered economic growth.

A revitalised rail system, therefore, is a key component of any effort to address this state of affairs. Road networks alone cannot be relied on for future transport of cargo and people. Indonesia must build its railway infrastructure, industry and services insofar as rail can reasonably compete with roads. Rail has the potential to be very competitive in terms of cost, and it is attractive from the standpoint of energy efficiency, noise level, CO_2 emissions, and other environmental considerations. It is logical to champion railways as the foundation of an economically sound, multimodal transport system in Indonesia.

Railway Law no. 23/2007 and Government Regulation nos. 56/2009 and 72/2009 have paved the way for massive and rapid development of railways. No longer under public monopoly, Indonesia's railway can now be developed jointly among the GoI, state-owned enterprises, local governments and the private sector. Ideally this will put railways into the economic mainstream, increasing railway's modal share of freight movement, modernising railway industry and services and increasing the extent to which it serves as the backbone of logistics and distribution systems in Indonesia's future economy. The final draft of the National Railway Master Plan indicates a rather massive investment of around USD 90 billion to build and modernise Indonesia's railway through 2030.

Indonesia must build its railway infrastructure, industry and services insofar as rail can reasonably compete with roads.

Such a vision is easy to imagine but hard to bring to fruition. In the wake of the new law, GoI established a national coordination team to formulate a policy framework and actions needed to revitalise Indonesia's railways, chaired

Prakarsa Compendium

Figure 1: Interim Solution

by the Coordinating Minister for Economic Affairs with related ministers as members. The Director General of Railways is the chairman of the executive board, assisted by related Echelon I government officials and a technical team to help analyse developing railway issues. The coordination team's initial mandate expired at the end of December 2009, but may be extended. In its final report to the ministers, the technical team outlined four principal policy actions and steps that government must take to invigorate the railway sector. The policy actions cover sector revitalisation, the institutional setting, corporate restructuring, and capacity building/human resources. In addition, the team recommended that GoI accelerates the development of strategic rail projects through the execution of selected quick-win projects.

One of the specific items that the technical team brought to the attention of Ministry officials is the status of infrastructure and rolling stock companies. The Railway Law provides a strong mandate to government to establish separate entities for the operation of rail infrastructure and rolling stock. The goal is to create a multi-operator setting through which different rail service providers can utilise the same rail infrastructure which is run and managed by a rail infrastructure company. But bureaucratic inertia and indecisiveness must be overcome if the current vertical integration between infrastructure and rolling stock is to be broken.

One option that has been raised is to create a *Badan Layanan Umum*, a special business unit that would operate rail infrastructure under the auspices of the Directorate General of Railways (DGR). However, DGR has done little to promote this idea, much less become its champion. At the same time, the state-owned railway operator, which has held a monopoly for decades, has no apparent incentive to support establishing a rail infrastructure company separate from rolling stock operation. The incumbent rail corporation that operates a vertically integrated business may prefer to keep the business rather than welcome a new player. This is probably understandable since they have long invested in acquiring the skills, experience, management and technology across all aspects of the rail business, including the provision of infrastructure.

The Ministry for State-Owned Enterprises seems remote from the controversy, although they are supposedly supporting the idea of corporatisation and commercialisation of the railway. So there are three institutions involved, each with its own goals and points of view, and so far none of them has adopted the role of facilitator or regulatory mediator that is needed to move beyond the status quo.

As illustrated in Figure 1, the Technical Team has suggested an interim solution designed to move past this stalemate during the window offered by the five-year development plan for 2010 to 2014. Over the next five years, a performance-based contract is to be established between the incumbent operator and the government. Under its terms, the operator is granted the exclusive right to run the infrastructure business, but access must be granted for new rolling stock companies, if there are any, to utilise the railway infrastructure. The contract permits a sort of new, upgraded version of the PSO-IMO-TAC[1] financing scheme. Under the contract, performance of the operator is to be closely monitored and audited as a measure of whether the incumbent will be eligible to provide the rail infrastructure that will be necessary to serve increasing demand from business and industry.

Once this interim solution is implemented, private entities must be granted freedom to enter the rolling stock business and use the rail tracks provided by the contracted rail infrastructure company. In the case of dedicated railways that serve specific cargo such as coal, mining and agricultural products, private companies must also be granted permits and licenses to run the rail business, including both infrastructure and rolling stock. GoI is now under great pressure to make this happen as the law permits, and demand for rail transport for those commodities is extremely high.

This article has focused on issues that relate primarily to rail in its role as a transport mode for cargo. But it seems remiss to close without at least mentioning that urban rail services deserve equal attention from policy makers. Cities in Indonesia, especially on Java, have undergone massive urbanisation. Urban mobility will suffer without the development of mass rapid transit systems. Urban rail revival is among the primary investment programmes listed in the draft of the new Railway Master Plan. A detailed substantive agenda addressing policy, investment and financing, and implementation schemes will be needed to reverse the decay of urban transit systems and revive cities.

In closing, Indonesia's railways will undergo major transformation over the next several decades

People wait to board a train in Jatibarang.
Courtesy of Carol Walker

as the country moves away from too heavy a dependence on road transport. The coming years should be the era of a railway renaissance where there are no suitable alternatives. The foundation for this renaissance must be laid out now. ●

NOTES

1. This acronym refers to Public Service Obligation-Infrastructure Maintenance-Track Access Charges. The PSO-IMO-TAC scheme was stipulated in a 1997 joint decree by the Ministers of Transport, Bappenas, and Finance. It was designed to improve and simplify the financial arrangements between PT Kereta Api Indonesia and the GoI, but has never been properly implemented.

Author's Update

The circumstances described when this article was first published remain largely true over a year later, but a few updates are in order. The coordination team's initial mandate, as mentioned in the sixth paragraph, was indeed extended for a short period of time between April and December 2010. Recently, the technical team assisting DGR provided a recommendation to GoI to greatly enhance the Jakarta-Bogor-Depok-Tangerang-Bekasi railway, so that it has the capacity to carry 3 million passengers a day in 2015. Finally, IndII is nearing completion of a scoping study to identify a new conceptual framework for the PSO-IMO-TAC scheme. ■

About the author:

Prof. Dr. Suyono Dikun is the Chairman of the Technical Team for Railway Revitalisation and a Professor at the University of Indonesia, as well as the former Deputy for Infrastructure at Bappenas and the former Deputy for infrastructure and Regional Development for the Coordinating Ministry of Economic Affairs. He has extensive experience as a Government of Indonesia policy maker, having accepted his first post with Bappenas in 1993. His accomplishments include substantial contributions to the Sixth Five-Year Development Plan (Repelita VI) in the areas of science and technology, human resources, transport, telecommunication, and regional development strategy. During his subsequent assignments with Bappenas, Prof. Dikun oversaw policy direction and budget allocation for regional development, including specific grants for provincial and kabupaten roads. His next portfolio covered the transportation sector, encompassing roads, ports, airports, inland waterways, and land transport facilities. In 1998, Prof. Dikun's assignment was enlarged to cover industry and services, reporting to the Coordinating Minister of Economy, Finance, and Industry. In 2002, Prof. Dikun was appointed as the Deputy Minister for Infrastructure in Bappenas, overseeing transport, power, energy, water, telecommunication, housing, and sanitation. Starting in 2004, Prof. Dikun helped establish the National Committee for the Acceleration of Infrastructure Provision (KKPPI), playing a key role in creating new policy and regulatory frameworks for infrastructure. He was also the Chairman of the Indonesia Transport Society for two terms between 1995 and 2003. A trained civil engineer, he graduated in 1975 from the University of Indonesia, and later received certification as a Highway/Traffic Engineer from Bandung Institute of Technology. Prof. Dikun received his Master and PhD degrees from the University of Wisconsin at Madison in the United States. He takes part in many national and international seminars as a speaker and delegation leader, and is a member of many national and international professional organisations in transport science and project management.

Railway Revitalisation by the Numbers

1998

The year in which the wholly state-owned railway enterprise Perumka was transformed into PT Kereta Api, which, under Government Regulation no. 19/1998, allows private sector investment of up to 49 percent.

15 to 18 tonnes per axle

The typical axle loading for wagons on Java. This is relatively light (22.5 tonnes is more typical of narrow gauge railways) and tends to limit the usefulness of the railway for either modern bi-level passenger services or freight services.

27%; 22%

The amount of total rail revenues that the national railway company PT Kereta Api Indonesia derives from South Sumatera coal traffic and from mainline executive passenger services, respectively.

60 million; 200 million

Tonnes of coal production on Kalimantan in 1999 and 2008. It is currently transported by road and/or river barge as there is no railway system on the island.

434 kilometres

The average distance travelled per trip by executive class passengers on Java, which suggests that rail travel can compete with road and air travel.

The Expert View

The Question: "What do you think is the most difficult challenge that Indonesia faces as it creates and implements a National Railway Master Plan? What should Indonesia do in order to overcome it?"

Ir. Harun al-Rasyid Lubis, M.Sc., Ph.D.
Associate Professor, Transportation Research Group
Bandung Institute of Technology

"The 2030 National Railway Master Plan should be an inseparable part of the Master Plan for the entire national transport sector. Unfortunately, as things now stand, each transport sub-sector plan was separately prepared within the Ministry of Transport. Even more surprisingly, each master plan uses a different transport demand database, not a common platform. This situation will surely result in making it difficult to reach a shared vision for intermodal transport that can hopefully lessen the current excessive negative intermodal externalities in transport infrastructure development.

Recently, in order to further bolster national economic growth, a fundamental policy direction is to develop an economic corridor together with Special Economic Zones, encompassing a previous plan for integrated economic development zones (Kapet). The National Railway Master plan in the context of local, national, and regional connectivity cannot be separated from economic policy goals. Thus, at present the biggest challenge, in my view, is how to integrate the railway master plan with plans for other modes of transport, creating an interconnected transport system that is efficient and includes a feasible long term investment plan. To overcome this challenge, we have no choice but to fit our plans into the economic policy direction already espoused by the government. As soon as possible, the Ministry of Transport needs to make a comprehensive master plan for intermodal transport that is consolidated and which takes into account the advantage of each transport mode. Particularly within the rail sector, the capacity of public institutions needs to be built, in a manner consistent with the new regulatory regime that separates the regulatory role of government from the operational function of corporations."

Prof. Dr. Suyono Dikun
Head of the Technical Committee for Railway Revitalisation

"The most difficult challenge that Indonesia faces in implementing the Railway Master Plan is how to change the perceptions and attitudes of the people who are working in the railway industry, services, and bureaucracy. Indonesia must implement a rather extensive education and training programme to develop human resources and prepare people in the rail sector to run a modern, efficient, and more comprehensive railway industry 20 years from now.

In addition, there is a great need for government to conduct a rather massive consolidation of development funds from both the national budget and private sector investment, through public-private partnerships or Private Financing Initiatives."

Ir. Nugroho Indrio
Secretary, Directorate General of Railways
Ministry of Transport

"The National Railway Master Plan (NRMP) should serve as the foundation and guide for all programmes to develop national railways, now and in the future. The NRMP includes overall strategies for comprehensive development of railway networks and services, enhancement of safety and security, growth of technology and industry, building of human resources, and institutional capacity building, along with strategies for funding and investment. This is a very broad mission, and it requires participation and support from all parties in order for the NRMP to achieve success.

The biggest challenge is to obtain commitment from all stakeholders, from start to finish. It is essential that all points of view are taken into consideration, in order to build ownership of and commitment toward the NRMP and its vision for Indonesian railways up to the year 2030. Stakeholders must take part in all stages of the process – from planning to implementation to evaluation. To ensure that this happens, we invite all parties to be involved: central and local government, railway operators, industry, institutions, researchers, and users – everyone who is affected. Each contribution is essential for developing railways, reporting on progress, and achieving success."

Financing Infrastructure

July, 2010

KEY POINTS *on PSOs and Pioneer Services*

In the transport sector, the Government of Indonesia (GoI) uses Public Service Obligations (PSOs) and Pioneer Services to ensure that socially desirable transport is provided when routes would not be profitable in a free market. These services are usually provided by State-Owned Enterprises (SOEs), with little to no market competition.

Bappenas requested assistance from the Indonesia Infrastructure Initiative (IndII) to review PSO/Pioneer Services policies. IndII recommends that five pillars underpin provision of PSOs and Pioneer Services: access for all, protection of regional sovereignty, transparency, "gap rationalisation" (ensuring the gap between market price and subsidised price makes sense), and competition for services.

A critical new concept is that PSOs and Pioneer Services should be packaged as business opportunities involving competition, investment, profitability, and multi-year contracts that are output- and performance-based.

IndII's team developed a step-by-step process detailing the actions needed at each stage of the development of a PSO/Pioneer Service. Under the proposed process, PSOs/Pioneer Services will be generated at the local or regional government level and passed through the Ministry of Transport to the national planning process. The role of the relevant SOE will be as a service provider, not as the entity setting the amount of subsidy funds provided.

Shifting the Mindset: Public Service Obligations and Pioneer Services in Indonesia's Transport Sector

Framing Public Service Obligations and Pioneer Services as business opportunities with appeal to the private sector can lead to better targeting, improved services and reduced costs.

Peter Benson
Kawik Sugiana

Subsidies are a significant expense for the Government of Indonesia (GoI). Fertiliser, petrol, generic medicine, and electricity are all subsidised. A variety of services are subsidised as well, such as cheap transport that is available to citizens at prices below commercially viable tariffs. Subsidies are a valuable tool to ensure that the poor have access to essential goods and services and to stimulate development. But they can be costly – GoI currently spends about 15 percent of its annual budget on subsidies – and if not properly administered they can result in lost opportunities

to spend funds more effectively elsewhere, and problems such as poorly maintained infrastructure. Moreover, the cost of subsidies in Indonesia has increased dramatically over the past decade without a commensurate rise in the quality and quantity of subsidised services.

In light of such concerns, GoI is looking carefully at Public Service Obligations (PSOs) and Pioneer Services to ensure that these tools for providing subsidies are used in the wisest possible manner. The Indonesia Infrastructure Initiative (IndII) is assisting by conducting a policy review of PSOs and Pioneer Services in the transport sector.

Defining the Terms

In transport, a PSO is an arrangement by which a government provides subsidies to service providers – either private companies or State-Owned Enterprises (SOEs) – to operate a specified service of public transport for a specified period of time. This is done in cases where there is not enough revenue for routes to be profitable in a free market, but it is socially desirable to make the transport available. PSOs can be applied to many modes of transport, including air, sea, road or rail. The infrastructure (railroad tracks, port facilities, etc.) is usually provided by an entity separate from the one operating the subsidised service, and may be owned by the governing body or a third party.

A Pioneer Service is intended to establish transport routes that will promote economic development of a region within Indonesia. As with PSOs, a subsidy is provided to an operator in a situation where there is insufficient revenue for routes to be profitable in a free market, but the service is socially desirable. In Indonesia, Pioneer Services are usually available in the sea and road transport subsectors, but rarely in air or rail transport.

In the current political environment, PSOs and Pioneer Services are receiving close attention. Policy makers want a clear picture of the amounts being spent, the choice of targets, and whether funds are best spent on PSOs/Pioneer Services or could be better directed to other opportunities such as infrastructure investment.

The "policy pillars" for PSOs and Pioneer Services are: access for all, sovereign stability (that is, the protection of regional sovereignty and economic development), transparency, "gap rationalisation" and competition for the provision of services.

Countries have historically found that Public Service Obligations are an imperfect mechanism, sometimes leading to inadequate maintenance of related infrastructure.
Courtesy of Peter Benson

IndII has been asked by Bappenas to undertake a policy review of PSOs and Pioneer Services in the transport sector. The goals are to assist GoI to target funds to where they can best be used, and to create better systems for management and implementation.

The PSO and Pioneer Service system in Indonesia is characterised by direct assignment of subsidies to SOEs. There is some market competition for the provision of Pioneer Services, but not for PSOs because the service is not tendered to the market; SOEs are routinely assigned the role of delivering services related to PSOs. In any case, the environment for either PSOs or Pioneer Services is not conducive to private sector participation; contracts are generally limited to 12 months, so risks are too high to attract private sector interest.

Indonesia is not alone in facing problems related to transparency and performance measures in the implementation of PSOs and Pioneer Services; many countries experience difficulty in this regard. The United States of America, for example, does not have totally transparent management and neither does Australia. A report by the Organisation for Economic Co-operation and Development, *Policy Roundtables: Non-Commercial Service Obligations 2003,* clearly indicates that politicised and non-transparent decision-making in relation to PSOs is a widespread issue, affecting the US, Canada and some member states in the European Union. Measurement of impacts is also weak. Australia does have specific management policies in place, but the process is still politically driven. Countries grapple with concerns over how they can allocate PSOs without supporting monopolies on service provision by SOEs.

The IndII team is taking a practical approach to analysing PSO/Pioneer Services. The process begins by asking basic questions such as, "Why does GoI want to have a PSO/Pioneer Service policy in place?" and, "What is the definition of a PSO/Pioneer Service?" The answers to these questions establish the framework within which a clear policy can be developed.

The IndII team has almost completed its task, and its review of PSO/Pioneer Services encompasses the following features:

- The definitions of PSOs and Pioneer Services are explicitly stated in order to establish the policy framework.

- The policy is aimed at PSO/Pioneer Services that are funded fully or partially by the national government.

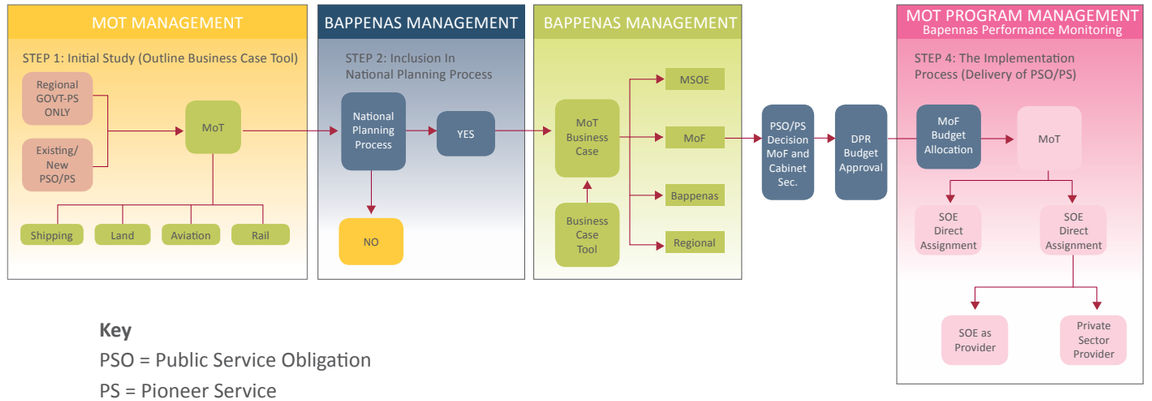
- The "policy pillars" for PSOs and Pioneer Services are: access for all, sovereign stability (that is, the protection of regional sovereignty and economic development), transparency, "gap rationalisation"[1] and competition for the provision of services.

- PSOs and Pioneer Services are treated as business concepts. Therefore, certain elements are required: service providers should compete with each other, they should make investments in the business, they should be able to earn a profit, and they should be able to obtain multi-year contracts that allow them to plan and operate over a reasonable time horizon.

- In keeping with the business orientation, the focus is on establishing and evaluating PSOs and Pioneer Services based on performance: choosing the provider that offers the maximum quality and quantity of desired services in exchange for the subsidy offered. There must be a link between expenditures and output, rather than limiting the focus to inputs.

- A clear process for managing PSOs and Pioneer Services is established.

Figure 1: PSO/PS System Process



Key
PSO = Public Service Obligation
PS = Pioneer Service
MoT = Ministry of Transport
MSOE = State Ministry for State-Owned Enterprises
MoF = Ministry of Finance
DPR = Dewan Perwakilan Rakyat (House of Representatives)
SOE = State-Owned Enterprise

Embracing New Concepts

There are three new concepts in the policy approach that is being recommended. The first is the explicit articulation within the Ministry of Transport (MoT) of the five policy pillars (access for all, sovereign stability, transparency, gap rationalisation, and competition). These pillars are intended to lead to specific actions, such as the establishment of a competitive market for the tender and delivery of PSOs and Pioneer Services.

The second new concept is the recognition that providing a PSO or a Pioneer Service is a business, and therefore government should package it as such, making it into a profitable and attractive opportunity and demanding performance in exchange for funds provided.

the Business Case can assist the Government to take an objective approach to the provision of subsidised services. Instead of awarding contracts on a historical basis, the Business Case helps GoI to pinpoint where need exists and what outputs should be expected for what level of expenditure.

Two strategies underpin the development of PSOs and Pioneer Services as a business opportunity: the use of a "Business Case" and the implementation of multi-year contracts to attract investment and service improvement.

Shifting to this business mindset is crucial to the practical success of the revised PSO/Pioneer Services policy. Two strategies underpin the development of PSOs and Pioneer Services as a business opportunity: the use of a "Business Case" and the implementation of multi-year contracts to attract investment and service improvement. Both the Business Case and multi-year contracting are focused on outputs, in contrast to the input-based contracts that are typically used at present.

The Business Case is a tool for testing the economic and financial viability of a PSO/Pioneer Service. It provides the Government with information about demand, financial and economic outcomes and the potential profitability of delivering a service. It allows the Government to be a knowledgeable purchaser of services and to present the private sector actors with information they can use to judge the financial viability of a business. Use of

The third new concept is the development of a four-step process that spells out in detail the actions needed at each stage of the development of a PSO/Pioneer Service and identifies the parties responsible for all tasks (see Figure 1). Two significant changes are central to the new process. First, Pioneer Services will be generated at the local or regional government level and then passed through MoT to the national planning process. Second, the role of the relevant SOE is as a service provider, not as the entity setting the amount of subsidy funds provided. Bappenas will be the overseer of the policy, while MoT will deliver the PSO/Pioneer Service programme and measure outputs. The benefits of this approach are that GoI can more effectively target PSO and Pioneer Services (because customers are better defined); there are more opportunities to lower costs and/or increase service standards; and performance is measured so that appropriate programme or service delivery changes can be made.

Implementing these strategies will be a challenge. Institutional change is needed, but the single most important aspect of a successful policy is to conceptualise PSOs and Pioneer Services as a business, and to create an environment within which business operations will result in better targeting and delivery of services. A five-year implementation approach is being planned, with the hope that the outcomes that can be realised will benefit both citizens in need of affordable transport and policy makers working toward Indonesia's economic development. •

NOTES

1. In other words, policy makers should be sure that services do not cost consumers less than they are actually willing to pay, since this would be an inefficient use of government funds.

About the authors:

Peter Benson has worked in the field of international consulting for 16 years, first at the Victorian Road Authority (VicRoads) and since 2000 as a consultant to the Asian Development Bank, the World Bank, AusAID, the Swedish International Development Agency and USAID. He has worked in East Timor, Bhutan, India, Malaysia, Indonesia, the Philippines, Tonga and Afghanistan. Peter has broad experience in infrastructure management, but specialises in roads and road transport. He worked in the civil service in Victoria, Australia for 26 years and rose to management positions in the fields of legislation, project management, and policy and institutional issues. Peter has been involved in the development of public policy for more than 30 years as well as programme and project management. He has a Law degree and a Diploma from the Institute of Company Directors.

Kawik Sugiana is a regional planner and infrastructure consultant who has been active in a wide range of research and studies in regional development and infrastructure provision. He completed his Doctoral degree in Regional Planning in the US at the University of Wisconsin, Madison. He has held various positions during the last 15 years, including: National Programme Manager of the PARUL (Poverty Alleviation through Rural and Urban Linkages) programme under UNDP-Bappenas (1996 to 2000); Deputy Assistant V responsible for Infrastructure and Regional Development in the Coordinating Ministry for Economic Affairs (2000 to 2001); and Head of the Masters Programme in Urban and Regional Planning at the University of Gadjah Mada (2001 to 2006). His focus on infrastructure began in 2006 when he was appointed as an Executive Secretary of the KKPPI (National Committee for the Acceleration of Infrastructure Provision). He is currently serving as an infrastructure specialist for the PSO Policy Reform Project (IndII – Bappenas).

KEY POINTS *on Badan Layanan Umum Daerah*

Financing is an important issue not only in the construction of infrastructure but also the delivery of infrastructure services. The Next Step Agencies, launched in 1988 in the United Kingdom, offer a service delivery model based on the concept that service delivery units should operate along commercial lines to the greatest possible extent. By creating units responsible for providing a narrow range of services for a fee, performance measurement and accountability are maximised, and a link is drawn for constituents between money paid to government and services received in return.

In Indonesia, agencies that are established to provide fee-based services but are expected to require government subsidies indefinitely are referred to as BLU (national government-owned service companies) or BLUD (local government-owned service companies). A regulatory framework for the formation of BLUD units has been developed through Law no. 1/2004 and subsequent government regulations in 2005 and 2006.

There are over 500 local governments in Indonesia, and use of the BLUD model has potential to dramatically improve their service delivery. So far, uptake has been restrained due to lack of local knowledge of the model and how to implement it. The Ministry of Home Affairs is now promoting the concept, which should lead to accelerated use of BLUDs. If practical tools and guidance are developed and provided to local governments, the BLUD model may impact a broad range of basic services in the coming years.

A Promising Concept for Local Service Delivery

New organisational units at the local level for the provision of infrastructure services, designed with a higher degree of autonomy and accountability, have the potential to improve service provision and ensure that citizens know exactly where the fees they pay are ending up.

Darryl Howard

"Infrastructure financing" calls to mind capital expenditures for bridges, roads, airports and the like. But it is just as much an issue in the delivery of infrastructure services. Over the years, governments across the world have created a wide range of organisational arrangements to provide services to their constituents – both at national and local levels. Although we could go back hundreds of years to discover some of the earlier forms of organisations tried by governments to provide services efficiently and accountably, a good starting point is the Next Step Agencies launched by the Margaret Thatcher administration in the United Kingdom in 1988. The vision driving this initiative was based on the beliefs that:

Garbage collectors along Jalan Kartini in Jakarta. Solid waste disposal services are good candidates for management by a BLUD. *Courtesy of tbSmith on flickr*

- Governments should be involved in providing services only when there are good reasons for not using private arrangements.
- When a government role is justified, wherever possible it should operate along commercial lines.
- Managers should be free to decide whom to hire and to set their compensation.
- Managers should have broad discretion to operate within agreed budgets.

A Successful Approach

Under the Next Step Agencies initiative, the removal of line activities from the day-to-day activities of governmental departments freed government officials to focus on policy development and the appraisal of services provided by their agencies. Overall, this initiative was deemed very successful as it dramatically raised the performance and cost management orientation within the many agencies carrying out government functions. This initiative has since been emulated by many other governments in both developed and developing countries. (A very comprehensive and interesting survey of initiatives taken in this area is provided in the 2002 OECD document *Distributed Public Governance Agencies, Authorities and Other Government Bodies*.)

Under this management philosophy, organisational units are created to be accountable for providing a relatively narrow range of government services, for example issuing drivers' licenses, passports, or other permits. This relatively narrow range of responsibility is intended to allow the unit's efficiency to be measured with a reasonable degree of accuracy and to make it possible to hold the managers of the unit accountable for the efficiency and effectiveness of its operations. These units charge fees for their services, but in general the fees collected are not sufficient to fully cover their costs so they require continuing government subsidies. However, even if the fees do not fully cover the cost of the services, making payments does have the advantage of drawing a link for constituents between the money they pay to government and the services they receive in return.

Sometimes Profitable, Sometimes Not

Before going on with the discussion of such governmental service units, it is necessary to make a basic distinction between two basic types of government commercial agencies: first,

The financial management requirements established by these regulations are intended to provide adequate financial controls while also providing the freedom and flexibility for both BLU and BLUD to provide services effectively and efficiently.

government-owned commercial enterprises (normally companies that, even if they are not profitable at the present time, can aspire to profitability in the future), and second, governmental units that are created to provide fee-generating public services, but the fees received are not enough to cover the cost of the services provided, and the units are expected to require government subsidies indefinitely.

Indonesian examples of companies in the first category are Pertamina (the government petroleum company) and Garuda (the government-owned airline). Companies like these could be owned by private shareholders, but are established as government-owned commercial enterprises because this is considered to be in the national interest. In Indonesia, such government-owned companies are referred to as BUMN (national government-owned enterprises) or BUMD (local government-owned enterprises).

The Transjakarta Busway and local government-owned hospitals are good examples of companies in the second category – service companies that are expected to require government subsidies indefinitely. Organisations that are established to provide subsidised government services are referred to as BLU (national government-owned service companies) or BLUD (local government-owned service companies). This article focuses on BLU and more particularly on BLUD – government service companies owned by local governments.

Governments around the world have grappled with the issue of how to deliver services not only efficiently, but in a manner free of corruption, especially when the entities providing the services charge fees for them. In an effort to reduce corruption, in 1997 the Government of Indonesia passed Law no. 20/1997, requiring any government entity receiving non-tax receipts (*penerimaan negara bukan pajak*, or PNBP) to deposit these funds into a designated government bank account as soon as possible. This made it impossible for service-providing government entities to use the funds that they received to cover even a portion of their cost of operations. However, seven years later Law no. 1/2004 was passed, which offered a comprehensive legal framework for accounting for the allocation and use of state funds, opening the door to the formation of BLU units. Two subsequent regulations – Government Regulation no. 23/2005 concerning the financial management of BLU units, and Government Regulation no. 58/2005 concerning regional financial management – established a framework for the formation of BLUD units. Subsequently, the Minister of Home Affairs issued MoHA Regulation no. 61/2006, laying out financial management technical guidance for BLUD units.

Among the other important impacts of these various regulations, they free BLU and BLUD units from the very restrictive requirements of Law no. 20/1997 concerning the handling of non-tax receipts. The financial management requirements established by these regulations are intended to provide adequate financial controls while also providing the freedom and flexibility for both BLU and BLUD to provide services effectively and efficiently.

A Model With Potential

As there are now more than 500 local governments (provinces, regencies and cities) in Indonesia, the use of the BLUD model has the potential to dramatically improve the delivery of basic goods and services to their constituents. In late 2009, the Indonesia Infrastructure Initiative (IndII) undertook a scoping study that assessed the level of uptake of the BLUD concept to date and determined potential IndII assistance that might facilitate the uptake of the BLUD concept.

This scoping activity determined that, despite the opportunities for the BLUD model in infrastructure service delivery, the uptake had thus far been quite restrained. There are a number of factors behind this, most notably the lack of information and understanding at the local level regarding the BLUD model of service delivery and how best to implement it. With MoHA providing information and leadership to promote the concept, adoption of the BLUD model is expected to occur at an accelerated pace.

What Happens Next

What needs to be done next to move the BLUD concept forward? MoHA is taking stock of the regulations and guidelines, and is evaluating tools such as pilots and surveys that it can potentially use to refine its insights into the advantages of BLUDs and the difficulties associated with organising them. Based on these activities, the next step will be to prepare materials that local governments can use for practical guidance as they form BLUDs, and to launch a promotional programme directed at local governments to inform them about the advantages of establishing BLUDs.

The potential to create BLUDs across Indonesia is exciting – perhaps 5000 BLUDs (an average of 10 units per local government) or more will be formed in the next five years. The BLUD model is applicable to a very broad range of basic services provided at the local government level that touch all of the citizens of the country on a daily basis. •

This relatively narrow range of responsibility is intended to allow the unit's efficiency to be measured with a reasonable degree of accuracy.

About the author:

Darryl Howard, a Canadian citizen, moved to the United States for graduate studies. He obtained an MBA, majoring in finance at the University of Washington, and subsequently joined the Exxon Corporation in Houston. After assignments in New York, Bangkok, Tokyo, Southampton and Sydney, Darryl was assigned as Chief Financial Officer for Exxon's Indonesian operations in Jakarta. After approximately 10 years in this position, Darryl left Exxon to become a Jakarta-based independent consultant.

Output-Based Grants in Perspective

As the Government of Indonesia turns its attention to new types of mechanisms to fund regional government investment, it is illuminating to consider the backdrop against which these techniques are being implemented.

Maurice Gervais

KEY POINTS *on Output-Based Performance Grants*

Ninety-three percent of funding from the Government of Indonesia (GoI) to localities is in the form of unconditional grants, which makes it difficult for GoI to use this funding as a tool to press forward with national priorities. The current means by which GoI provides capital grants to help regions fund their investment needs is the DAK (*Dana Alokasi Khusus*, or special allocation funds), but, with the exception of road sector funding, the modest amount of DAK funds allocated to infrastructure barely covers routine and periodic maintenance and does not make it possible for localities to undertake large projects.

Against this backdrop, GoI has intensified its efforts to strengthen infrastructure investment by means such as the revitalisation of Hibah Daerah capital grants and on-lending of funds by GoI to the regions. These two approaches are quite different to DAK grants: they are intended to respond to regional proposals for investment funding; they rely on performance-based output contracts; and they channel funds to the regions by paying when clearly defined performance goals are met, rather than making payments in advance. Such output-based performance grants are a promising strategy for GoI to achieve national infrastructure development priorities, and they offer an official point of entry for donors concerned with meeting specific goals and requirements. The regulatory framework now being developed will provide a stepping-stone to the next phase of output-based grants.

In a relatively new trend, Indonesia is turning to output-based performance grants as a means of providing capital investment support to regional governments. To understand why these mechanisms offer a valuable means to effectively support infrastructure development in coming years, it is useful to consider the backdrop against which they are being introduced.

Indonesia's intergovernmental fiscal system is understandably a work in progress, given that the push toward decentralisation has only occurred over the last decade. There are several key challenges, the first of which is to directly address the expenditure needs of an increasingly large number of regional governments. There are 512 autonomous cities and districts and 33 provinces, 225 of which have been created since 2001. Indonesia is an exceptionally diverse country, with major variations in economic resource bases, population densities, and infrastructure assets. There is a wide gap between the level of revenue most local governments can generate and their budgetary needs. For the Government of Indonesia (GoI), providing all regions with the fiscal resources they need to fund regional and local services is a major undertaking.

Most mature federations decentralise to states/provinces the task of providing capital grants to communities and regulating their access to capital markets. This is not the case in Indonesia, where the governance relationship between the central government and districts/cities is direct. Perhaps by necessity, the allocation formulas that GoI uses to determine the level of revenue sharing for individual localities provide an approximation of expenditure needs rather than a fine-tuned approach based on specific local needs.

Grants to localities through Indonesia's *Dana Alokasi Khusus* provide only modest funding for key infrastructure sectors such as irrigation.
Courtesy of Kendra on Picasa

The vast majority (93 percent) of funding provided by GoI to localities comes in the form of unconditional grants (the *Dana Alokasi Umum*, or general allocation grant; shared revenues [*Dana Bagi Hasil*]; and *Dana Otsus* – special autonomy transfers). By their nature, they do not provide GoI control over how regions use these funds. GoI has leverage only through the DAK (*Dana Alokasi Khusus*, or special allocation grant) and the requirement that regions provide 10 percent matching funds. Thus, generally speaking GoI funding to local governments does not serve as an effective mechanism to engage the regions in programmes driven by national priorities.

The DAK is the current means by which GoI provides capital grants to regions to help them fund their investment needs. But, while DAK education grants are quite large and some grants for roads are significant, the remainder are not. This includes the grants that fund key infrastructure sectors (such as irrigation, water and sanitation). DAK infrastructure grants provide modest funding, at a typical amount of Rp 2.3 billion for each region, which barely covers routine and periodic maintenance. The lack of large projects undertaken by localities is a reflection of this.

DAK grants were introduced in 2003 and the amount of funding provided through this mechanism increased tenfold up until 2008. But recent fiscal constraints caused by the worldwide economic downturn have arrested the rapid growth of DAK grant funding. Since 2008, total funding has declined in real terms, and infrastructure's share, which had gradually declined over the years, has fallen to about 25 percent of the total.

Generally speaking, GoI funding to local governments does not serve as an effective mechanism to engage the regions in programmes driven by national priorities.

This is the context within which GoI has been intensifying its efforts to strengthen infrastructure investment. Since 2005, GoI has addressed a broad range of issues, including the revitalisation of Hibah Daerah capital grants and on-lending of funds by GoI to the regions. These two approaches are quite different to DAK grants: they are intended to respond to regional proposals for investment funding; they rely on performance-based output contracts; and they channel funds to the regions by transferring funds after clearly defined performance standards are met, rather than making payments in advance.

Hibah grants and on-lending arrangements are promising strategies for GoI, and they offer excellent opportunities for donors. They can serve as an official point of entry for donors who are willing to provide investment support to the regions in a manner that is both consistent with the Jakarta Commitment[1] and that establishes required outputs. The DAK system does not offer the same opportunities: donor resources made available through DAK must be fully fungible, and GoI cannot supervise the implementation of programmes supported by DAK funds.

Concurrently with the increased focus on Hibah grants and on-lending arrangements, GoI is in the process of revising three Government Regulations (*Peraturan Pemerintah*) – GR no. 2/2005, GR no. 54/2005 and GR no. 57/2005 – as part of a total package that accommodates the entry of donor funding into the budget process and improves the legal framework for on-lending and on-granting of funds by GoI. The Indonesia Infrastructure Initiative is now supporting this effort by helping to design an effective Hibah capital grant system. Most of the key components have been defined in the draft regulation and provide a stepping stone to the next phase of output-based grants. •

NOTES

1. The Jakarta Commitment is an agreement signed by GoI and 22 countries and multilateral donor agencies. It states that signatories will follow the Paris Declaration on Aid Effectiveness, which is intended to improve the effectiveness of foreign grants and loans. The central tenet of the Commitment is the affirmation of Indonesian ownership of all aid initiatives.

About the author:
Maurice Gervais is a senior fiscal decentralisation specialist who has acquired broad experience as a development practitioner since 1972. His career includes 22 years as a staff member of the World Bank. Since leaving the Bank, he has done 12 years of consulting work in Indonesia, mainly focused on decentralised governance and regional public finance management reforms.

Prakarsa Compendium

A New Generation of Public Private Partnerships

Since the financial crisis, there has been little development of Public Private Partnership projects to fund Indonesia's infrastructure needs. As constraints that limited PPP projects are being overcome, the Government of Indonesia is poised to change this situation.

Mike Crosetti

KEY POINTS *on Public Private Partnerships*

Fifteen years ago, Indonesia was a leader in PPP infrastructure among developing countries, with billions of dollars of projects underway. The Asian financial crisis abruptly ended that. Over the past decade, economic growth has returned and once again the Government seeks to leverage its resources for infrastructure delivery through the use of PPP. However, only a handful of relatively small PPP infrastructure projects have been commissioned during this period.

This paper assesses the reasons for the lack of new projects to date and considers the implications for the targeted scale-up of PPP investment. The article concludes that the Government has made progress in some areas, and should now continue the creation of conducive sector policies and focus on internal capacity building across line ministries and regional governments if the new generation of PPP is to move from potential to reality. This capacity building includes formulation of procedures for project preparation across agencies, internal promotion of PPP, and training of officials to enhance understanding of how PPP works.

Public Private Partnership (PPP) is not new to Indonesia. In the late 1980s and early 1990s, the Government recognised the need to leverage infrastructure investment by engaging the private sector through PPP. By the end of 1997, Indonesia had attracted more than USD 20 billion of infrastructure investment on a PPP basis, dominated by the electricity, telecoms, and transport sectors. This activity was brought to a halt, however, by the collapse of banks and extreme currency depreciation resulting from the Asian financial crisis, which began in the latter half of 1997.

The Asian financial crisis came and went, but Indonesia's infrastructure investment needs have continued to grow. The economic growth of the past several years has exacerbated the

Worldwide, power generation is an infrastructure sector that is often a candidate for Public Private Partnerships.
Courtesy of Waymond C on flickr

need for infrastructure investment, and again the Government of Indonesia (GoI) is not in a position to fund this entirely on its own. PPP clearly has a role, and GoI has a target of attracting Rp 978 trillion of private investment in infrastructure over the period 2010 to 2014. This target is about 20 times greater than the actual private investment in PPP infrastructure over the past 10 years.[1] With such an ambitious goal in place, it is useful to ask why the commission of new PPP projects has been limited over the past decade despite the need for investment, and how the answers to that question can inform strategies for the future.

Outcomes of some pre-crisis projects have provided valuable lessons on the pitfalls of PPP. For example, GoI and companies such as Pertamina had to pay large settlements to foreign investors and guarantors for the cancellation of PPP projects. These experiences have made both GoI and private investors aware of the need for a structured approach to future PPP ventures; at the same time, post-Suharto political reforms have strengthened transparency and decentralised power. For these reasons, future PPPs will be significantly different from the old model.

A structured approach to PPP relies on four building blocks for success: a legal foundation; institutional capacity and coordination; sound project preparation; and the availability of financing. These building blocks serve as necessary conditions for PPP development. Understanding how these elements have played out in Indonesia offers guidance on how PPP can live up to its promise in the future.

First, a Legal Foundation

Before anything can happen in PPP, there must be a legal foundation that establishes organisational roles and defines how PPP is to be implemented. GoI took the first step by establishing the Policy Committee for Accelerating the Provision of Infrastructure (KKPPI) under Presidential Regulation (PR) no. 81/2001, which was updated by PR no. 42/2005. Also in 2005, GoI redefined the substance of PPP implementation through PR no. 67/2005, which replaced Presidential Decree no. 7/1998. This was followed by Ministry of Finance Regulation (MFR) no. 38/2006 on risk management in infrastructure projects. Accompanying these regulations, there has been fundamental legislative reform of virtually every major infrastructure sector. This reform has removed state monopolies, devolved regulatory autonomy to regional governments, and introduced competitive tendering. However, much work remains to be done on preparation of implementing regulations, and the strengthening of institutions to perform these functions.

PR no. 67/2005 has been updated by PR no. 13/2010, and the Government has also recently established infrastructure finance and guarantee companies. A useful next step would be the update of MFR no. 38/2006 to expand the use of government guarantees, along with implementing regulations in some sectors, and further changes in the legal basis for the Government to acquire land.

Therefore, the first factor contributing to the limited use of PPP during the post-crisis period – the absence of a comprehensive legal framework, both in terms of sector-specific regulation as well as PPP more generally – has been largely redressed. Given the profound political changes and scope of industry reform that has taken place, the amount of time this has taken is understandable. The momentum that has been achieved in the past

few years is expected to continue, with attention to some key legal elements expected soon. In addition to further elaboration of sector-specific regulations, an update to MFR no. 38/2006 is expected soon that will streamline the guarantee process and expand the types of guarantees available, including guarantees covering credit risk of state-owned off-takers.

Institutional Capacity and Coordination

Operationalising the legal foundation requires institutional capacity, and for a cross-sectoral PPP framework, institutional coordination. Such capacity entails:

- Recognition by Government officials of the role and benefits of PPP
- Understanding by Government officials of PPP modalities
- Clearly defined preparation processes, supporting tools and documentation within Government
- Integration with broader Government strategy and planning efforts

Achieving institutional capacity and coordination is one of the biggest challenges for PPP development in Indonesia today. The establishment last year of a Public Private Partnership Central Unit within Bappenas is an encouraging move in that direction. But there is still a need for Government personnel – especially in the line ministries and regional governments that are responsible for the identification, development and supervision of PPP projects – to gain a higher level of insight into how PPP works and the benefits it can bring. A better understanding of these benefits will serve as an incentive for officials to pursue the unfamiliar and untested path of PPP to meet infrastructure targets.

Moreover, even when Government officials recognise the benefits of PPP and understand conceptually how it can be implemented, clear procedures and tools for preparing projects within Government are still necessary. To successfully integrate PPP with broader planning efforts and coordinate it across the various agencies involved, these needs must be addressed. These mechanisms must address not only the identification, design and coordination of the physical project and selection of the PPP modality, but also the budgeting of any direct Government support and processing of Government guarantees that may be necessary for projects to proceed.

The current environment offers opportunities for GoI to draft standard operating procedures for PPP development and implementation, and to comprehensively engage stakeholders. This kind of engagement will ensure the feasibility and effectiveness of the resulting procedures, as well as the acceptance and buy-in of the agencies expected to implement the procedures.

Project Preparation

The third building block for successful PPP is sound project preparation, or more specifically, the ongoing identification and preparation of properly structured projects. This “deal flow” can be distinguished from institutional capacity, since projects can be prepared and transactions can be conducted with the help of outside advisers. Until now, engagement of such advisers has been limited. Moreover, their effectiveness depends upon completion of the legal frameworks and institutional strengthening referenced above.

In some cases, Government agencies that sponsor PPP projects have not been fully aware of the value that outside advisers can bring to structuring these projects, or they have been concerned that a more structured approach involving engagement of advisers and full compliance with PPP regulations would take too much time. In this respect, institutional capacity is a prerequisite for Government agencies to recognise where and when outside advisers are appropriate.

Resources are now available that GoI can utilise to enhance its PPP project preparation efforts. The Technical Advisory Services (TAS), financed under the Asian Development Bank’s Infrastructure Reform Sector Development Project loan, and similar assistance such as the International Finance Corporation’s (IFC) advisory services for the preparation of the Central Java coal-fired power plant, are means to ensure that there is a flow of properly structured projects to market. Given that TAS only began full operations in 2009, and projects like the Central Java power plant have required extended preparation as the underlying legal frameworks and institutional coordination have been firmed up, the results are not yet evident in terms of the award and financial close of projects.

Coupling these resources with an emphasis on greater institutional capacity within GoI will ensure that this leads to a sustainable programme that can meet the Government’s ambitious private investment targets, instead of just the ad hoc success of individual projects.

> Before anything can happen in PPP, there must be a legal foundation that establishes organisational roles and defines how PPP is to be implemented.

Availability of Financing

Successful PPP, of course, also depends on the availability of financing. Since few new generation projects have reached the financing stage, there is no conclusive evidence whether financing will be readily available for a large number of well-structured projects. Certainly, the recent establishment of the Indonesia Infrastructure Fund can help ensure the availability of financing, while the Indonesia Infrastructure Guarantee Fund can help mitigate risks perceived by lenders, particularly those offshore that may be more sensitive to country risks.

Domestic banks have until now devoted only a small portion of their lending portfolios to

infrastructure. It would, of course, be helpful to encourage or facilitate greater domestic lending for infrastructure, but at present there is no evidence that financing is unavailable for properly structured projects.

In summary, while the long gestation period for enabling regulations and the delayed engagement of project preparation advisers contributed to the slow-down of PPP in post-crisis Indonesia, the necessary legal forms and advisory programmes are now largely in place. Whether PPP reaches its potential now depends on the Government's internal institutional ability to implement and coordinate PPP activities. Recent pronouncements by the President and ministers indicate the will to make this happen, although pronouncements alone do not guarantee success. Formulation and implementation of specific procedures and standard operating procedures for PPP across Government, and capacity building and promotion of PPP within line ministries and regional governments, are the keys to future progress of a sustainable and greatly expanded PPP programme. The Government of Indonesia now has the opportunity to ensure that PPP achieves its potential. •

NOTES

1. PPP projects that started operation during the past decade include more than a dozen relatively small independent power projects, about a half dozen new toll road segments, a handful of water distribution projects, and a few telecoms projects to meet the universal service obligation. The total value of these PPP projects is estimated to be less than USD 2 billion, though it is useful to keep in mind that this figure does not represent the sum total of all private sector investment in Indonesian infrastructure.

About the author:
Mike Crosetti is managing director of Castlerock Consulting, an energy, infrastructure and IT advisory firm with offices in Jakarta and Singapore. He brings more than 25 years experience advising governments and companies on strategy, policy, regulation and restructuring in the energy and infrastructure sectors. During the past 15 years, he has worked from Jakarta on assignments throughout Asia. In 2008, he led the team that supported Bappenas for the establishment of the Public Private Partnership Central Unit. More recently, under funding from IndII, he prepared the Government of Indonesia's PPP Investor's Guide released at the Infrastructure Asia conference. He is now leading a team under World Bank financing to assist the Ministry of Energy and Mineral Resources on a new pricing, policy and regulatory framework for geothermal power in Indonesia. Previously, Mike was a partner in PA Consulting Group, an energy planner at the World Bank, an analyst at the Jet Propulsion Laboratory, and a Fulbright Scholar. He received his B.A. in Philosophy and M.Sc. in Engineering-Economic Systems from Stanford University.

Infrastructure Finance by the Numbers

USD 47.3 billion
The value of the 100 Public Private Partnership infrastructure projects now on offer by Indonesia for the period 2010–2014, according to Bappenas.

Rp 1430 trillion
Indonesia's infrastructure financing requirement between 2010 and 2014. The Government of Indonesia's funding capacity is Rp 980 trillion, or about 68 percent of that amount.

< 10%
The amount of regional expenditures that are covered by regional taxes, leaving localities unable to undertake significant infrastructure initiatives on their own.

980; 5179
The number of individual DAKs (Special Allocation Grants) made by the national government to regions in 2003 and 2010 respectively. It is hard to concentrate resources on a select set of carefully chosen projects when the grant distribution is increasingly fragmented.

USD 50 billion
Total financing required, according to the World Bank, to improve Indonesian roads, ports, airports and power-generating capacity over the next five years.

The Expert View

The Question: "What can be done in Indonesia so that infrastructure financing mechanisms can be exploited more fully?"

Yuniar Affandy, SH., MM
General Director
PDAM Lombok Timur, West Nusa Tenggara

"Local governments will benefit from a clear central government policy on the position of local water companies (PDAMs). This national policy will then become an umbrella for local policy. It is very important for PDAMs to achieve a balance between their social mission and their commercial one. PDAMs will always have difficulty expanding and meeting their operating costs if they are only positioned as a social entity. The public must understand that PDAMs must be in a healthy financial condition if they are to meet minimum standards of service provision.

PDAMs in remote locations find it difficult to access loans from commercial banks to expand their infrastructure, because most of them do not have healthy financial ratings. Aside from enhancing opportunities for PDAMs to access commercial credit, financing support from the national budget (APBN) and grants from donor organisations are essential in the future. With assistance from IndII, our PDAM has developed a sound business, and we are now moving towards obtaining a commercial loan from a state-owned bank.

If funding, from donors or through bank loans, proceeds smoothly, the hopes of both the government and the people will be met. People will obtain access to clean water and improve health standards. At the same time the PDAM can quickly reach a healthy financial status so that it can operate more independently. This will be a success for the government in providing water to a broader range of the community."

Drs. Reydonnyzar Moenek, M.Devt.M*
Head of Information Center and Spokesperson
Ministry of Home Affairs

"There are many opportunities for providing basic services to the public through BLUD [*Badan Layanan Umum Daerah*, or Regional Public Service Agencies] that can be initiated by local governments. Some good examples are the management of solid waste final disposal sites, bus services, hospitals or even liquid waste treatment facilities. In fulfilling the potential of BLUD, we face the classic challenges, including planning, implementation, and monitoring and evaluation. But attention also needs to focus on establishing the legal basis (which does not exist yet) for an activity that spreads across more than one city or kabupaten. A solid waste final disposal site located on the border of two towns is a good example of this."

* Director for Regional Revenue and Investment Administration, Ministry of Home Affairs, 2008–2010

Yadi J. Ruchandi, CFA
Chief Operating Officer Indonesia Infrastructure Guarantee Fund
PT Penjaminan Infrastruktur Indonesia

"Public funding alone is not enough to fill the financing gap in infrastructure. There is a need for market-orientated infrastructure financing policies based on international best practice, tailored to the Indonesian context. The Government of Indonesia has made some progress in the area of infrastructure Public Private Partnerships (PPPs), including establishing a supportive regulatory and institutional framework, and pursuing several PPP transactions. More attention must be focused on strengthening the project preparation process, placing a greater reliance on external advisers, and improving the quality of feasibility studies, as well as developing the Indonesia Infrastructure Financing Facility to mobilise long term local currency funds to finance infrastructure PPPs. Since infrastructure PPPs in Indonesia are still considered high risk investments, the Indonesia Infrastructure Guarantee Fund is designed to improve the quality of infrastructure PPPs. Guarantees provided by IIGF will focus specifically on pre-construction, construction and/or operating risks associated with government actions (such as allocation of land and issuance of permits and licenses), and facilitate the engagement of private investors in project preparation."

Expanding Access to Water

October, 2010

KEY POINTS *on Strengthening Local Water Companies*

In 2002, only 9 percent of Indonesia's local water companies (PDAMs) were rated "healthy" by the Ministry of Public Works. By 2009 this had increased to 42 percent, but many challenges remain: services reach only about 30 percent of the urban population; expenditure levels are inadequate to maintain and expand infrastructure and services; and central government grants, formerly the traditional source of funding, have declined with decentralisation. Indonesia can meet its commitments under the UNDP's MDGs (Millennium Development Goals) if its PDAMs adopt principles of good corporate governance (GCG) and improve their financial and operating practices. This will enable them to access funding through improved efficiency; Public Private Partnerships; tariff rationalisation; and commercial loans facilitated by Presidential Regulation no. 29/2009, which seeks to enable PDAMs to access investment loans from commercial banks by providing central government loan guarantees.

The Indonesia Infrastructure Initiative is managing an AusAID-funded project to assist PDAMs to improve their bankability, and has initiated efforts with 14 PDAMs. This paper focuses on work with three PDAMs, in Lombok Timur, Kudus, and Tasikmalaya. These PDAMs have developed comprehensive five-year business plans, achieved full cost recovery status, implemented GCG regimes, obtained licenses, developed preliminary engineering designs and environmental impact assessments, and conducted demand surveys. They are seeking Ministry of Finance approval to enter into commercial loan agreements with national and regional banks.

Lessons learned on working effectively with PDAMs include that endorsement, communication and coordination among all stakeholders, especially local and regional government, are essential. Technical issues relating to standardisation of demand surveys, licensing, and asset registries should also be addressed, and regular bank involvement and education throughout the lending process should be undertaken.

The scaling up of this programme, to allow more PDAMs to borrow funds to invest in new networks and connections, would play a key role in improving access to piped water in Indonesia.

Ready for Reform: Leading the Way to Financially Strong Water Companies

Local water companies must be financially healthy in order to access the financing needed so they can meet Millennium Development Goals for improved and expanded water provision. Good corporate governance, stakeholder buy-in, and sound tariff schemes are essential to this process

Ahmad Lanti

Over the last several decades, Indonesia's water service sector has experienced significant transition and transformation. Prior to 1968, only a few Indonesian cities owned public water supply enterprises (PDAMs), but that number has increased to well over 300 today. Private sector participation was introduced during the 1990s. 1997 brought the Asian Financial Crisis and subsequent economic and political reforms.

For several years after the financial crisis, the financial condition of most PDAMs deteriorated to the point where approximately five out of six had outstanding debt obligations to the Ministry of Finance (MoF) that were not serviced on time. In 2002, the Ministry of Public Works (MPW) found that only 27 PDAMs (9 percent of the total) were rated as "healthy," while 93 (31 percent) were classified as "less healthy" and the remaining 186 (60 percent) were rated as "unhealthy."

An installation owned by the PDAM in Klari, Karawang, West Java
Courtesy of PDAM Karawang

In 2007 and 2009, the MPW conducted performance assessments of all PDAMs using their 2002 performance as a baseline. The criteria used for the assessments included: level of development; loan management; asset management and replacement; debt service capacity; and internal revenue generation and profitability. Reform efforts led to measurable improvements, and by 2009, 140 PDAMs (42 percent) were rated as "healthy."

While the substantial increase in the number of PDAMs with healthy ratings is encouraging, there are many problems still to be addressed. In 2009, water service coverage in urban areas reached only approximately 30 percent of the estimated urban population of 120 million people. Current expenditure levels by PDAMs are not sufficient to properly maintain and operate their existing infrastructure and to invest in additional household connections. Additional funding is urgently required to improve services and to prevent further deterioration, but since the advent of decentralisation in 1999, traditional sources of public funding for PDAMs – central government grants and loans with subsidised interest rates – have drastically declined.

The Regulatory Framework for Water Provision

Law no. 22/1999 on Regional Autonomy transferred control of local investment to LGs and PDAMs. MoHA Regulation no. 43/2000 provided guidelines for regionally owned enterprises such as PDAMs to cooperate with third parties. To address financial constraints and the need to accelerate infrastructure development, the Government established a national level committee tasked with coordinating reforms and minimising constraints.

Law no. 7/2004 on Water Resources was issued to replace Law no. 11/1974 on Water Affairs. Subsequently, GoI also issued a number of important regulations related to water supply provision, such as Government Regulation no. 16/2005 on Water Supply Services Development (SPAM development), and Presidential Regulation no. 67/2005 concerning cooperation between GoI and business entities in the provision of infrastructure, including SPAM development. Two important Ministerial Regulations were also issued: Ministry of Public Works (MPW) Regulation no. 294/PRT/M/2005, on guidelines for development and provision of SPAM; and MoHA Regulation no. 23/2006 on technical guidelines and procedures for drinking water tariff adjustments/arrangements. To guide PDAMs in drawing up master plans, designs, and Environmental Impact Assessments, two MPW regulations were issued (no. 18/PRT/M/2007 and no. 10/PRT/M/2008).

To accelerate water provision in urban areas through PDAMs, the Ministry of Finance (MoF) issued Regulation no. 120/PMK.95/2008. This regulation made it a prerequisite for PDAMs to address debt restructuring in their business plans for 2009–2014, with penalties for failure to comply. It also stated that the implementation of PDAM business plans shall be audited and evaluated by the National Audit Agency on Financing and Development (BPKP) on a six-month basis.

Recently, Perpres 29 was issued to facilitate the midterm investment plans of PDAMs by subsidising (reducing) bank lending interest rates by 5 percentage points, and providing guarantees to banks to cover any non-performing loans. This Perpres was followed up by MPW Regulation no. 21/PRT/M/2009, which established guidelines for the feasibility of investment and borrowing, and MoF Regulation no. 229/2009, on guidelines and procedures for implementing Perpres 29.

Nonetheless, opportunities for the development of urban water supplies are enormous. Funding from sources such as loans from state-owned banks; Public Private Partnership projects; reductions in Non-Revenue Water (which now averages about 33 percent of all water supplied); greater efficiency with respect to capital and operating costs (CAPEX and OPEX); and tariff adjustments can help to improve cash flow generation and finance the required investment in rehabilitated and new infrastructure. Potential customers have indicated their willingness to pay provided that water service delivery can be improved and maintained properly.

These opportunities, if properly addressed through the application of good corporate governance (GCG) principles and with the

support of Local Governments (LGs) and parliaments, will enable PDAMs to improve their financial position. Under the UNDP's MDGs (Millennium Development Goals), the Government of Indonesia (GoI) has committed to halving the number of citizens without access to clean water from 2000 to 2015. To reach this goal, Indonesia's PDAMs must be financially sound, with access to the necessary funds for maintaining and expanding services.

Moving Toward Reform

In June 2009, the Directorate General of Human Settlements (DGHS) in the MPW coordinated with AusAID to develop an activity designed to assist up to 20 PDAMs throughout Indonesia to improve and accelerate their water delivery services. The activity is managed by the AusAID-funded Indonesia Infrastructure Initiative (IndII). It is intended to contribute to meeting the MDGs for 2015, and to enhance the delivery of piped water supply services to meet peoples' basic needs (estimated at 60 litres per person per day). These efforts dovetail with Presidential Regulation no. 29/2009 (Perpres 29) which seeks to enable PDAMs to access investment loans from commercial banks by providing central government loan guarantees which facilitate the provision of subsidised borrowing costs. (See box, "The Regulatory Framework for Water Provision.")

Under this activity, IndII provides technical assistance to selected PDAMs to ensure that PDAMs have the capacity to:

- Develop Preliminary Engineering Designs and UKL-UPL (environmental impact assessments).
- Conduct real demand surveys (RDS) in close collaboration with local universities.
- Analyse CAPEX requirements, develop full cost recovery (FCR) tariffs, and determine appropriate levels of commercial borrowings.
- Obtain water licenses (SIPPA) from the Directorate General of Water Resources (DGWR).
- Develop a business plan that complies with the requirements of commercial lenders for investment loans to accelerate infrastructure provision.
- Design a GCG regime and a staged plan for its implementation.

Current expenditure levels by PDAMs are not sufficient to properly maintain and operate their existing infrastructure and to invest in additional household connections.

- Present results to DGHS and in on-site workshops.
- Obtain umbrella agreements from the MoF as stipulated by Perpres 29.

Table 1: Projected Impact of Expanded Infrastructure

Location	Projected Impact	
	House Connections	People Served
1. Kabupaten Lombok Timur (Nusa Tenggara Barat)	26,000	130,000
2. Kabupaten Kudus (Central Java)	32,000	160,000
3. Kabupaten Tasikmalaya (West Java)	32,000	160,000

- Arrange subsidised debt financing from the national banking sector.

Selecting PDAMs to participate in the activity with IndII proved challenging due to constraints such as LG reluctance to move to FCR tariffs, limited PDAM management capacity, overlap with efforts by other donor agencies, and uncertainty over the exact assets held by some of the PDAMs. Ultimately, 14 PDAMs were identified as potentially suitable. This paper focuses on the work that has been undertaken with three of these PDAMs, in Lombok Timur, Kudus, and Tasikmalaya. These PDAMs have completed the process and developed comprehensive five-year commercial business plans which include FCR tariffs. They have also implemented GCG regimes, obtained SIPPA licenses, developed preliminary engineering designs and UKL-UPL assessments, conducted RDS, and are currently seeking MoF approval to enter into commercial loan agreements with national and regional banks. These loans will facilitate the expansion of their existing reticulation systems to provide more households with a reliable supply of good quality water. Table 1 shows the projected impact of expanded infrastructure in these three locations.

The ultimate goal is for participating PDAMs to achieve "healthy" status in all respects – financial, management, governance, and technical. With this newfound bankability, they can borrow to invest, enabling them to improve their infrastructure, coverage, and quality of water supply. Expected benefits include: (a) capacity building of PDAMs (at both the individual and work unit levels); (b) better access to clean water for citizens; (c) improvements in key policies related to PDAM business operation such as implementation of a proper tariff-setting policy; (d) development of new partnerships with AusAID (the Water Hibah[1] under the Water and Sanitation Initiative) and national banks; and (e) stronger business relationships between the PDAM and its key stakeholders (including the local governor, mayor/regent, DGHS, and the local House of Representatives [DPRD]).

Forging Strong Relationships

Thus far, the 11 other PDAMs working with IndII have developed preliminary reports and business plans, have conducted GCG analysis, are making strides in addressing the key financial and technical issues that they face, and are recommending steps to improve performance. Further progress will require the

Snapshot of a PDAM: The East Lombok Water Company

East Lombok is a dry region with low rainfall. The local water company (PDAM) is not yet able to provide services in the southern area of the kabupaten (regency). Citizens there have to buy jerry cans of water at the relatively expensive price of Rp 50,000 per cubic metre.

The East Lombok PDAM has a good track record of punctually repaying loans from the Ministry of Finance, and has received grants and incentives from the Government of Indonesia in acknowledgement of its good performance. As a participant in IndII's PDAM financial reform activity, the East Lombok PDAM has prepared a business plan that meets all requirements set forth in Perpres 29, and that should lead to an increase in the number of domestic connections of 24,000 within five years. The Regional Government has approved a proposed rate increase schedule for the next five years, and the current rate has reached full cost recovery status.

The PDAM's source of raw water for expansion is the Trengwilis Spring, located at the foot of Mt. Rinjani with an elevation of 669 metres above sea level and an intake capacity of 200 litres per second. The Directorate General of Water Resources began development in 2010 to channel water south using gravity. With the additional capacity this offers, the East Lombok Water Company will expand service coverage from 8.4 percent in 2008 to 16.7 percent of the kabupaten's population in 2014. Twenty-four hour service will be provided and the current level of leakage will be decreased. The new connections will increase revenue and transform the East Lombok PDAM from a small-scale water company to a medium one.

The improvements require an investment of nearly Rp 79.6 billion, financed through allocations, grants and incentives from the national and regional governments, PDAM resources, and loans from domestic banks in the amount of approximately Rp 11.2 billion. These loans will be used to finance the construction of distribution grids. – *By Elena Va, Senior Technical Advisor to IndII's PDAM Financial Reform Activity*

PDAMs to forge new relationships with several parties, including commercial and/or regional banks. In addition, they will need to enhance existing relationships with stakeholders such as provincial, regency and city governments; local parliaments; local planning agencies (Bappeda); and DGHS. The endorsement of these stakeholders will be required to develop and implement FCR tariff regimes and to secure bank loans for expansion efforts.

The partnership between PDAM management and its stakeholders should be developed within a framework of GCG principles. Supervisory boards should continue to monitor management functions, establish targets, and provide strategic direction and guidance as required. Mayors/regents and DPRD should consider and ratify necessary local regulations to provide clear operating guidelines for PDAM management and support investment plans.

Full Cost Recovery Is Essential

The importance of a sound water tariff structure in ensuring the health of PDAMs is difficult to overstate. Currently, the PDAMs in Lombok Timur, Kudus, and Tasikmalaya have achieved FCR status. Given the substantial capital expenditures needed to refurbish old piping and expand water supply, PDAMs must generate positive cash flows to service additional financing liabilities. Therefore, a robust water tariff adjustment scheme should be proposed. Stakeholders must have the discipline and commitment to maintain FCR through tariff adjustments while ensuring affordability. New local regulations might need to be issued to ensure such a framework, and this requires a solid political commitment. A strong "buy-in" from stakeholders is a prerequisite for a successful investment plan. In addition, it is important to have a commitment to reducing or abolishing the practice of extracting unnecessary and unrelated dividends from PDAMs where they occur in keeping with Ministry of Home Affairs regulations, until the coverage ratio has reached 80 percent of the populace.

As regional government-owned enterprises, PDAMs are subject to prevailing local regulations which have been stipulated and ratified by the DPRD and mayors/regents. With regard to policy setting and implementation, there are two crucial issues:

- Mayors/regents and DPRD must review any local regulations concerning PDAMs' organisational structure that involve reports by an internal auditor to the supervisory board.
- The detailed policies and procedures for business operations and internal controls that are developed by PDAM management must be aligned with prevailing local regulations.

Lessons Learned, Avoidable Risks

Work with the PDAMs has led to certain "lessons learned" and the identification of risks that can be mitigated when undertaking such efforts:

- Political support and endorsements by both central government and local leaders enhance the acceptance of reform efforts, water tariff increases, and water licenses.
- Coordination among stakeholders and PDAMs is vital. Regular meetings and updates help to ensure effective communication.
- PDAMs should consider a more aggressive and well targeted approach to: socialising the Perpres 29 programme; approaching Regional Development Banks as alternative loan sources; securing "political endorsement" from stakeholders (mainly from regional government); and capacity building through workshops, seminars, one-on-one discussions, and other forms of training.
- The data, analysis, and approaches to the RDS vary widely among regions. Since all subsequent planning efforts will be based on these RDS, they should be adjusted and standardised in the areas where inaccuracy is perceived.
- Technical inaccuracies may arise due to changes in pipeline locations; the features of water treatment plants or reservoirs; water supplies falling out of compliance with SIPPA,

etc. To minimise this risk, LGs should ensure that location permits are confirmed, that the SIPPA has been issued by the DGWR, and that asset registries are accurately maintained by PDAMs.

- Obtaining commitments from mayors/regents and DPRDs for debt financing through Perpres 29 involves a tedious and lengthy process. To ease the completion of this arduous task, the socialisation programme on the conditions imposed by PERPRES 29 must be undertaken with LGs and DPRDs beforehand.

- To facilitate financial closes with lending banks, regular bank involvement and education throughout the lending process should be undertaken.

The lessons above apply not only to the PDAMs currently working with IndII, but more generally to all PDAMs seeking to strengthen their operations and obtain a "healthy" rating. Attention to these matters, with an especially strong emphasis on GCG, stakeholder buy-in, and FCR, will prepare PDAMs to reach GoI's targets for improved and expanded water services to Indonesian citizens. ●

NOTES

1. The Water Hibah is a GoI initiative supported by AusAID that aims to provide drinking water to low income communities by offering incentive grants to PDAMs when they make new water service connections. To be eligible for the Water Hibah, PDAMs must have a "healthy" financial audit rating or be approved for participation in a debt-restructuring program, have spare drinking water production capacity, and have a sustainable drinking water management plan.

Author's Update

The efforts by the PDAMs in Lombok Timur, Kudus and Tasikmalaya have been approved by DGHS-MPW and their respective Local Governments. In accordance with the regulation, subsequent steps are MoF's umbrella agreement and debt financing engagement from the national bank. This may look simple but in fact it is tedious and lengthy procedures are still to be executed. The PDAMs in Lombok Timur and Tasikmalaya have completed final drafts of their debt financing from the national (BNI) and regional (BPJB) banks, and they are in line for MoF for issuance of the Umbrella Agreements. PDAM Kudus is apparently facing serious and unexpected problems related to reluctance to approve removing the Prawoto spring as a water source. However, new technical and business plans should be made with the source of water coming from the nearby Logung natural reservoir after obtaining a water license from the Provincial Government. It is expected that further assistance from IndII can be obtained in due time.

It has been jointly agreed by AusAID and MPW that any further PDAM assistance to be included in the IndII programme should meet prerequisites in term of water licenses and written support from the Local Government. Based on this approach, there are five PDAMs eligible to participate whilst the other six shall follow after fulfilling those requirements. In principle AusAID has accepted those five PDAMs and the Requests for Tender to the pre-qualified bidders were issued in December 2010 with a January 2011 closing date. Work is commencing from March, 2011 through June, 2011.

Table 2 shows the projected impact on the PDAMs due to the pertinent expanded infrastructure. ■

Table 2: Projected Impact of Expanded Infrastructure, Updated

Location	Projected Impact	
	House Connections	People Served
1. Kabupaten Kuning (West Java)	26,000	130,000
2. Kabupaten Banyumas (Central Java)	32,000	160,000
3. Kabupaten Klaten (Central Java)	32,000	160,000
4. Kota Pekalongan (Central Java)	22,000	110,000
5. Kabupaten Karawang (West Java)	36,000	180,000

About the author:

Ahmad Lanti has been the project manager of IndII's PDAM financial reform activity since July 2009.

He has 34 years of experience as a government officer, mostly in the Ministry of Public Works (MPW). He has been assigned to a number of important positions, such as Project Manager of drainage and flood control for Jakarta; Director of Jakarta Metropolitan Public Works; Director of Housing within the Directorate General of Human Settlements (DGHS) of MPW; Secretary of DGHS; Assistant to the Minister of Public Works; and Director General of Research & Development at MPW.

After his retirement as a civil servant in 2002, he was publicly selected by the Governor of Jakarta as the first-ever Chairman of the Independent Regulatory Body for Water Supply Concession Contracts in Jakarta, a position he held from 2002 to 2009.

In 2007, he proposed to the Vice President of Indonesia an integrated solution to relieve Central Jakarta from flooding, traffic congestion and wastewater/sewerage problems. This concept, with a double-deck deep tunnel 12m in diameter and a total length of about 22km, was well known as the "Multi Purpose Deep Tunnel".

He was honoured with three decorations by the President of Indonesia, in 1987, 1993 and 1998. In 1995 he was selected as one of the top three participants during a 10-month Ministry of Defence course on National Resilience. He is also a distinguished 2009 alumnus of the Asian Institute of Technology.

He was one of the founders of the East Asia Pacific Infrastructure Regulatory Forum and its Deputy Chairman from 2006 to 2009, as well as a member, on a number of occasions, of Government negotiation teams to the International Bank for Reconstruction and Development and the Asian Development Bank.

He is the author of *A Regulatory Approach to the Jakarta Water Supply Concession Contracts* (Routledge, London and New York, 2006).

KEY POINTS *on Community-Based Organisations*

Since the 1990s, Community-Based Organisations (CBOs) have managed water supply systems built by government or donors, expanding service coverage and demonstrating that CBOs have an ongoing role to play in expanding access to improved water. CBOs offer citizens local ownership and enjoy the trust of customers. Citizens are willing to pay to connect, and if offered quality and reliability are willing to pay more than they now do. Most CBOs have borrowing capacities of Rp 12 to 400 million, but lack access to commercial credit. To obtain credit, and set the stage for expanding services, CBOs must professionalise, formalise, register as legal entities, and obtain business licenses.

A project entitled "Upgrading Community-Based Piped Water Services with Private Sector Support" is assisting CBOs to make the leap from a "first generation" informal organisation to a professionally managed undertaking that has the capacity to access commercial credit and oversee the expansion of infrastructure and services. Under this model, CBOs can finance additional investments through the market, and then receive output-based rewards for performance.

So far, 30 CBOs from East and West Java have participated in skills enhancement through the project, using tools to invite community participation in planning, upgrading knowledge on engineering design and maintenance, and adopting a financial recording and reporting system. In the next phase, private sector participation will be introduced. Some of the options under consideration as means to create partnerships with the private sector include fee-based technical support, management support contracts, and arranging private sector co-financing/ investment partners.

The Second Generation Project faces a formidable challenge. A fundamental issue is how an informal association transforms into a formal one, a move that may not make sense to a group that has successfully functioned informally for years. Likewise there is the difficulty of formalising the treatment of start-up capital/assets held by the community. Efforts to obtain proper permits and licenses may meet with bureaucratic obstacles. While the advantages of formalising are many, all attempts to assist CBOs must be cognisant of these difficulties.

Harnessing the Power of Community-Based Organisations

Water services managed by community-based organisations can reach rural inhabitants out of the range of local water companies, but in order to reach their potential they must formalise operations and access commercial credit – steps that present daunting challenges.

Jemima Sy

Over half (52 percent) of Indonesia's 64,000 rural villages lack access to improved water systems. The reach of local water companies (PDAMs) does not extend far enough to provide piped water in these areas. Since the 1990s, the Government of Indonesia (GoI) has encouraged the formation of Community-Based Organisations (CBOs) as a means for bringing piped water to rural citizens. Their successes demonstrate that CBOs have an ongoing role to play in expanding

A community organisation meets in West Java. *Courtesy of ESP Indonesia*

access to improved water. Now is the time to help CBOs move beyond their initial efforts and achieve their full potential to provide rural water services. But the complexity of this challenge should not be underestimated.

What are CBOs? They are usually informal groups of local residents, often brought together by aid projects, that manage water supply systems built in their communities by government or donors. They become the operations and management team. Most Indonesian CBOs were formed in the 1990s and early 2000s, before any regulatory framework for their functioning existed. Government Regulation no. 16/2005, which gives legal recognition to CBOs, was an acknowledgement of their usefulness.

A study by the World Bank's Water and Sanitation Program (WSP) of CBOs in five districts in West and East Java[1] found that they provide a far-reaching service – catering to an average of 1200 persons (approximately 260 households) per organisation. In these five districts alone, CBOs are serving up to 800,000 people with piped water, which represents about 7 percent of the total population in those districts. In Blitar, CBOs serve three times more households than the PDAM does.

CBOs offer citizens local ownership, which can be harnessed to ensure better operation and maintenance. When CBOs perform exceptionally well, they can operate the infrastructure to generate value and expand services. Moreover, the World Bank study affirmed that CBOs enjoy the trust of customers, who agreed that CBOs were responsive to them in managing repairs, billing and collecting payments, and in maintaining funds honestly. Many of those currently not connected to the service are also willing to connect, whether through outright payment of the current charge (50 percent of surveyed respondents) or by instalments (80 percent).

Citizens are willing to pay for the water that CBOs can provide. The WSP gave customers a scenario under which they receive reliable water services with good pressure and asked what they would pay for it. The investigation[2] found that customers are willing to pay between 30 and 300 percent more in water tariffs than they currently do.

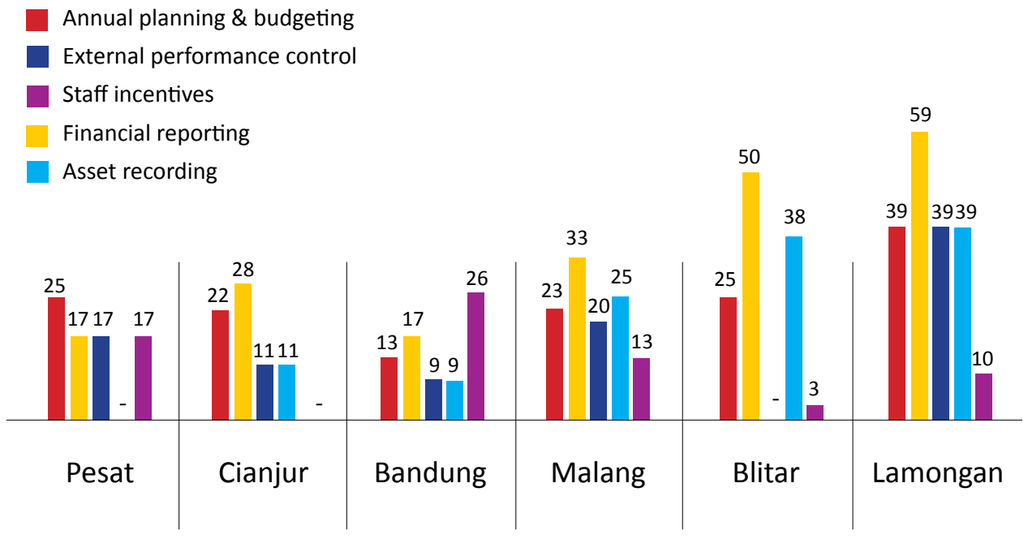
Both Need and Opportunity

But the same investigation revealed customers' dissatisfaction with the current pressure and reliability of water supply; over 60 percent of respondents noted this was a problem. Pressure and reliability generally drop for two reasons. First, residents who are charged a flat fee use water injudiciously. Second, CBOs have added connections, leading to increased water withdrawal rates, without making the necessary structural adjustments such as changing pipe sizes and increasing pump capacities.

Clearly, CBOs have both the opportunity and the need to expand their services. Most CBOs (67 percent) make more than they spend, so they are able to build up additional equity. Expense-to-revenue ratios can be as low as 40 percent in some cases. Thus, using current commercial terms for investment finance, CBOs have borrowing capacities of Rp 12 to 400 million[3] – if only someone will lend to them. Without access to commercial credit, CBOs have limited options for finance: they must wait to build up funds ever so slowly, borrow against the personal credit of one of the leaders, or beg from government.

The challenge of gaining access to finance goes hand-in-hand with the need of CBOs to professionalise their operations. Expansion requires improved commercial practices beyond what CBOs currently might be able to arrange. An increase in the number of customers, for example, will require improved billing and collection practices and continuous business and investment planning. But according to an assessment of five organisational practice areas, the overwhelming number of CBOs do not have systems in place for annual planning and budgeting, external performance control, staff incentives (most are volunteers), financial reporting, and asset recording. (See Figure 1.)

Figure 1: CBOs With Organisational Systems in Place, By Percent



To support the ability to secure debt financing, CBOs need to improve their financial recording and reporting. This will help both the CBO and its financer to accurately see the financial status of the business. Such improvements require that the CBO improve overall organisational systems: how it decides; how it operates; how it recruits and retains human resources; and how it generates support for customers, the community and other stakeholders. It usually means that the CBO must formalise, registering itself as a legal entity and obtaining proper business licenses.

Helping CBOs to Transform

A project entitled "Upgrading Community-Based Piped Water Services with Private Sector Support" is now assisting CBOs to make the leap from a "first generation" informal organisation to a professionally managed undertaking that has the capacity to access commercial credit and oversee the expansion of infrastructure and services. Informally known as the "Second Generation Project," the effort is a joint endeavour among the AusAID-funded Indonesia Infrastructure Initiative (IndII), the Ministry of Public Works, Bappenas and the WSP. This project complements current GoI efforts to upgrade village water infrastructure, which remain focused on the initial challenges of building water supply systems and organising communities to operate them. In contrast, the Second Generation Project addresses the question of scaling up from those initial systems by introducing private sector-based support systems.

The project is partnering with Bank Negara Indonesia (BNI) to enhance CBO access to investment financing. First generation financing has generally been in the form of public grants, but under the second generation model CBOs can finance additional investments through the market, and then receive output-based rewards for performance. IndII facilitates CBOs to borrow 70 percent of needed investment funds from BNI. The remaining 30 percent is put up by the CBO through their own equity (20 percent) and a grant from IndII (10 percent). Performance targets that cover both operational and financial criteria are established – if the CBO meets these at the end of construction, the project pays down one-half of the loan principal. Thus, the CBO is paying for at least 55 percent of the investment (half of the 70 percent borrowed, plus its 20 percent equity share), compared to typical government or NGO-financed projects in which 80 to 100 percent of project costs are covered by grants.

This reliance on commercial funding and output-based rewards is designed to introduce market discipline to CBOs and ensure that funding supplies are sustainable. To be eligible for participation, CBOs must professionalise, establish a proper legal foundation, obtain business licenses, and demonstrate credit-worthiness through realistic tariffs, sound systems for collection, and proper management. (See Figure 2 for a roadmap showing the progression from first to second generation.)

So far, 30 CBOs from East and West Java have participated in skills enhancement through the project, learning to use tools for inviting community participation in planning, upgrading their knowledge on water supply system engineering design and maintenance, and adopting a financial recording and reporting system designed by the WSP for CBOs. For some individuals participating, it was their first time to use a computer, but despite the relatively difficult nature of the material, trainees were highly engaged and appreciative of their new learning. Participating CBOs are now designing, with project engineers, the required components of their investments projects.

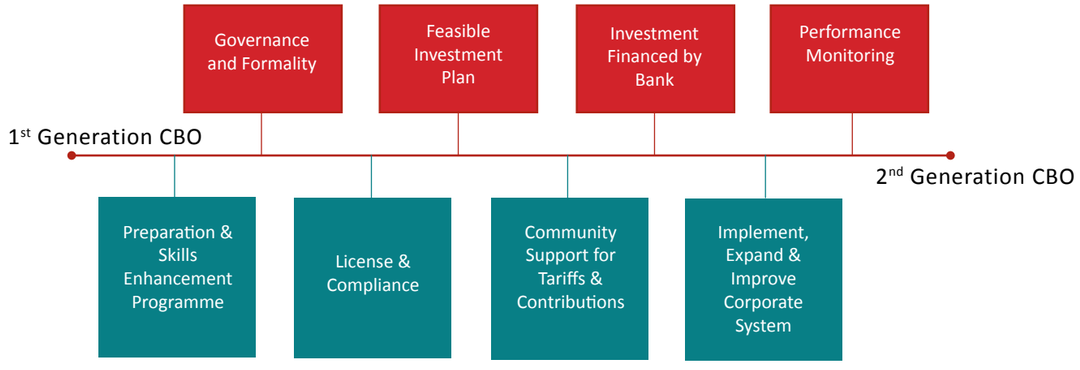
In the next phase of the project, private sector participation will be introduced to help CBOs improve performance and creditworthiness. This phase will begin with an options study to explore alternatives to traditional capacity-building techniques, followed by a pilot test in two districts. Some of the options under consideration as means to create partnerships with the private sector include fee-based technical support, management support contracts, and arranging private sector co-financing/investment partners.

In both the initial skill-building phase and the follow-on phase to secure private sector participation, commitment by the Local Government (LG) is critical if the results achieved are to be sustainable. The LG's role is one of oversight rather than direct implementation. The project is introducing licensing agreements between LGs and CBOs, which include benchmarks for performance monitoring. Dialogue continues on LG roles and responsibilities in licensing and enabling CBOs to expand through private sector mechanisms.

From Informal to Formal, But How?

The Second Generation Project faces a formidable challenge. There is no straightforward roadmap available for CBOs that want to move from first to second generation institutions. Much lip service is given to promoting self-reliance and best practices, but this does not automatically translate into clearcut policies and procedures for CBOs to adopt.

Figure 2: From First to Second Generation



A fundamental issue is how an informal association transforms into a formal one. For example, how should the "founding members" or incorporators be defined? Once they are identified, what will this mean in the future for everyone who has put time and effort into the enterprise? The requirements for explicit definitions, systems and procedures like these may not make sense to a group that has functioned successfully on an informal basis for years.

Likewise there is the difficulty of formalising the treatment of start-up capital/assets held by the community as an informal association, and generated by its members through their labour and enterprise following the initial investment. The existing regulatory framework for government property and accounting systems does not properly address the status of ownership and rights in situations like these.

Even when CBOs are equipped to surmount these hurdles, further complications remain. Many CBOs exist today without permits to draw water or operate a water supply system. In a number of instances where CBOs tried to do the right thing and seek out the licenses, they met daunting bureaucratic obstacles, uneconomically high fees, or even requests for bribes. Because the rule of law is not straightforward and CBOs may have difficulty in properly accounting for their revenues and expenditures, village governments may expect payments based on gross revenues without taking into account expenses, interest and depreciation. Understandably, these disincentives push CBOs to stay out of or step out from the system.

The advantages to CBOs of formalising their operations and implementing improved organisational systems are obvious. Along with the increased opportunities to expand and improve services, a professional and legally compliant structure mitigates their possible exploitation, minimises risk exposure, and secures for the members a more predictable and transparent management of their increasing assets. CBOs will be able to ring-fence themselves as an enterprise that is for the community, of the community and by the community. The irony for now, however, is that in trying to achieve these goals, CBOs are made vulnerable because they have not already achieved them in the past. The Second Generation Project and any similar efforts that are initiated will need to be fully cognisant of this reality. ●

NOTES

1. The Multi-Village Pooling Project baseline study assessed 171 CBOs representing 25 percent of over 600 known CBOs existing in the districts of Bandung, Cianjur, Lamongan, Malang and Blitar.

2. Water and Sanitation Program and Akademika, Willingness-to-Pay for Community-Based Water Supply Services in West and East Java. *2009.*

3. Assumes a debt-service coverage ratio of unity, an annual interest rate of 18 percent, and three years to pay.

About the author:
Jemima Sy has worked over the last five years in the World Bank Jakarta office as a Water and Sanitation Specialist. A lawyer by training, she has over 10 years' experience managing water and sanitation initiatives focused on institutional reforms, entrepreneur development, and public and private financing. She leads the team implementing the Second Generation Project.

Author's Update

The "Upgrading Community-Based Piped Water Services with Private Sector Support" project continues to make progress. The next phase of the project is underway, with private sector participation now being explored.

One factor that has come to light during subsequent efforts is that although there are some CBOs with borrowing capacities of Rp 12 million or higher, there are also a number that have not yet reached that level.

Since the original publication of this article, 24 CBOs have submitted proposals for investment funding to the partner bank, Bank Negara Indonesia (BNI) – a significant accomplishment that reflects the commitment and enthusiasm of CBO members. At the time this update was prepared, 15 of the proposals had been appraised by BNI, with 11 proceeding to the second stage of credit evaluation. ■

KEY POINTS *on a Jatiluhur–Jakarta Pipeline*

Without significant intervention, Jakarta and its surrounding areas might be partially reliant on trucked water within three years. Demand is expected to increase to almost 900,000 m^3/day by 2012, and the current waiting list for new connections is about 60,000 households. Among the options for ameliorating this situation is a pipeline that would draw on supplies from the Jatiluhur reservoir, approximately 65 kilometres from the capital city. A pre-feasibility study of the viability of this option examined supply and demand fundamentals; possible locations for drawing, processing and transporting water; and the legislative framework. Extensive meetings were held with stakeholders including water companies, government agencies, and water professionals. The study concluded that the three major areas that must be addressed are commercial, engineering, and legal framework considerations.

From a commercial standpoint, there are at least 38 potentially impacted stakeholders who need to be involved, and no clear single authority with declared ownership of the project. Varying performance by stakeholders; varying distribution, quality, and maintenance of pipes; needed but unbudgeted investments; and tariff setting are also matters that will need to be addressed.

The primary engineering variables are the location of the water treatment plant, selecting among route options, and the reservoir access point. These variables alone suggest 36 possible configurations; there are more when variables such as staging options are included. All have benefits and drawbacks.

From a legal framework perspective, the current concessionaire's agreement is in need of revision. Further, there is ambiguity surrounding the final ownership structure of the proposed pipeline.

The pipeline has strong fundamentals. The study recommends that if the pipeline is built, variables should be pared to bare essentials; stakeholders should be closely involved to align expectations; a full technical, financial and legal feasibility study should be conducted; and a sound and sophisticated business case should be developed to present to investors.

Proposing a Jatiluhur–Jakarta Pipeline

Without intervention, Jakarta faces the possibility of a significant water shortfall in coming years. Development of a Jatiluhur–Jakarta pipeline may offer a solution.

Mark Switkowski

The infrastructure challenges facing Jakarta are symptomatic of a fast growing economy in an expanding market. The Government of Indonesia has demonstrated its ambition and motivation to address these challenges and, in particular, the desire to provide increased access for the population to high quality piped water.

In a worst case scenario, and without significant intervention, it is quite conceivable that Jakarta and its surrounding areas might be partially reliant on trucked water within three years.

The water supply shortfall is primarily due to two reasons: alteration of the current canal

Jatiluhur reservoir
Courtesy of Hullie on Wikimedia

distribution model to serve outlying areas; and failure of water production and distribution to keep pace with both population growth and Jakarta's ever-expanding urban sprawl.

Most residents within Jakarta experience the downstream effects of this shortfall every day. Many households utilise wells to meet their daily water requirements and rely upon Jakarta's canal system to dispose of wastewater. The unfortunate reality is that these two systems are inextricably interlinked. Household wastewater and storm water collect in the canal system and progressively seep into the surrounding water table. This water is then tapped by households and businesses (via their wells) and used for everyday activities.

Discussions with Jakarta's two water producers, Palyja and Aetra, indicate that the sum total of the water demand is currently about 775,000 m^3/day and is expected to increase to almost 900,000 m^3/day by 2012. These producers also declare that the current waiting list for new connections is about 60,000 households. The two concessionaires produce approximately 2,000,000 m^3/day, albeit with more than 50 percent Non-Revenue Water (i.e. water loss due to broken pipes). Consequently, the two concessionaires are only just meeting current water demand with the existing water supply. Should the supply be reduced, due to reallocation of resources, then the water situation in Jakarta could rapidly change from manageable to desperate.

More than half the water currently in the reservoir is channelled to the ocean as wastewater and is not utilised in any obvious manner.

This is a difficult situation. However, there is a solution. Through various Governmental initiatives, and with the assistance of the AusAID-funded Indonesia Infrastructure Initiative (IndII), a number of options for increasing the water availability to both households and businesses have been identified.

Recently, IndII commissioned the "Pre-Feasibility Study as to the viability of a Jatiluhur to Jakarta Water Pipeline", which was completed in March 2010. This study was conducted by a consortium comprised of: KPMG (commercial and financial consultants); GHD (consulting engineers); and Makarim & Taira (legal counsel).

Potential to Meet Shortfalls

Jatiluhur dam is located approximately 65 kilometres from Jakarta. Its reservoir has the potential to provide high quality raw water to meet any anticipated baseload shortfall. The dam is primarily used to supply irrigation to nearby areas and small amounts of water for daily usage. Current water usage from the reservoir is approximately 6 billion m^3/year. Jakarta's additional requirements to meet future water supply gaps would represent less than 10 percent of its current capacity throughput. Furthermore, more than half the water currently in the reservoir is channelled to the ocean as wastewater and is not utilised in any obvious manner.

The main objective of the study was to understand the mechanics of how to answer the following three questions:

- Are the supply and demand fundamentals strong?
- Where are the possible locations for drawing, processing and transporting water from the Jatiluhur dam?
- What is the legislative framework within which the project must operate?

During this feasibility study, extensive meetings were held with Palyja and Aetra, government agencies (local water companies of Karawang, Bekasi Kota, and Bekasi Kabupaten; State-owned water company Perum Jasa II; and Bappenas), and with external water professionals.

The key thought outcomes of these meetings fit into three broad themes: commercial, engineering, and legal framework considerations.

Commercial Considerations

During the initial scan, it was found that there are at a minimum 38 potentially impacted stakeholders who need to be consulted, heard and involved where appropriate in any future Jatiluhur–Jakarta pipeline. Compounding this immense consultative task, there is no clear single authority that has declared ownership of the project.

In addition, it appears that virtually all direct stakeholders have a range of performance and other issues in their existing operations. Current distribution pipes are of varying quality and repair throughout the service area. In order to distribute drinking water to current (and new) customers, new pipes need to be laid which will require significant additional (and in many cases, unbudgeted) investment.

Tariff setting was also flagged as a key consideration. It is currently perceived that water prices (tariffs) are set without deep consideration of the economic drivers that traditionally form the foundation of any tariff decisions. In the past, this has caused a misalignment of expectations when determining levels of investment required and subsequent payback periods. This remains a risk for any future projects.

Engineering Considerations

With respect to the design and construction of this proposed pipeline, there are three main variables to consider:

- *Water treatment plant location* – There are four possibilities ranging from close to the drawing point through to a Jakarta-based solution.
- *Route options* – Three have been identified: utilising existing canals, the tollway or across farmland.
- *Reservoir access point* – There are three options and the decision depends on financial and water quality/quantity criteria.

With only these three areas of consideration (and there are others, such as staging options, etc.) there are still 36 distinct options for consideration. All have their specific benefits and drawbacks, all with varying financial and legal implications.

Despite the challenges associated with the mechanics of drawing water from the dam, greater concerns exist at a macro level, particularly ensuring that the existing infrastructure can cope with the additional pressure/load associated with the proposed pipeline.

Legal Framework Considerations

Finally, the current concessionaire's agreement is in need of extensive revision. The current agreement is thought to be a key driver for the lack of water infrastructure currently available to Jakarta. Through the process of renewing this agreement, considerations of the current infrastructure requirements can be incorporated, thus positioning the concessionaires to best service their customers (by increasing capital investment) with the water provided by the Jatiluhur dam.

In addition to the above, the final key consideration that the study highlighted was the ambiguity surrounding the final ownership structure of the proposed pipeline. This, in itself, is symptomatic of a legislative environment that is new for Public Private Partnership (PPP)-style projects.

Where to From Here?

The proposed Jatiluhur to Jakarta water pipeline has strong fundamentals. There is available water of reasonable quality (and quantity) in the dam and Jakarta will need a new baseload source in the near future. The engineering of transporting water is established and Indonesia has a long history of successfully providing water to its constituents.

Understanding that this pipeline *should* be built, it was recommended the following steps be followed:

1. Pare back the pipeline variables to the bare essentials
2. Work closely with Government agencies and other stakeholders to assure alignment and to ensure that expectations are met
3. Conduct a full technical, financial and legal feasibility study
4. Strengthen (existing, if appropriate) PPP frameworks
5. Construct a workable and sophisticated business case to take to the Indonesian Government, institutions and international banking agencies so that funding can be acquired and construction can commence. •

About the author:
Mark Switkowski is a Technical Advisor for KPMG Indonesia, working as part of the Infrastructure and Projects Group. His recent experience includes corporate advisory assistance for water, energy and other infrastructure-related projects, both in Indonesia and in Australia.

KEY POINTS *on Water Governance in Nusa Tenggara*

The Nusa Tenggara Water Governance Project is assisting local water companies (PDAMs) by helping them to improve their external environment, in particular the manner in which local governments (LGs) and PDAMs interact. This new approach is necessary because decentralisation has changed the landscape. Previously, central government played a large role in the financing and construction of water supply infrastructure, but as those contributions have decreased, LGs have not stepped up to replace them. LGs are reluctant to invest directly in PDAMs, believing that this would not result in improved services.

Those few PDAMs that operate successfully have escaped this mindset and have been able to foster partnerships among the LG, legislature and community. Common denominators are trust by the LG in the PDAM; awareness by government and the PDAM of community needs; open dialogue with the legislature; and management of the PDAM through mutually agreed objectives.

The Indonesia Infrastructure Initiative is working in Nusa Tenggara Timur (NTT) and Nusa Tenggara Barat (NTB) to replicate these conditions and trigger the conditions necessary for PDAMs to achieve long term success.

The NTT-NTB Water Governance Activity has two stages: Stage 1 is the identification of stakeholder expectations and formulation of stakeholder agreements, while Stage 2 is the implementation of commitments. Stage 1 is an iterative process whereby the PDAM and LG share their perspectives and agree to take reciprocal actions that build trust and improve operations through a "social contract" for water supply governance. The activity does not deal directly with the legislature, leaving that to the LG, but community engagement is fostered through developing an active and transparent PDAM Oversight Body.

Stage 1 culminated in a workshop where stakeholders from 12 LGs and PDAMs agreed to reciprocal actions. LGs submitted proposals for further action and assistance in implementing social contracts; five of these were selected, and Stage 2 began as this article first went to press.

Better Governance for Better Water Services

A new approach to improving infrastructure and service delivery focuses on encouraging local governments and water companies to develop shared goals and commitments.

Jim Coucouvinis

The Nusa Tenggara Water Governance Project is taking a novel approach to enhancing the performance of local water companies (PDAMs): attempting to improve their performance without assisting them directly.

Why is a new approach necessary? Because the legislation that underpins Indonesia's decentralisation has completely changed the way that local governments (LGs) govern and deliver services. Development assistance agencies and multilateral

A leaky water valve in Maumere illustrates the need for maintaining and improving infrastructure.
Courtesy of PDAM Maumere

banks have also been forced to rethink the framework of their assistance. Pre-decentralisation methods are no longer relevant. The challenge is to find strategies that fit the new realities.

The Nusa Tenggara region has been receiving considerable assistance from AusAID and other donors for more than 20 years. Past programmes addressed water sector problems directly. Typically, this involved expansion of water system facilities, training of PDAM staff, support to accounting and water billing systems, and similar interventions. Within the context of decentralisation, such improvements have proved difficult to sustain and PDAMs have been slow to initiate further improvements from within.

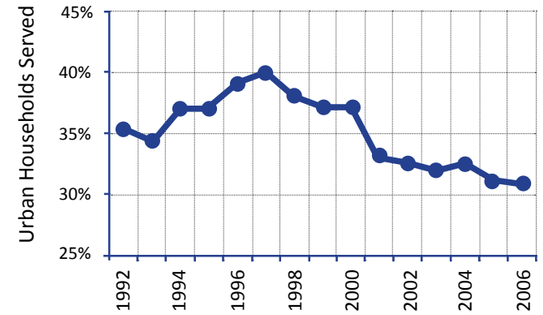
In the current landscape, the main factors affecting PDAM performance are its relationships with stakeholders (the LG, the community and the legislature) and its governance arrangements – in other words, the external environment. We believe that focusing on this external environment is the key to achieving sustainable improvements to the water sector under decentralised government. If it is successful, the Nusa Tenggara Water Governance Project will point the way to meaningful change in how LGs deliver water services.

To see how we expect this to happen, we first need to ask what ails the water supply sector. Statistics show that the sector is indeed sickly. The percentage of households in cities and towns that are served by piped water declined from 40 percent in 1997 to 31 percent in 2006 (see Figure 1). Investments in water supply have not only failed to keep pace with urban growth, but have fallen sharply since decentralisation.

Prior to current decentralised arrangements, the central government was largely[1] responsible for the financing and construction of water supply infrastructure at the local level. After the monetary crisis in 1997 and subsequent decentralisation, central government investments stopped, but LGs did not step in to fill the investment gap as they were supposed to. Prior to 1997, annual investments by central government were many times higher than current investment levels in the sector. LG accounts for 2007 show that they invested only 0.37 percent of their budgets as equity in their PDAMs.

Why are LGs not investing in their PDAMs? Their priority is spending money on the services they provide directly through LG departments (Dinas). Diverting funds to invest in the PDAM is, in most

Figure 1: Decline of Water Service After Decentralisation



cases, not even a consideration. When asked why, the reason most mayors and regents give is that the PDAM is a commercial enterprise and should be self-financing – despite the legislative obligation that LGs have to ensure their constituents have access to acceptable water services.

However, not all LGs have such a mindset; some have recognised their obligation to provide adequate access to water. These LGs are the new champions of water supply development. The manner in which they have responded to the need for improved water services forms the foundation on which our activity is structured.

Lessons From Rare Successes

There are about 350 PDAMs in Indonesia, only a few of which have achieved success in water service delivery. These PDAMs have succeeded by fostering partnerships among the LG, the local legislature (DPRD), and the community. Central government departments and development

agencies have studied these rare successes to understand how they happen and why they are so unusual. These studies have found that a common denominator amongst these LGs is how governance is manifested. Of particular importance are: the trust by the LG in the PDAM; awareness by government and the PDAM of community needs; open dialogue with the legislature; and management of the PDAM through mutually agreed objectives.

Admittedly, this is a simplification. However, successful PDAMs do share a common set of governance criteria even though they have significant differences on other fronts. For example, public pressure resulting from water shortages has forced some LGs to support their PDAMs. But even where there is no water shortage, a few LGs have led the way toward water governance reform. Clearly, technical and operational issues are not the overriding factors.

The Activity Takes Shape

At the outset of its work in the water sector, the Indonesia Infrastructure Initiative (IndII) received a large number of requests for assistance from LGs in Nusa Tenggara Timor (NTT) and Nusa Tenggara Barat (NTB). IndII, a facility funded by AusAID, dispatched a team to the field to evaluate the proposals and requests from LGs and formulate an activity in response. As expected, our team identified a bewildering array of problems and widely differing proposals for assistance.

But there was one remarkably consistent theme: clear evidence of a lack of mutual trust between the PDAMs and their owners, the LGs. The PDAMs complained that LGs did not understand their problems, while LGs complained that PDAMs did not respond to LG needs. If the LG allocated any of its own budget to water supply, the mayors and regents almost exclusively spent the money through their public works Dinas, which in turn transferred the completed works to the PDAM to operate. Notably, the handful of star-performing LGs were exceptions to this rule: they invariably invested their budget funds directly in their PDAMs to finance capital expansion – a clear show of trust in the PDAMs.

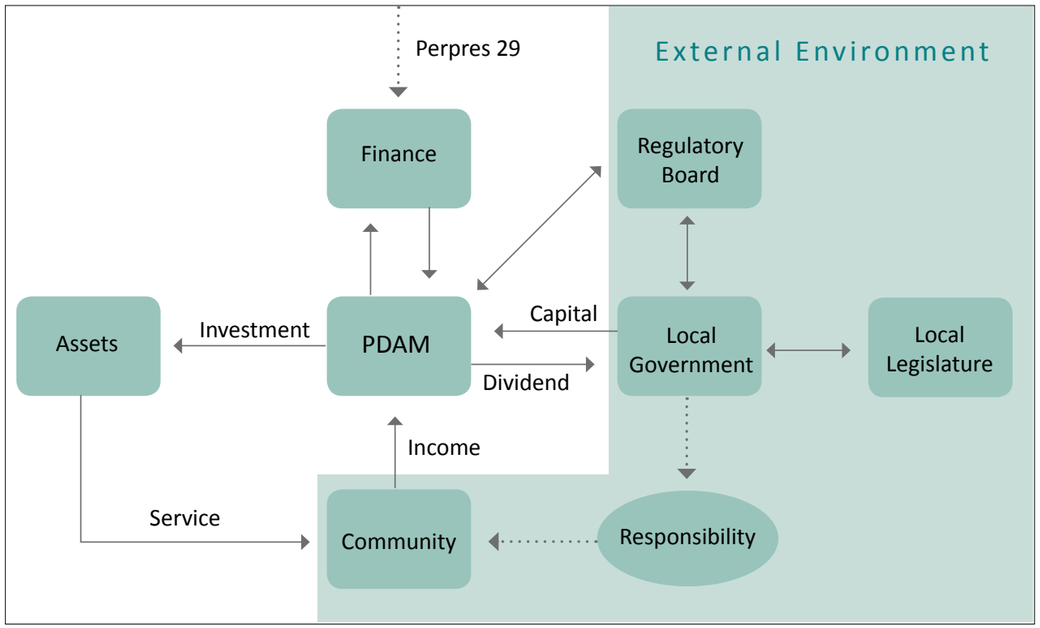
Now we could see IndII's activity taking shape. We wondered if we could replicate the conditions of the external environment that were common to the few successful PDAMs. Assisting other NTT and NTB local governments to interact with their PDAMs in the same way could trigger the conditions necessary for PDAMs to achieve long term success.

A Two-Stage Process

We started by defining our objective: to establish governance arrangements in the external environments of PDAMs that would lead to sustainable improvements (see Figure 2). We had to identify the conditions necessary to establish a functional external environment and foster mutual trust among stakeholders. The activity was designed with two distinct stages. Stage 1 is the identification of stakeholder expectations and formulation of stakeholder agreements. Stage 2 is the implementation of the stakeholder commitments.

Stage 1 began with establishing mutual understanding among stakeholders about each other's concerns. For example, a PDAM wants a tariff increase to better operate and expand their facilities but the LG is suspicious that a tariff increase would finance increases in salaries and purchases of consumables, with little improvement in service

Figure 2: The External Environment of the PDAM



levels – historically, an all-too-frequent outcome. As another example, a PDAM says it needs to build a new water main to serve a growing community outside its present distribution system; the LG agrees, but funds its Public Works Dinas, which builds the pipeline and transfers the assets to the PDAM. The PDAM complains of shoddy work and overpriced contracts, and is reluctant to accept the assets at the contract value. This is also a very common outcome.

Establishing mutual understanding in such circumstances can be a lengthy and arduous procedure. Each party is more likely to be frank and truthful in the absence of the others. Eventually, with IndII serving as a go-between and patient listener, the parties can be brought together to openly state their perspective. The process can then be repeated as needed.

Once the stakeholders understand each other's point of view, the next step is to build trust by setting mutually agreed objectives – "I'll do this if you do that", or "I'll give you this if you do that". The LG should take the lead at this point, agreeing to a PDAM request but requiring a reciprocal action

from the PDAM. For example, the LG agrees to a tariff increase and the PDAM agrees to increase water delivery from 6 to 12 hours per day. This is an iterative process. Next, for example, the LG may agree to appoint PDAM directors in accordance with the national government's directive for "fit and proper" tests, in return for which the PDAM may agree to achieve better results on their next financial audit. There are many such scenarios that lead to greater trust and enhanced motivation to perform well.

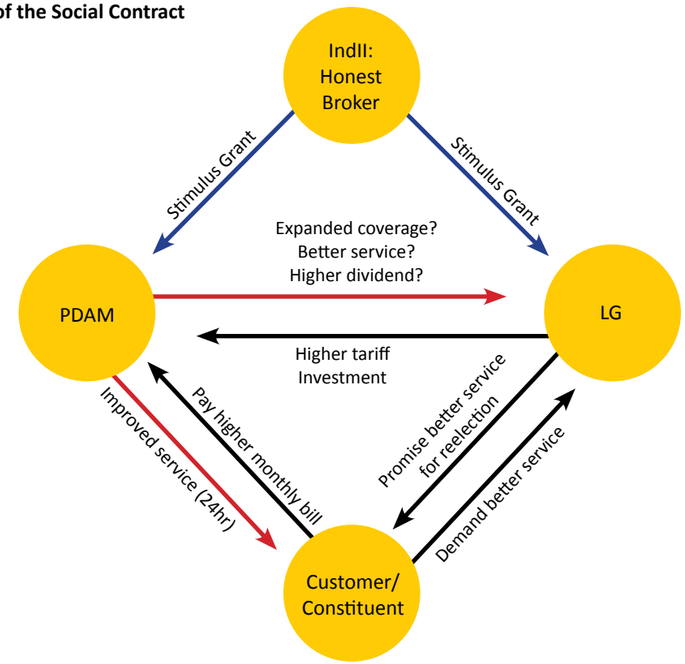
We named these agreements between the stakeholders a "social contract" for water governance, in acknowledgement of the social obligation of the LG to provide access to water services to its constituents.

In practice, the social contract is not limited to the LG and the PDAM (see Figure 3). The roles of other parties – the community, the DPRD and IndII – are worth a closer look.

The Community and the Legislature

In theory, the legislature is the elected representative of the community, a view that legislators and community members increasingly share. Our experience has demonstrated that a successful approach is for PDAMs to take responsibility for communicating with the community, while the local LG develops relationships with the DPRD. There are cross linkages, of course, but by and large we have assumed that the LG needs to involve the legislature but that this is outside the scope of this project.

Figure 3: The Linkages of the Social Contract



The community, however, is a direct stakeholder that cannot be ignored. The most practical point of engagement with the community seems to be the PDAM Oversight Body. This body is mandated by government regulation and has membership from the LG and the local tertiary education institution, along with a consumer representative.

In our experience, the level of activity and transparency of the Oversight Body is a good proxy for the level of engagement with the community and a reasonable measure of the level of governance being exercised by the LG. For example, in the City of Bogor, the Oversight Body meets weekly and reports its findings. In most of the NTT and NTB PDAMs, the Oversight Body meets once a year, and in some cases has not met at all. These bodies have evidently been established to comply with the letter of government regulations, but the spirit has been ignored. It is thus no surprise that activating and strengthening the Oversight Bodies has been one of the activity's key objectives, and a common component of nearly all of the social contracts.

The community is a direct stakeholder that cannot be ignored.

The Role of IndII

IndII's role is to facilitate the identification of all stakeholders' objectives and their agreement to reciprocal actions. IndII is positioned as an impartial "honest broker" to guide the stakeholders in arriving at the social contract.

A further role of IndII is to provide limited direct assistance and rewards as each of the parties achieves their goals. This assistance is limited in scope but is strategically important because it fills gaps in the capability of the local governments and the PDAMs. For example, we anticipate that in Stage 2 IndII will give operational support for the activation of the water supply Oversight Body; provide training on customer accounts and financial management; procure bulk water meters; conduct tariff analyses; and facilitate networking amongst LGs and PDAMs.

How Far Have We Come?

In February 2010, Government of Indonesia (GoI) stakeholders working with IndII selected 12 local governments from NTT and NTB. The IndII study team mobilised immediately and initiated discussions with the 12 selected LGs and their PDAMs. The main concerns of each stakeholder were assessed and itemised in a series of field visits and intensive discussions with individual stakeholders.

The activity culminated in a workshop in Kupang on 11 and 12 May, 2010 to discuss and agree on reciprocal actions to be taken by the stakeholders, supported by expert facilitators from the WASPOLA[2] project. After the workshop, LGs were given 10 days to submit their final proposals for

actions by all parties, including their requests for IndII support. Ten LGs submitted proposals and draft social contracts.

The IndII team made a quantitative and qualitative assessment of the proposals based on: how they responded to the present situation of the PDAM and LG; evidence of LG support for water services; and the relevance of the content of the proposal. In June 2010, IndII met with GoI Water and Sanitation Technical Team representatives and stakeholders to select LG proposals to implement in Stage 2. The original activity design anticipated proceeding with four LGs, but because of the unprecedented interest shown and the very close scores of the top five LGs, we agreed to implement five social contracts in Stage 2.

The second stage is about to start as this report goes to print. We hope to be able to report on the success of the activity in about nine months' time. •

NOTES

1. This is a simplification. The Ministry of Public Works (MPW) was directly involved in constructing water supply facilities during Repelita (five-year plans) I through IV (1969 to 1988). By Repelita V, the Ministry of Finance and Bappenas were pushing local governments (LGs) to take more responsibility for providing infrastructure and services. This led to the Integrated Infrastructure Development Programme (IUIDP), in which LGs and PDAMs were encouraged to borrow against foreign development loans to construct municipal infrastructure, including water supply facilities. MPW retained a central development budget for water supply during this period, and responsibility for water supply investment was divided. By 1995–96, the default rate on local government and PDAM loans under the IUIDP approached 50 percent. This was followed by the monetary crisis in 1997 and widespread default by LGs and PDAMs on loans.

2. The Water and Sanitation Policy and Action Planning programme, now operating as a facility with an emphasis on community-managed projects in water supply and environmental sanitation.

About the author:

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Access to Water by the Numbers

USD 10.3 billion
The investment needed from 2010 to 2015 to meet Indonesia's MDGs (Millennium Development Goals) for piped water coverage.

6.7%
The approximate annual growth in water use for domestic needs.

Rp 6.3 trillion
The total amount of loans (Rp 2.9 trillion) and interest and penalties (Rp 3.4 trillion) owed by Indonesia's municipal water companies in 2007.

Rp 3.61 trillion
The amount of debt write-off for municipal water companies stipulated in a decree by Indonesia's Minister of Finance in August 2008.

8
The number of Indonesia's municipal water companies that have more than 50,000 house connections. Another 77 companies have between 10,000 and 50,000 connections; the remaining companies (approximately 265) each serve fewer than 10,000 households.

30%
The proportion of Indonesia's municipal water companies operating without an accountant.

The Expert View

The Question: "The Government of Indonesia's strategies for increasing public investment in water supply include tariff reform, debt restructuring, a central government loan guarantee and interest-subsidy scheme, and output-based grants. Within this framework, where do you think the biggest challenges and/or opportunities lie?"

Ir. Danny Sutjiono
Director of Water Supply Development
Directorate General of Human Settlements
Ministry of Public Works

"Fundamentally, the four above-named strategies are all facets of one united approach in the effort to speed improvements in water services. All four are important and will have significant impact.

Above all, loan guarantees and interest subsidies face the biggest challenges, due to the mindset of insufficiently progressive PDAMs and local governments that only rely on internal funding capacity and government funds. These programs require that PDAMs have a reliable capability to manage debt and achieve healthy performance. At this time, only about 30 percent of PDAMs are healthy, and more than half are in arrears in their debt payments to the government.

On the other hand, these are the strategies that offer the greatest opportunities for improving public investment in PDAMs."

Dr. Ir. H. Syaiful, D.E.A.
Director PDAM Palembang
Head of PERPAMSI

"All of the government's strategies on approaching water investments are good and important. Each one has its own challenges and opportunities. Among the existing programmes, debt restructuring, the central Government's loan guarantee and interest subsidy scheme, and improving tariff-setting are, in my view, important methods for improving public investment, but there are many challenges as well.

Take the debt-restructuring programme, for example. The programme has been operational for two years, and only 15 local water companies have taken part in the process.

The process for loan guarantees and interest subsidies is complex, but even so local governments should support this process, by implementing steps to help their PDAMs achieve a healthy status. For example, selecting new directors who can bring new breakthroughs.

Heads of local governments are the ones with the authority to raise tariffs. If this is done in concert with service improvements, people's level of trust will be higher and they will accept tariff increases."

Road Development

January, 2011

KEY POINTS *on a Medium Term Expenditure Framework*

Indonesia has made considerable investment in roads over the past decades but it is not clear that it has received commensurate return. Plans this year to pilot a rolling multi-year budgeting process (Medium Term Expenditure Framework, or MTEF) and Performance-Based Budgeting (PBB) at the Directorate General of Highways (DGH) offer an opportunity to enhance budgetary effectiveness and efficiency.

The DGH strategic five-year plan for 2010–14 proposes expenditures of as much as Rp 30 trillion annually, nearly double the 2009 programme. Under the previous five-year plan, funding tripled but there was little increase in annual output – instead, the average costs of both preservation and development works rose steeply.

The current plan is focused almost entirely on the preservation and improvement of existing roads. Meanwhile, demand for road transport continues to grow rapidly. In order for Indonesia to improve its competitiveness and sustain economic growth, it urgently needs to enhance both trans-regional and metropolitan mobility. This requires the construction of high capacity road infrastructure.

DGH policy makers will need to examine, over a longer time horizon, the benefits versus the costs of road treatments (and whether these treatments are lasting as long as they should), widening, capacity expansion on trunk routes, and "worst first" approaches. Road preservation efforts must be conducted as efficiently as possible, and new expressways and trunk routes must be developed. To achieve these goals, DGH will need to conduct strategic planning; establish accountability at all levels; and use performance indicators to measure procurement quality, project implementation, and output.

DGH has already begun to adopt some changes in sector policy as it begins implementing MTEF-PBB. Much work remains, but the stage has been set for Indonesia to manage its road development in a manner that is both efficient and addresses future demand.

Improving Results in the Road Sector Through Budgeting Reform

The Directorate General of Highways seeks to maximise the return on its considerable investment in Indonesian roads. Planned reforms will help to achieve this goal.

William Paterson

Road users in Indonesia, faced with mounting traffic delays on city roads and long journey times or poor road conditions outside the cities, may wonder if the government is spending enough on roads and giving value for the money spent. A lack of infrastructure is cited as the second worst problem for doing business in Indonesia – after the problem of inefficient government bureaucracy – and the country ranks 94th out of 134 countries in the availability of road infrastructure, according to the Global Competitiveness Index in 2009. Moreover, it lags behind most of its Association of South East Asian Nations (ASEAN) neighbours in the availability of roads, on either an area or population basis.

How can this be, after a period of 40 years of five-year plans and reasonable funding devoted to roads, including spending nearly 20 percent of the government's total capital expenditure and over 3 percent of GDP on roads annually in the peak years in the 1980s? This is a question of whether the returns have been commensurate with the level of spending. Expenditures must be focused on the right projects in the right places, at competitive prices and with results that last.

The budgeting process is the government's tool for translating policy and political promises into action and results. Thus Indonesia's move this year to implement a rolling multi-year budgeting process

Planners often focus on road widening in hopes of relieving congestion such as that seen on this Bandung road.
Courtesy of IndII

(known as Medium Term Expenditure Framework or MTEF) and Performance-Based Budgeting (PBB) is an opportunity to enhance budgetary effectiveness and efficiency across government. As one of six agencies selected to pilot MTEF-PBB, the Directorate General of Highways (DGH) is at the forefront of this process.

The key ingredients to making a successful transition to MTEF include political commitment of both general ministries and sector ministries, keeping the process simple and uniform across sectors, and making it the sole basis for national resource allocation.

The AusAID-funded Indonesia Infrastructure Initiative (IndII) is assisting DGH to shape its introduction of MTEF-PBB and explore methods to improve and measure performance. A review team – supported by IndII and working under the auspices of DGH – discussed a wide range of issues with DGH senior management, reviewed past performance, looked at needs and options for the future, and prepared a study that gives guidance on how the MTEF-PBB can be integrated into DGH during 2011–13. Some of the study's key findings are presented in this article.

The Current Landscape

During the five-year strategic plan (Renstra) for 2005–09, DGH managed the addition of 8300 km to the national road network by reclassification and improvement of substandard roads – a 32 percent increase in primary road network length. Further, road capacity (defined by the lane-kilometers of road space) increased by about 13 percent. Overall road conditions during the five-year period were kept at the same apparently high level of 88 percent stable (good and fair) condition and 85 percent paved. However, reports from citizens and politicians, and DGH's own demands for more funding, suggest that these statistics may not reflect the real conditions.

What will happen next? DGH has set out a number of policy goals in its medium and long term planning. These include: correcting the disparity in road density between the populated regions of the west and the remote regions of the east and north; improving the poor condition of the local road network; finding an optimal maintenance strategy; and strengthening weak controls over truck overloading.

The DGH strategic five-year plan for 2010–14 proposes a significant increase in both funding and outputs. In the formally approved version, the budget was increased to as much as Rp 30 trillion annually, with an output averaging 8660 km of major works output (for building, rebuilding and

The Benefits of MTEF and PBB

A Medium Term Expenditure Framework (MTEF) establishes a rolling budget over a three-year period, making it possible to adapt funding levels based on a changing fiscal environment and/or emerging priorities. Use of an MTEF is intended to heighten accountability for performance and help to ensure that policy goals are achieved. MTEF can improve the predictability and continuity of funding, especially for multi-year capital expenditures. It can also sharpen the debate over the effectiveness of current policies and the potential benefits of policy changes.

Under Performance-Based Budgeting (PBB), budget allocations for individual departments or work units are established with reference to the projected accomplishments of the division in question. This is in contrast to more traditional forms of budgeting that base the next year's allocations largely on the amount spent in the previous year. PBB specifies an unambiguous linkage between activities and specific organisational units, giving managers clearcut responsibility and control. It creates a formal connection between the goals of the long term or medium term plans and the funding resources required to achieve them.

Prakarsa Compendium

resurfacing roads) each year. These numbers are nearly double the 2009 programme.

Such figures hold great promise for Indonesia's road development, if funds are spent in the most efficient and effective manner. But there is no guarantee that this will happen automatically. Under the previous five-year plan, funding tripled but there was little increase in annual output – instead, the average costs of both preservation and development works rose steeply. These cost increases may in part be due to higher standards of treatment. But they strongly suggest that a focus on improving performance will enable DGH to achieve greater value for its expenditures in the future.

The current plan expands both the programmes for the preservation of existing assets (rebuilding and resurfacing) and for development of the network (mainly widening of trunk routes, building strategic roads in remote areas and bridges). However, the plan may be ambitious because at current prices it is equivalent to covering every road in the existing network within four and a half years, or 110 percent of the network in five years, and doubling the output capacity of the road construction industry. A significant portion of the funding (about 55 percent) is allocated to road and bridge development, but most of that is for road widening.

Meanwhile, *demand for road transport is growing rapidly and it will continue to do so.* In order for Indonesia to improve its competitiveness and sustain economic growth, it urgently needs to enhance both trans-regional and metropolitan mobility. This requires the development of high capacity road infrastructure.

Issues to Address

How can Indonesia fund the development of the new road infrastructure it will need, if funding is focused on existing roads? The study identified a number of issues to consider:

• Road treatments as they are currently being done appear to have a shorter life and to be heavier than expected compared to the amount of road covered annually and the relatively static condition of the network. These suggest there is room for improving the present design policy, by shifting the focus from short term to longer term and thereby improving the performance of roads and reducing their annual cost. There is also a need to improve the management of quality in both design and construction so that the expected life of the assets is better achieved.

• In the new five-year plan the government is adding a further 4000 km of strategic roads to the national network in remote areas. These are generally low-standard roads with poor geometry and weak structures, but are an important element of regional and social development policy. DGH has tended to adopt quick incremental improvements to such roads, focused mainly on widening the carriageway, but without long term improvements to the alignment and strength of the road. The incremental approach is costly and inefficient because it imposes high future demands for additional spending, and a longer term approach including renewal of the road to appropriate standards to serve local conditions for over 20 years would yield lower annualised costs.

• The policy of providing major capacity expansion on trunk routes may not be the best use of funds over the long term. Making trunk routes into four-

Road conditions vary dramatically throughout Indonesia, with remote roads often in the worst condition. *Courtesy of Tyrone Toole*

lane divided roads relieves immediate congestion, but the lack of attention to how adjacent property is used and what access is available to that property means that much of the increase in capacity is not realised and the approach does not sufficiently enhance mobility over a longer time frame. A separate integral expressway network is required. Planning and implementation for this future need is inadequate under the current toll road programme. The policy on major infrastructure development needs to extend to a longer 50-year horizon so that adequate resources are allocated to accelerate the expressway development to meet the demand projected by economic forecasts.

Taken together, these concerns suggest a pattern of current decision-making that may produce cost savings over the short term, but is less beneficial and more costly over a longer time horizon. When a "worst first" or quick fix approach is taken, an unfortunate cycle can develop: roads that need extensive work are funded first, or widening is done to provide quick relief that will not be adequate for future demands. These projects are expensive, and leave insufficient funds to maintain roads at the right time, much less focus on new road development. As a consequence, existing roads eventually deteriorate to the point where major work is needed, and congestion builds up again.

This cycle ultimately places a heavier burden on government coffers than would be the case if high quality, long-lasting maintenance had been done on roads before they deteriorated, and resources had been devoted to the development of new roads.

Focus on Core Business Areas

To break out of this cycle, the study recommends that the priority for any budget over Rp 20 trillion/year be the development of new expressways and trunk routes. Further, the efficiency and effectiveness of road preservation efforts should be improved. The MTEF-PBB structure which is recommended for the DGH programme focuses on three core business areas and should enable DGH to achieve the goals below:

1. Improve major (trans-regional) road infrastructure to support competitiveness of regional and internal trade and production.

2. Improve the quality and capacity of national arterial road networks to connect remote and central regions.

3. Improve the performance and accountability of central and local road agencies in providing sustainable and cost-effective local road infrastructure.

These goals can be translated into specific strategies for DGH to undertake. The specifics spelled out in the study include the following steps:

Enhance trans-regional and metropolitan travel performance: This will require strategic planning, stronger prioritisation, and increased mobilisation of financial resources, as well as a vigorous concentration on accelerating the expressway programme.

Enhance value for money by adopting a "whole life cost" approach: Under this approach, the pavement design life and costs for construction, periodic maintenance and rehabilitation would be optimised over the expected lifetime of the road to incur the least average annual cost to the government and the road users.

Enhance value for money by improving asset quality and performance: Such improvements can reduce the long term average costs of funding the network. Specific tools, such as analysing actual life to determine past performance, can be used to monitor and improve quality and performance.

Enhance the efficiency of project delivery: The efficiency of project delivery can be improved by holding managers accountable through reporting performance indicators of cost, time and other factors throughout the project cycle. Measures of cost parameters include contract price and variance; measures of time include how long it takes for preparation, procurement and evaluation, and so on.

Enhance procurement quality: Overall quality of procurement in terms of competition and efficiency can be improved by instituting performance indicators such as contract package size; total number of contract packages; total value of contract packages; and others.

Monitor output costs: Benchmarks can be established to measure the reasonableness of the overall costs being achieved.

Enhance organisational effectiveness: A performance reform review is needed in two key areas of the decentralised DGH organisational structure. Improvements could be achieved, in terms of accountability for effectiveness and efficiency, by examining: (1) responsibility for managing the value-for-money issues (which is shared among the central engineering policy directorate, sub-provincial work units, and project officers at the project level); and (2) responsibility for procurement quality and efficiency (which is spread over hundreds of project officers with either little or unclear accountability).

Next Steps

DGH has already begun to adopt some changes in sector policy based on the findings of its initial review. It is clear that much additional work will be needed to maximise the effectiveness of the MTEF-PBB, but the stage has been set for creating a framework within which Indonesia can derive more benefit and better performance from its spending to develop and maintain its roads. •

About the author:
William Paterson is an independent consultant on transport infrastructure and institutional issues, especially relating to governance. He has been working on the IndII programme since mid-2009 and on the international construction sector transparency initiative since 2008. Formerly he was a Lead Infrastructure Specialist in the World Bank, responsible for advising transport sector investment programmes in Vietnam for two years, and earlier in developing countries in Asia, Africa, Latin America and Eastern Europe over a period of 27 years. He has special experience in the development and management of transport infrastructure systems, especially for the road sector, in governance and anti-corruption capacity in the transport sector, in institutional reform and capacity building, infrastructure management systems, and in disaster risk management.

KEY POINTS *on PBCs for Highway Maintenance*

In a traditional contract, contractors are paid for the amount of work being completed. Under a Performance-Based Contract (PBC), the contractor works on a lump sum basis, usually receiving annual payments subject to meeting contractually binding performance requirements. International experience shows that PBCs can deliver higher quality results for the same price, or the same quality results for a lower price. Under PBCs, contractors are forced to adopt optimal maintenance strategies. This may be of particular benefit in Indonesia, where resources have historically been concentrated on roads in the worst condition, instead of maintaining roads to prevent the need for extensive rehabilitation.

The Technical Directorate of the Directorate General of Highways (DGH), Bintek, is currently undertaking two pilot PBC projects on 30 kilometres of National Highway. Support is being provided by the AusAID-funded Indonesia Infrastructure Initiative (IndII). This support includes a review of tender documentation and assistance in finalising the bidding documents. The review found that the Bintek documents and processes were generally of a very high standard. Recommendations were made regarding risk mitigation and sharing. In particular, a "sustainability hurdle" should be established so that tenders offering an unsustainably low price are disqualified. The assumption of some risks should be transferred to the contractor. Further, a governance board should be established to rule on any decisions that cannot be dealt with by the contractor's project manager and the DGH Superintendent. IndII is providing continuing support to allow DGH to implement the initial pilot PBC projects in an effective manner.

Performance-Based Contracts for Managing Indonesia's Highway Maintenance

The Directorate General of Highways is well on its way to implementing performance-based contracting for the management of highway maintenance. The benefits they can realise will be substantial.

Theuns Henning
Garry Miller

The Technical Directorate of the Directorate General of Highways (DGH), Bintek, is currently undertaking two pilot Performance-Based Contracts (PBCs) projects on 30 kilometres of National Highway under their current (2010) national budget (APBN). This article outlines the approach adopted in embarking on these pilot projects, describes the benefits of PBCs, discusses the findings of a field trip undertaken as part of implementation, and describes aspects of how knowledge is being transferred to Indonesia from the New Zealand experience with PBCs.

Understanding PBCs and their Benefits

Originally introduced to DGH during 2006, PBCs promise a number of benefits for Indonesia. At present, local governments tend to give the highest priority to reconstruction/rehabilitation of roads, adopting a "worst first" approach rather than trying to avoid the need for extensive works through ongoing maintenance (see "Improving Results in the Road Sector Through Budgeting Reform" on page 141 for further discussion of this issue). PBCs tend to shift the focus toward maintenance, because they make it possible to

A cross-section along the Ciasem-Pamanukan section of the National Highway where a drain is being replaced. This project is part of a performance-based contract being operated on a pilot basis.
Courtesy of Theuns Henning

secure long term funding for the maintenance of a particular network, and they establish an understanding that the asset will be maintained at a pre-determined level of service.

As a result, contractors are forced to adopt proper asset management planning processes that will result in optimal maintenance options being chosen. Likewise, this encourages enhanced design and construction quality. For example, the PBC format encourages the use of preventive maintenance such as resurfacing and drainage maintenance to restrain rapid deterioration. On the other hand, when rehabilitation projects are undertaken, they will be completed to a standard that ensures long term performance and prevents additional cost on the road section within the contract term. (In most cases, PBC contractors cannot afford to do maintenance more than once on a given road section managed under a PBC.)

Whereas traditional maintenance contracts use a unit rate principle (i.e. the contractor is paid for the amount of work being completed), PBCs work on a lump sum basis. Typically, under PBCs the maintenance contractor is paid an agreed annual payment, which is subject to meeting contractually binding performance requirements, with incentives and disincentives for exceeding or failing to achieve performance targets. Performance-based contracting is based on the long term performance of the road, thus incentivising quality work from the contractor. By ensuring high quality in the work, the contractor saves money by not having to return to the same part of the road on a frequent basis, which is often a characteristic of traditional contracts where quality assurance is more problematic.

There are a number of benefits that agencies from around the world have identified from PBCs.

There are significant risks in adopting the lowest price conforming bid as a basis for awarding contracts under performance-based contracting.

International agencies have reported tangible benefits in terms of delivering either cost savings whilst maintaining current levels of service, or delivering significant improvements in road condition whilst maintaining constant levels of expenditure for areas where that was an objective set for the PBC.

National agencies that targeted efficiencies with the PBCs rather than road condition improvements have demonstrated cost savings ranging from 15 percent to as high as 30 percent (Hyman, 2009). Hence, benefits over cost are typically greater for PBCs compared to traditional contracts, and as such it can be argued that PBCs deliver better value for money.

Indonesia's First PBC Documents

Consultants from the AusAID-funded Indonesia Infrastructure Initiative (IndII) are currently providing support to DGH as it implements the first two PBCs in Indonesia. Support provided to date has included a full review of existing tender documentation and specifications, field verification of the two identified pilot areas, and assistance to finalise the bidding documents for the two pilot projects. These documents are primarily based on templates and documents available from the World Bank. Experience from New Zealand, Australia and other developed countries is also being utilised to help ensure that the pilot PBCs in Indonesia are successful, with the transfer of knowledge to DGH counterpart staff being a major objective.

The procurement process for both the PBCs includes a two-stage tendering process. The first stage, which was recently completed, is a short-listing of candidates based on Expressions of Interest from qualified contractors. Stage two, which will culminate in a final tendering of the works, will consist of a review of both the technical and financial proposals, with special emphasis on the technical approach and overall value for money for Indonesia.

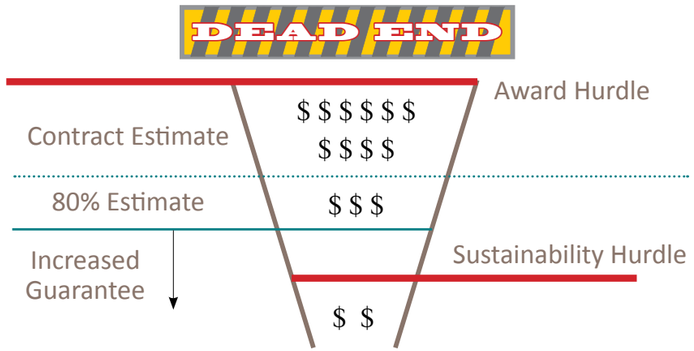


Figure 1: Price Ranges of Acceptable PBC Tenders

Tenders that are more than a specified amount above or below the internally determined contract estimate are disqualified. Tenders less than 80 percent of the contract estimate but above the sustainability hurdle may require increased guarantees.

IndII's review of existing tender documentation and specifications found that the Bintek documents and processes were generally of a very high standard. Some recommendations for enhancement were made, but these were generally from a perspective of newer developments in the PBCs' best practice. The main recommendations are summarised in the following sections.

Managing Risk Using PBCs

PBCs offer a range of options for agencies to manage risk through the contract. There are two main considerations for risk management during the initial stages of implementing PBCs, namely:

1. Mitigating the risk of contract failure through the tender specification, assessment and selection process.

2. Determining the most appropriate arrangements for risk sharing under a PBC in Indonesia for the long term contract.

Risk Mitigation Through Tender Specification – The success of a maintenance contract is heavily dependent upon the selection of a tenderer who is capable of completing the scope of the work, to the required quality standards, at the tendered price. Hence the tender documents, the specifications and the tender evaluation process become the means of mitigating the risk of awarding an unsustainable contract. Some additional recommended mechanisms of ensuring the appropriate selection of tenders are *price assessment, underpinned quantities,* and *incentive and penalty clauses.*

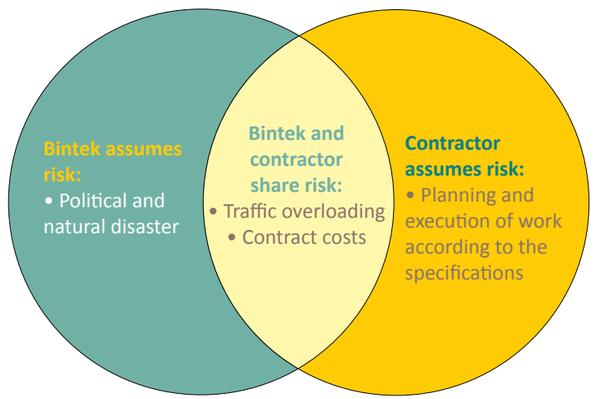
Price assessment – There are significant risks in adopting the lowest price conforming bid as a basis for awarding contracts under PBCs. Given the longer-term concept of PBCs, low prices are typically unsustainable and are often received from contractors who do not have the ability to undertake contracts of a large scale and nature. This risk was recognised in the original contract documents and initially was addressed by the introduction of increased guarantees from very low tenders. However, it was identified that such an arrangement was unlikely to be effective in addressing this risk and a new structure was proposed as illustrated in Figure 1. Tenders falling below the internally established "sustainability hurdle" should be disqualified.

Underpinned quantities – It was recommended that DGH use minimum quantities of work for the PBC pilots. Although the contractor is expected to identify what maintenance inputs are required to achieve the performance requirements, the agency needs to have assurance that the contractor will apply sufficient rehabilitation and important selected improvement works that will outlast the contract term.

Incentive and penalty clauses – The original contract documents included appropriate penalty and contract termination clauses. However, it was recommended that incentive clauses for good outcomes be included also.

Determining Risk-Sharing Arrangements – One of the most attractive aspects of PBCs for agencies is that many traditional contract risk items are transferred to the contractor. The basis of a PBC is that the contractor must ensure the network performs to the given specification in return for the agreed lump sum consideration. Therefore, the risks related to the performance of the network and the risks related to the cost of maintaining the work are both transferred to the contractor. However, it is not cost-effective to transfer all the contract risks to the contractor, as some of these risks – such as political and funding risk – fall outside of the contractor's control. In addition, some risks may be costly to transfer to the contractor. Although contractors are willing to accept some risks, they will adopt an "insurance" premium on their tender price should they feel they are required to assume too much of some risks, such as traffic overloading of roads. Experience has indicated that risks are best managed by the party who has the most influence on the particular risk. The recommended risk-sharing approach for the Indonesia PBC is graphically indicated in Figure 2. It shows that the government will assume most political and natural disaster risks, while the contractor takes all the risks related to planning and execution of work according to the specifications. Both parties share some elements of risk related to traffic overloading and costs related to the contract.

Figure 2: Recommended Risk Sharing Arrangement for Indonesia's PBCs



Performance-based contracts encourage projects to be completed at a standard that will minimise the need for repeated maintenance. *Courtesy of Theuns Henning*

Governance of PBCs

An important feature of PBCs is the explicit consideration of the governance structure of these contracts. Given their simple contractual arrangements, fewer resources are required to manage and monitor PBCs. For example, where traditional contracts required consultants and contractors in two separate contracts, a PBC only establishes a relationship between the agency and one contracting party (normally the contractor). For planning design and quality control aspects, the contractor would employ their own consultant as a subcontractor or employ relevant staff with the appropriate skill levels. The PBC contractual arrangements result in a communication process that is more effective and allows decisions to be made faster. Therefore, one of the recommendations made included the establishment of a governance board that is responsible for any decisions that cannot be dealt with by the contractor's project manager and the client DGH Superintendent.

A Continuing Process

DGH has made significant progress with the tender document and processes. The tender document fulfils most of the criteria specified in standard PBC template documents, such as those released by the World Bank. However, the IndII review so far has highlighted a number of practical recommendations that should enhance the value and the effectiveness of the PBC trials and at the same time be instrumental in receiving realistic tender prices.

During the review, the consultant worked closely with DGH and this provided opportunities that resulted in recommendations being discussed and tested on the basis of Indonesian legislative and normal procedures. In addition, immediate knowledge transfer took place as the consultant was working alongside Bintek staff on the review.

IndII is continuing to provide support to allow DGH to implement the initial pilot PBC projects in an effective manner. Ideally, an official and robust monitoring and improvement cycle will be put in place to ensure the success of the pilots and beyond. •

REFERENCES

Hyman, W.A. (2009) Performance-Based Contracting for Maintenance. A Synthesis of Highway Practice. *NCHRP Synthesis 389. Transportation Research Board. Washington D.C.*

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Improving Maintenance Management and Planning for Provincial and Kabupaten Roads

Many of Indonesia's regional and local road networks are in poor condition. The Directorate General of Highways is leading the way to support local agencies to find the best strategies for lasting improvements.

Tyrone Toole
Harris Batubara

KEY POINTS *on Maintaining Regional and Local Roads*

Many of Indonesia's regional and local road networks are in poor condition. The Directorate General of Highways (DGH) has responsibility to provide leadership and technical support to local agencies to address this. DGH is undertaking a two-phase project that is receiving assistance from the AusAID-funded Indonesia Infrastructure Initiative. The recently completed Phase 1 studied current road maintenance practices, needs, and funding at five provincial and eight kabupaten road agencies from Java, Bali, Nusa Tenggara and Sulawesi. Phase 2 will develop and demonstrate a systematic and sustainable approach to planning, programming and budgeting (PPB) road maintenance activities that can be replicated throughout the archipelago.

Managing road infrastructure across diverse settings is challenging: the agencies studied vary greatly in the types and conditions of their roads, as well as in their economic capacity to sustain an adequate network. Phase 1 recommendations include: focusing on preservation with existing funds; seeking additional funds for renewal; developing standards that will enable optimal allocation of scarce resources; and socialising asset preservation.

In Phase 2, DGH will pilot the PPB policies and procedures it is developing and test them under a range of conditions, helping local officials to understand newly introduced tools and technology and the benefits of asset preservation.

Rural roads are vital to the economic health of communities. They make it possible to transport goods and they provide access to employment, goods and services, and markets. Efficient and reliable roads can have a significant positive impact on socioeconomic well-being.

In many parts of Indonesia, regional and local road networks are in poor condition. Consequently, the Directorate General of Highways (DGH) has been given nationwide responsibility, in the 2010–2014 Strategic Plan, to provide leadership and support to local road agencies as they improve their management of regional roads.

To carry out this mission, DGH has undertaken a two-phase project that is receiving support from the AusAID-funded Indonesia Infrastructure Initiative (IndII). The primary aim of the first phase, which was recently completed, was to study current road maintenance practices, needs, and funding at the sub-national level. The second phase will develop and demonstrate a systematic and sustainable approach to planning, programming and budgeting (PPB) road maintenance activities in selected provinces and kabupaten, creating a model that can be adopted throughout Indonesia. The Sub-national Road Facilitation Unit is taking charge of the effort within DGH and is supplying direct support to local level agencies.

The Phase 1 study has drawn on extensive consultation with representatives from five provincial road agencies and eight kabupaten road agencies from West Java, Central Java, Bali, Nusa Tenggara Barat and West Sulawesi. These agencies were

selected to ensure that both east and west Indonesia were represented. Other information sources included senior personnel at DGH, AusAID and IndII, and specialists in the field; historical and current data on road conditions and funding; and a review of national and international practices.

Diverse Needs and Resources

The characteristics of the agencies studied vary greatly, illustrating the challenges inherent in managing road infrastructure quality and sustainability across a diverse range of settings. For example:

- The extent to which roads are sealed varies significantly from agency to agency, ranging from 25 to 100 percent. In the eastern provinces, unpaved earth roads also account for a significant portion of roads.
- Each agency had anywhere from 25 to 95 percent stable road conditions. ("Stable" roads are those determined to be in good or fair condition.)
- The ratios of road asset value to Gross Regional Domestic Product for the five review provinces suggest that capacity to support a sustainable and sufficient network varies considerably. Among the five, two had an insufficient economic base, one was borderline, and two had sufficient capacity.

The Phase 1 study examined four areas: needs, practices, and capabilities; delivery of routine maintenance; procedures and tools; and the legal and regulatory framework, procurement and support. Amongst its most significant findings and recommendations are:

1. Essential routine and periodic maintenance to help preserve existing road networks should be given the highest priority. Budget constraints exist across most agencies, and the estimated funding needed for this maintenance is approximately 75 percent of the total road sector budget. Consequently, additional funds should be sought to help fund renewal of the networks.

2. The amount of funding needed to complete essential maintenance and clear out the backlog of major renewal works is three to five times current total funding. Needs vary by agency type and location, with those of kabupaten agencies and eastern Indonesia being the greatest. The key to deciding where scarce resources should be allocated lies in setting minimum standards for road access and establishing priorities related to the amount of travel demand. With these standards and priorities in place, DGH and local agencies can focus on developing a core strategic network.

3. Decision makers and technical staff should be helped to better understand the benefits of asset preservation. They should also be given the tools they need to optimise decisions about allocating funds. Too often decisions are taken without a rigorous technical basis, leading to a cycle of building/renewal and failure. Changing this behaviour will require a different approach to funding and contracting services. A "carrot-and-stick" approach is being considered in which roads will be selected for grant funding under multi-year extended warranties or similar types of contracts, with the requirement that the regional road agency receiving the grant fulfils obligations to maintain other parts of the network at a sustainable level. Achieving the desired results will require strong leadership underpinned by appropriate regulations, policy, consistent guidelines and procedures, and appropriate funding instruments and delivery arrangements.

4. DGH is developing proposals for conducting practical demonstrations of how a future system might work. These demonstrations will include preparation of a draft policy, guidelines, trial works programmes and funding support.

Many rural roads, like this one in West Sulawesi, are in need of improvement. *Courtesy of IndII*

Key issues and actions have also been identified which emphasise the need for a strong policy-driven environment; a commitment to clearly defined maintenance standards and their successful delivery; supportive planning procedures, tools and cost-effective solutions; and building capacity in outcome-based delivery.

The Legislative Framework

Recent legislative changes also provide a stronger basis to support sustainable improvements in the management of sub-national roads, including:

- Law no. 22/2009 on Road Traffic and Land Transportation, which clarifies the roles of national agencies in setting norms, standards and guidelines; responsibilities for managing the safe use of public infrastructure; and roles of sub-national agencies. Most importantly, it provides for the formation of a Road Preservation Fund Unit, with the task of leading the preparation of a Presidential Decree and the technical basis on the setting up of the unit, in collaboration with key ministries. This is now at an advanced stage, and will establish a legislative basis for better management of funds, collection and administration of road user charges, and involvement of road user representatives in the management of roads.
- Law no. 28/2009 on sub-national taxes and charges, which sets out new arrangements on vehicle taxes with minimum allocations

stipulated for road construction and maintenance, and public transport.

In general terms, the results from the Phase 1 review have been very effective in addressing the issues of agencies that manage road networks under a wide range of conditions, capabilities and experiences. The range of physical, financial, workforce capability and management environments across these agencies provides a rich range of choices from which to prepare plans for future technical assistance.

Future Challenges

In the next phase, DGH will have an opportunity to pilot the PPB policies and procedures it is developing and test them under a range of conditions. Much of the work will involve assisting provincial and kabupaten agencies to use the right tools for planning, budgeting, and contracting. Further, it will be important to find the correct technological solutions for low-volume rural transport infrastructure, encompassing a full range of surface types from earth to asphalt, and keeping in mind that a "blacktop" solution may not be the best answer in all circumstances.

Perhaps the most significant challenge will be in training and socialising. DGH will need to help local officials understand how newly introduced tools and technology, combined with a focus on asset preservation, lead to benefits for all road users over the longer term.

This process of changing mindsets will require awareness raising and training. When it is successful, agencies will be well-prepared to take advantage of output-based grants that reward agencies that maintain their networks at a sustainable level. •

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Author's Update

From the work undertaken, it is clear that road maintenance at the sub-national level in Indonesia is significantly under-resourced. Conditions have noticeably deteriorated since decentralisation, and the ability of agencies to objectively identify road maintenance needs, plan and then programme the works is limited. In addition, routine and periodic maintenance has received little support even with the limited funds available because of a lack of political visibility.

AusAID is potentially interested in providing grant support to improve sub-national road maintenance; however, the form that this support might take is not yet clear. As described elsewhere in this volume, the output-based "Water Hibah" programme has been supporting improvements to water supply by providing grants to local governments that are paid based on successful completion of water connections. A similar system could be developed in the road maintenance sector.

The second phase of IndII's efforts to determine the feasibility of a sub-national road maintenance grant programme has commenced and is scheduled for completion in June 2011. The team is initially working together with the provincial government and selected local governments in Nusa Tenggara Barat (NTB) to develop and pilot road maintenance planning processes and procedures. At the same time the potential for developing a Hibah grant programme for road maintenance in sub-national governments is being investigated. The target is to develop a wider implementation programme in the extension of IndII (2011-2014) which could potentially promote and incentivise improvements in road preservation through grant funding for road maintenance through a Hibah system.

The design of Phase 2 involves assessment of conditions in two kabupaten and piloting the use of PPB procedures for provincial roads. The aim is to cover a range of network conditions, including both sealed and unsealed roads. Consequently, the pilot is providing an opportunity to fully test most aspects of a proposed draft maintenance policy and procedures under a wide range of operational conditions, including road access and mobility constraints.

Phase 2 has made good progress, with the following notable achievements:

- Confirmation of support by DGH, the provincial and kabupaten public works departments, Bappeda and kabupaten agencies for the project.
- Assessment of actual field conditions in NTB following a drive-over of roads in West Lombok and Central Lombok.
- Production and trial of field survey procedures, and application of these procedures in surveys of approximately 2,500 km of road and associated bridges. This will provide a comprehensive, high quality data base which will be available for provincial and kabupaten authorities, and which will be used in this project to develop a set of multiyear works programmes for provincial roads and bridges in NTB, with these forming part of an overall coordinated plan for the province. The outputs will be used as a basis for discussions with stakeholders on the impact of alternative funding levels and their relation with outcomes, and the socialisation of the benefits of asset preservation and maintenance.
- Progress on project activities, including discussions related to possible alternative funding mechanisms such as a "sub-national roads Hibah". ■

Making the Most of a Road Management System

The Indonesian Integrated Road Management System is equipped with many features suitable for use at the Directorate General of Highways, but its capabilities have never been fully exploited. New recommendations point the way toward an improved Road Management System that decision makers can use to allocate resources more efficiently.

Jens Chr. Helbech Hede

The Directorate General of Highways (DGH) has for many years maintained a Road Management System (RMS), the Indonesian Integrated Road Management System (IIRMS), though with only partial success. The system is operational and contains substantial data. However, data quality problems have been reported and the system output is not effectively used for planning and programming. Further, the IIRMS has reached a technical crossroad where it is necessary to ask if further development of the IIRMS should be undertaken or whether it should be replaced by another system.

To answer this question, DGH initiated a review of the current IIRMS, including a situational analysis, appraisal of strategic options, and recommended approaches. The AusAID-funded Indonesia Infrastructure Initiative provided technical assistance to the review. This article offers an overview of the role played by Road Management Systems and what factors are key to their success, the situation with respect to Indonesia's current RMS, and the recommendations made by the review team.

KEY POINTS *on Using a Road Management System*

The Directorate General of Highways (DGH) has been operating a customised Indonesian Integrated Road Management System (IIRMS) since the early 1990s, but with only partial success. Ideally, a Road Management System (RMS) supports active management and economically efficient decision-making on road rehabilitation and maintenance. DGH, which initiated a review of the IIRMS with technical assistance from the AusAID-funded Indonesia Infrastructure Initiative, now stands at a crossroad, ready to implement several key recommendations that can improve the way in which it uses an RMS.

The review revealed that most problems with the IIRMS relate not to inadequacies of the software itself, but rather to the failed institutionalisation of the IIRMS. The main concerns are poor data collection, the lack of proper business processes, weak system operation and inadequate staff capacity. DGH must now determine how to move forward on three key fronts: whether to use a bespoke (customised) system or a commercial-off-the-shelf (COTS) system; whether to operate the RMS internally or outsource operation; and whether to collect data in-house or outsource the collection. These are questions with no easy answers, but recommendations come down in favour of using a COTS and outsourcing data collection. Accompanying recommendations that should lead to a sustainably institutionalised RMS include significant and continuing staff training and clear delineation of business processes, including tasks, timelines, responsibilities and linkages.

DGH has begun a review and approval process for these recommendations, and hopefully the steps taken will help DGH to maximise its use of resources as it maintains and develops sound networks throughout Indonesia.

The IIRMS database keeps track of road characteristics such as inventories, surface condition and roughness, and traffic levels. *Courtesy of Theuns Henning*

The Role of Road Management Systems

Road agencies must often balance competing objectives: maintaining and developing road and bridge networks, staying within severe budget constraints, satisfying political objectives, and meeting demand by road users.

In most countries, road networks span several thousand kilometres and encompass thousands of bridges, all with their own characteristics, usage and conditions. Without technological tools it is impossible for any road asset manager to monitor this network efficiently. Such tools allow agencies to maintain a comprehensive database on the characteristics of assets, enabling active management of the road network. Hence, most road agencies have implemented RMS.

Success Factors

Implementing an RMS is no easy task, and many efforts have failed. In 2005, the World *Bank*[1] conducted a study to identify key success factors. The study gauged the experience of 21 different road agencies in 16 different countries. The main conclusions are illustrated in Figure 1.

The three main and interrelated success factors are people, processes, and technology, which must be supported by adequate funding. *People* refers mainly to those involved in the development, implementation and operation of the RMS, but also to those who use the output in their decision-making. If there is not outspoken and explicit commitment to the RMS at all managerial levels of the road agency, the system will never be effective. Further, the appropriate people must understand how to manage, maintain, calibrate and operate the RMS, and understand the system input and output.

Process refers both to data collection and use of output in the agencies' business processes. If relevant data is not accurately collected, any resulting analyses will fail or provide useless output. Further, the output must be effectively used in organisational decision-making.

Finally, the *technology* underlying the RMS must suit agency needs. If the modelling capabilities are inadequate or the user interface is too complex, it will not benefit the road agency.

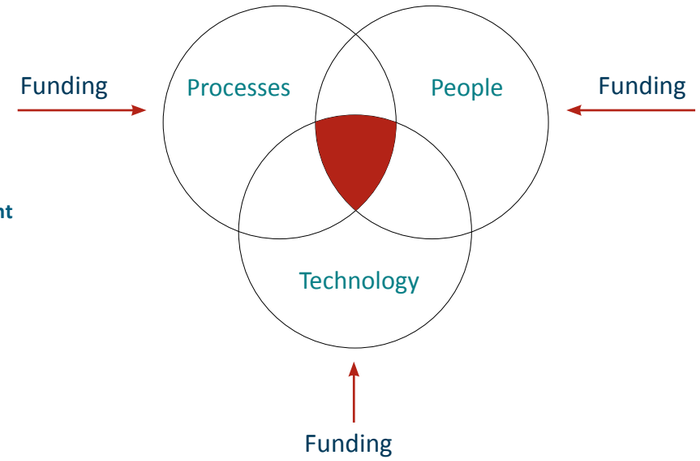

Figure 1: Key Success Factors for Implementing a Road Management System

The IIRMS

Indonesia has implemented some form of computerised IIRMS since the early 1990s. The last major system upgrade occurred in 2006, and since then the IIRMS has operated in a full Windows version.

The IIRMS database keeps track of road characteristics such as inventories, surface condition and roughness, and traffic levels. The system is also capable of recording data on bearing capacity, works history and ongoing works, but these features are not currently in use.

The IIRMS comprises a number of modules, only some of which are used. The two primary modules that are used to analyse data are the programming module and the strategic expenditure planning module. The programming module identifies maintenance needs and the optimal strategy for meeting these needs within specified budget constraints. It produces a list of proposed works for specified road sections, laying out timing and costs over a horizon of three to five years.

The strategic expenditure planning module analyses the entire network over a longer time frame, typically 10 years. It projects future road network performance in terms of characteristics such as road condition, using different assumptions for budget levels and types of maintenance work conducted over the period. This output is useful when determining budget allocations and allocations among different classes of roads and types of works. Both the programming and strategic expenditure planning module compare road agency costs to road user costs.

Other potentially valuable modules in the IIRMS are not used by DGH, such as the statistical analysis module, which provides a range of road network statistics, and the executive highway information module, which is intended to provide data for senior management who do not need information at the same level of detail as technical staff. This module also contains an imbedded Geographical Information System (GIS), which has the capability to show data on maps (see Figure 2).

The IIRMS also includes interfaces with other systems in DGH (such as Construction Monitoring, the Bridge Management System, the asset management model HDM4, and Google Earth), but these features are used either not at all or only very rarely.

The features of the IIRMS are in line with what is generally expected of RMS software, either from a commercial package or bespoke (custom-made) system. Overall, its modelling capacity is suited to DGH, although the models could use some calibration to move from an emphasis on rehabilitation to more economically viable preventive maintenance. But the models are hard-coded into the IIRMS and cannot be changed except through system reprogramming.

Key Issues

The review of the IIRMS highlighted the extent to which it is only sporadically used by staff. The latest version (version 2.1) has never been adopted; DGH is still using version 1.9. Moreover, the methods DGH uses to apply IIRMS output to decision-making are out of date. For these reasons, reviewers quickly zeroed in on the fact that many problems with the IIRMS relate not to inadequacies of the software itself, but rather to the failed institutionalisation of the IIRMS.

The four key areas of concern highlighted by reviewers were data collection, business processes, system operation and management, and staff capacity.

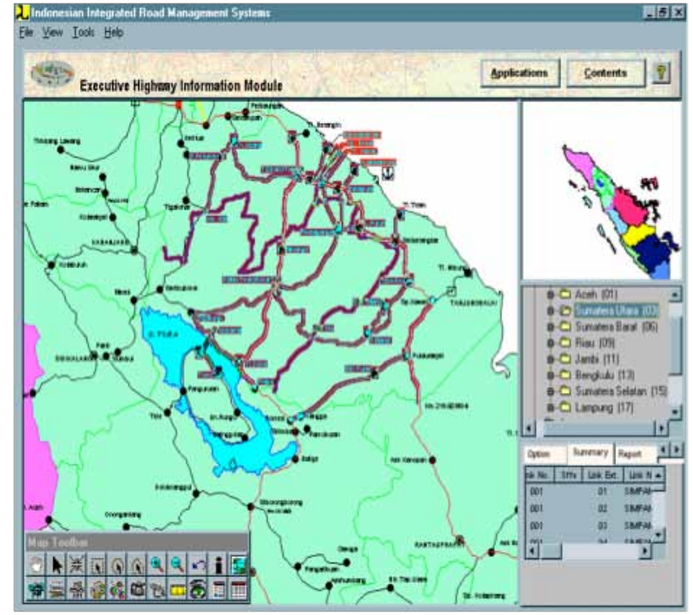

Figure 2: Example of GIS Data Mapping Function

Data collection: Many stakeholders reported problems with data quality. Data collection is decentralised, managed individually within each province. Some data that is essential to creating sound models is not being collected, and other data is collected unnecessarily. Quality assurance is virtually nonexistent.

Business processes: DGH has no guidelines for how the IIRMS should be used to improve decision-making. Responsibility for managing the process is not clearly assigned and much IIRMS output is not utilised.

System operation: The review revealed that staff within DGH do not have the capacity to operate the system effectively. When operators lack understanding of technical issues related to modelling, the quality of the output is adversely affected. For example, the IIRMS is used without first reviewing the control parameters, so models may rely on assumptions that are several years out of date.

Staff capacity: Very few staff at the central level are actually involved in IIRMS data collection and operation. To institutionalise an RMS, personnel who are knowledgeable in a range of specialties are needed: these include systems analysis, data collection, system management and others.

Options and Recommendations

DGH has several options to consider as it develops a strategy for sustainably institutionalising a RMS. Each of these options has its own advantages and disadvantages. The primary decisions that must be made are:

- Should DGH adopt a commercial-off-the-shelf system (COTS) or a bespoke RMS?
- Should the RMS be operated in-house, or should it be outsourced?
- Should data collection be done internally, or should it be outsourced?

The main advantage of bespoke systems is that they are tailored to an individual road agency and thus can better reflect the decision-making needs and business processes of that particular organisation. Because of this, a bespoke system may more readily obtain a high degree of institutional acceptance. On the downside, bespoke systems are often expensive to develop and maintain. Further, the organisation commissioning a bespoke system will not benefit from the broader base of user group feedback that goes into designing and improving a COTS. COTS are often more robust, flexible, and technologically up-to-date, as they are used by many different road agencies over the years and upgraded accordingly. They are likely to be accompanied by tried-and-true, effective training programmes. The 2005 World Bank survey mentioned earlier found that these advantages outweigh any drawbacks, and COTS should be preferred over bespoke systems wherever possible.

Developing and maintaining enough expertise in-house to successfully operate an RMS is a daunting challenge. Not only does it require skills in running standard analyses, but also in system and model calibration, development of enhancements, and systems testing – responsibilities that may fall on the shoulders of a small number of staff. Hence, some organisations that have outside expertise available to them choose to outsource system operation. Although this may result in less complex use of the RMS, it also tends to lead to a higher quality of output. Thus, in situations like the one faced by DGH, where it will probably be difficult to maintain and retain sufficient expertise inhouse, outsourcing is generally considered to be the better option, provided that the local or regional industry is suitably qualified.

Implementing an RMS is no easy task, and many efforts have failed.

Data collection on various aspects of road characteristics is typically done annually and thus for a few months of the year it puts severe stress on the resources of any organisation that undertakes it.

Outsourcing may mean that lower tech solutions are used in the collection process, as the local industry to which the task is outsourced may not be able to get a sufficient return on investment from acquiring high tech equipment that would then be left idle for most of the year. However, experience shows that if data collection is outsourced, deadlines are often adhered to more strictly and data quality tends to be better. Getting the data collection right is of utmost importance to the institutionalisation of the RMS, as the success of all other tasks ultimately relies on the quality of the data. Proper data collection is one of the most challenging aspects of implementing a successful RMS, and one of the most common areas where failure occurs. It is very difficult to find sustainable solutions, but many organisations have successfully outsourced data collection.

The IIRMS database is capable of recording data on ongoing works, but these features are not currently in use.
Photo by Rahmad Gunawan

The External Environment

The review concluded that while there are recommendations that can be applied to the current IIRMS itself, external issues must also be addressed to achieve real improvements in using the IIRMS effectively. The IIRMS should be calibrated and control parameters should be updated. But more significantly, the data collection process needs to be re-engineered, and the surrounding business processes must be improved. If these important issues are not addressed in the short term, the value of an upgraded IIRMS (or its replacement) will diminish. Further, significant training should be undertaken to enhance staff capabilities in system operation and management and to improve DGH capacity to apply system output to multi-year programming and strategic planning. Both introductory training for new staff and regular refresher courses are important.

Business processes should clearly detail all tasks necessary to carry out planning and programming activities, including the activities and steps within

Prakarsa Compendium

each task. Clear responsibilities should be assigned, and tasks should specify what input is needed and what output is expected to be generated. The links among tasks should be spelled out. Finally, the processes should include a timeline for completing all tasks.

Data collection processes should be entirely re-engineered. This should include revision of the type of data collected (for instance, bearing capacity should be included); frequency for the data collection (not all data needs to be collected annually); and coverage (not all data needs to be collected for the entire network each time). As part of this re-engineering, it is recommended that data on road surface conditions should be collected using digital imaging equipment, in order to remove the element of subjectivity. This is expected both to improve the quality of the data, which is essential to IIRMS success, and possibly to reduce survey costs. As digital imaging equipment is complex and expensive, it is recommended that the equipment rest with the Institute of Road Engineering, which would then be contracted by DGH to undertake the necessary surveys.

As part of the improved data collection framework, quality assurance activities should be detailed and strictly adhered to. Quality assurance should be undertaken before, during and after data collection, and these activities should be fully reported and closely monitored.

By following the recommendations of the review team, DGH can maximise its use of resources to maintain and develop sound networks throughout Indonesia. One of the most important recommendations – that DGH, in the medium term, replace its current bespoke IIRMS with a commercial off-the-shelf RMS – has been reviewed with and accepted by DGH representatives. The benefits, especially in terms of system management and training, two issues that have historically provided significant challenges to DGH, should be substantial. •

NOTES

1. Kevin McPherson and Christopher R. Bennett. Success Factors for Road Management Systems. World Bank. October 2005.

About the author:

Jens Chr. Helbech Hede is head of the Roads and Highways Department at Ramboll Denmark (East), which is part of the Ramboll Group, the leading engineering consultancy company in Nordic Europe. For the past 15 years Jens has done intensive work internationally on road asset management. His roles include team leader and technical expert on the development and implementation of road asset management systems. He has provided technical assistance to road organisations in Europe, Africa and Southeast Asia, and has assisted development partners (donors) in surveys, project preparations and technical reviews.

Road Development by the Numbers

Rp 3 billion/km
The average cost of road preservation treatment in 2009–10. The number is high in comparison to international norms.

13%
The amount of improvement seen in road conditions over a 10-year period in Sydney, Australia when performance-based contracting was instituted.

150 km/year
The expansion of the expressway network that the Directorate General of Highways needs to achieve to meet demand for competitive economic growth.

677 km
The total length of toll roads in Indonesia. An additional 140 km/year is planned, at a cost of about Rp 1.7 trillion/year.

42
The average speed of travel on Indonesia's national road network.

The Expert View

The Question: "Indonesia has been piloting the Medium Term Expenditure Framework (MTEF) approach in several important ministries. In your opinion, what are the greatest benefits to Indonesia from introducing an MTEF approach, and what are the key challenges that lie ahead?"

Ir. Aryawan Soetiarso P, M.Si.
Head of Road Transportation Sub-directorate
Directorate of Transportation, Bappenas

"The Government's policy of applying a Medium Term Expenditure Framework (MTEF) is part of its planning and budgeting reform. It is designed to ensure that resources are used efficiently and effectively in accordance with established priorities. The MTEF is also intended to create a sound and sustainable budget by applying the concept of aggregate fiscal discipline. The planning and budgeting reform that applies the MTEF concept must also apply the concepts of unified budgeting and performance-based budgeting. This will illustrate how efficient allocations can be achieved by a certain work unit/organisational unit, and thus operational efficiency will be achieved. The preparation of the annual State Revenues and Expenditures Budget (APBN) has been wasting time and energy. The selection of development targets, estimation of the Government's financial needs, and the availability of funds for the development and maintenance of road infrastructure must await the Government's annual funding, which is a 'resource envelope' on the annual availability of funds. The application of MTEF will provide ministries and institutions with certainty as they set their performance goals and targets, because they will be able to know the baseline funding allocations, which have been adjusted to the Government's financial capacity, for several years in advance.

A Unified Budget combines the operational budget and the investment budget, and it no longer differentiates between the routine budget and the development budget. Because of this it is more flexible and it is easier for ministries and institutions to use the budget to achieve designated performance targets. Ministries and institutions not only focus their attention on the budget for the construction of new road infrastructure and improvement of road capacity, but also on routine maintenance and rehabilitation in order to preserve assets and service quality. The previous scheme was very rigid and prioritised development activities over routine activities. The amount of budget allocated for development was prioritised and used as a parameter for successful performance of road administration. Budget allocations for routine maintenance and rehabilitation were often included in the development budget in order to show an increase in development budget. Therefore, budget allocations for maintenance and rehabilitation were very small in the past compared to the development budget.

Policies on MTEF and performance-based budgeting have changed programming and budgeting systems and strategies from being input-based to being outcome-based. Organisational units and users of the budget will have greater clarity and responsibility for achievement of the organisation's performance. Performance targets must be clear, measurable and, to the greatest possible extent, quantitative in nature, so that it will be easier to conduct short term evaluation (of outcomes) and long term evaluation (of impact). The results of these evaluations are then used to provide a solid foundation for the preparation of plans and budgets in the future. Therefore, it is necessary to apply the principles of 'money follows function' and 'function is followed by structure'. Initially, input-based development goals and targets, which were based on the amount of available funds, did not take into account the outcome to be achieved. Under MTEF, input-based performance (based on funding availability in the forms of the length of road to be maintained, rehabilitated, and improved, as well as new roads to be constructed) has been changed to outcome-based performance in the form of road condition. These policies must of course be implemented gradually, by improving the capacity of human resources and using the required software. The application of MTEF followed by the application of performance-based contracting in road preservation will further increase efficiency and effectiveness, and will enhance the quality of road management under the National Medium Term Development Plan for 2010–2014.

Among the challenges are finding a programme design that will generate the information about performance that is needed in connection with responsibilities for allocating and implementing the budget. It is also a challenge to handle changes in budget management and technical design strategies, along with external factors related to the political system, political culture, fiscal conditions, and so forth. Accordingly, we need a clear set of priorities, a focus on results, inter-organisational coordination, and support for the decentralisation process, as well as the creation of a climate that invites learning and comparison. Willingness to make such changes and create a shared mindset among all stakeholders will greatly determine the successful implementation of this concept."

more ▶

The Expert View

continued from previous page

Ir. Poernomo
Director of Engineering
Directorate General of Highways
Ministry of Public Works

"The biggest benefit that potentially can be reached is the shift in focus from basing the budget on inputs to basing it on outputs and outcomes. This will make it easier to evaluate whether the anticipated strategic targets are achieved. Many kinds of challenges will arise as MTEF is implemented, such as shifting mindsets from input-based to output- and outcome-based; the need to improve human resources in order to structure mid-term expenditure planning; and the need to build an accurate, transparent and reliable system of supporting data."

Dr. Agus Prabowo
Deputy for Strategy and Policy Development
Agency for Government Goods/Services Procurement Policies
Governmental Procurement Policy Institute

"The MTEF reflects the State's trust that ministers and heads of institutions can act as 'budget users' to oversee medium term development cycles in a comprehensive fashion, starting with identifying needs, planning, and internal coordination, up through the execution of national expenditures and including monitoring and evaluation, in an independent but responsible manner within each ministry/institution. This is in keeping with the spirit of democracy: authority is granted, but at the same time there is corresponding responsibility! The budget user's authority to manage budget policy is implicitly acknowledged by Law no. 17/2003 on State Finance and Law No. 1/2004 on the State Treasury.

When the MTEF is implemented consistently, it will be regarded as a strategic aspect of policy on government procurement of goods and services. One of the biggest advantages that will be obtained is that the authority to approve multi-year contracts will be within the scope of each budget user's authority. It will no longer be necessary to ask permission from the Minister of Finance (MoF). This situation will enable processes for the procurement of goods and services to operate more smoothly.

As laid out in Perpres no. 54/2010 on Government Procurement of Goods and Services, approval of multi-year contracts (that are in the national budget) resides with the MoF. Other ministers and institution heads are only given authority to approve multi-year contracts when the amount is below Rp 10 billion. Further, this authority is only for specified activities like the planting of seeds and seedlings, reforestation, air and sea pioneer services, food and medicine in hospitals, food for prisoners, excise duty stamps, trash disposal services, and procurement of cleaning services. This practice is inadequate. What about other work that often needs multi-year contracts, such as developing roads, bridges, and other physical infrastructure?

What are the challenges? There are at least two issues we are now facing. The first is that the minister or institution head must be able to convince parliament, as the institution which has power over the budget, that the proposed overall framework for development and budget request is justified and fitting with national development goals over the long term. Second, the MoF must be convinced to be willing to hand over a portion of its budget authority to heads of ministries and institutions. Up until now MoF is still halfheartedly letting go of fiscal authority. Isn't it true that MoF is often heard to say 'let the managers manage'? If they are certain of this pronouncement, then certainly the MTEF should be immediately implemented, so that adequate authority to approve multi-year contracts resides with each ministry/institution head."

Ir. Harris H. Batubara M.Eng.
Director of Planning
Directorate General of Highways, Ministry of Public Works

"The implementation of the MTEF approach can minimise uncertainty in governmental planning and improve the consistency of performance in ministry and governmental institutions with respect to their strategic planning. A big challenge for implementing the MTEF approach is to synchronise it with government's one-year (fiscal year) budgets and the possibility of unstable government income (tax and non-tax revenue)."

Urban Mobility

April, 2011

KEY POINTS *on Urban Mobility*

Historically, urban transport planners were focused on reducing congestion. Often they recommended building new roads and improving conditions for motorised vehicles. This stimulated further growth in car usage, resulting in greater economic and environmental problems. It is now understood that the focus should be on improved mobility, changing the way people use roads, and offering attractive public transport options. Improving mobility is less about engineering and more about changing behaviour. It therefore has a very important social dimension and involves many stakeholders who normally would not work together. The objective is to create a highly efficient, flexible, responsive, safe, and affordable urban mobility system with the least amount of traffic, travel, and effort while ensuring environmental sustainability. This means giving priority to public transport, pedestrians, non-motorised vehicles, and vehicles transporting goods. Across the globe, cities in Europe, Brazil, Colombia, and India are developing effective urban mobility policies that lead to benefits such as reductions in congestion, noise, pollution, energy consumption, travel time, and traffic accidents; while improving the quality and accessibility of public transport, increasing available public spaces, and contributing to citizen health and well-being. Indonesia can adopt best practice from these examples to develop its own effective urban mobility strategies.

An Introduction to Urban Mobility

Cities around the world face similar struggles with traffic congestion and vehicular pollution. Past attempts to solve the problem have only made it worse, but newer approaches offer ideas that may have relevance to Indonesia.

Peter Midgley

For many years, urban transport planners have attempted to reduce congestion. Many transport studies from past years begin with language that reads, “Congestion is on the increase and here are steps to reduce it.” In most cases, such studies recommend overcoming congestion by improving conditions for vehicles, particularly motorised ones such as trucks, buses and private cars. Authors of these studies believed the solution was simple: build the roads necessary to meet demand.

But something went wrong. The roads that were built stimulated even more growth in car ownership and usage. The results were ever-increasing congestion, economic inefficiencies, pollution, and other forms of environmental degradation. Clearly this approach has not worked. But what is the alternative?

As a senior Indonesian transport expert recently observed, “We have to stop trying to reduce congestion; we have to start improving mobility.”

Cities around the world are concerned with the flow of goods and people. This scene shows Paris traffic as seen from the Arc de Triomphe. *Courtesy of BrokenSphere on Wikimedia*

He is right. Times are changing, and many cities throughout the world are now focusing on improving mobility, with impressive results. Singapore is a shining example of what can be achieved by concentrating less on building roads and concentrating more on changing the way people *use* roads, as well as providing a first class and affordable public transport system.

Many cities in Europe, Brazil, Colombia and India are now developing mobility strategies and implementing measures designed to improve mobility for all citizens, not just those travelling by private car. The city of Guangzhou is leading the way in China, and mobility improvement measures implemented in New York enabled the city to win the Sustainable Cities award in 2010 (something that would have been inconceivable even five years ago).

What Is "Urban Mobility"?

Improving urban mobility means focusing on the movement of people and goods rather than the movement of vehicles. The objective is to create a highly efficient, flexible, responsive, safe, and affordable urban mobility system with the least amount of traffic, travel, and effort while ensuring environmental sustainability. This means giving priority to public transport, pedestrians, non-motorised vehicles, and vehicles transporting goods. It means providing attractive and efficient public transport services and reducing the demand for motorised travel by car or motorcycle. It also means making the best possible use of existing roads and transport services before investing in new ones.

Improving mobility is less about engineering and more about changing behaviour. It therefore has a very important social dimension and involves many stakeholders who normally would not work together to "reduce congestion" because that is regarded as strictly a transportation issue. Improving mobility starts with public participation, consultation, focus group discussions, consensus building, and cooperation among different stakeholders.

Improving urban mobility is more about outcomes than outputs. For example, rather than measuring the number of additional kilometres of footpaths provided, it is more important to consider the use of these footpaths and whether they improve accessibility, safety, health, and similar concerns.

Improving mobility is more about working together than writing reports. It involves people in the fields of transport, environment, economic and social development, city and town planning, employment, and housing sitting down together and joining forces with social organisations and businesses to develop comprehensive approaches towards improving urban mobility. It is inclusive rather than exclusive and involves all sections of society.

Learning From Others

An important ingredient in sustainable mobility planning is the willingness of cities to try out new ideas and learn from each other. From around the world, there are many successes to consider. Most cities that have implemented sustainable urban mobility plans and measures report the following results:

- Decrease in traffic jams and congestion
- Diminished noise, atmospheric contamination, contribution to the greenhouse effect, and accidents
- Lower energy consumption
- Reduction in average travel times
- Improvement of public transport services
- More public spaces available
- General improvement in accessibility, including for the disabled
- Reduction of external costs
- Increased health among inhabitants due to less contamination and increased bicycling and walking
- Increased quality of the urban environment and quality of life among the citizens

With these results in mind, it can be helpful for policy-makers and stakeholders in Indonesia to observe how urban mobility strategies are unfolding in other countries and regions. Although a comprehensive review is beyond the scope of this article, here are a few highlights that illustrate

some of the national-level approaches that can be used to support and encourage city-level improvements in mobility.

Europe

The European Commission's first urban mobility initiatives, which relied heavily on public participation under the "Citizens' Network," date back to 1995 and 1998. Since 2002, through its CIVITAS initiative, which encouraged cities in different countries to work together, the European Union made available € 180 million (about Rp 2.2 trillion) to cities across Europe to implement and evaluate a wide range of innovative measures to promote sustainable urban mobility[1].

As a result of this initiative and a six-month intensive consultation process, the European Commission adopted the Green Paper *Towards a New Culture for Urban Mobility* in 2007. This opened an even broader debate on urban mobility and enabled the European Commission to adopt an Action Plan on urban mobility in 2009. The Action Plan comprises 20 measures to improve urban mobility throughout Europe by 2012 with € 8 billion (over Rp 97 trillion) in available funding. Among other steps, the action plan seeks voluntary commitments from public transport providers related to passenger rights; supports research on lower and zero-emission vehicles; and creates links between policies on urban mobility, health, and disability. It also includes public awareness campaigns and a travel information initiative, as well as guidance on urban freight distribution and intelligent transport systems. Further, it promotes harmonised statistics and information sharing within and beyond the border of the European Union[2].

Brazil

The first draft National Policy on Sustainable Urban Mobility was published in 2004. It was approved in 2007 and comprises 29 directives and nine guiding principles to improve urban mobility. It requires each city with over 500,000 inhabitants to produce an urban mobility plan[3]. In addition, the Ministry of Cities has developed an urban mobility programme to allocate resources to metropolitan areas and cities that have established urban mobility plans. Funds are channelled through the Federal Savings Bank ("Caixa Econômica Federal") to state governments who are responsible for the management of metropolitan areas in Brazil. Counterpart funding is required from the state governments. The Ministry of Cities is responsible for the appraisal and selection of proposals submitted by the states. The Federal Savings Bank, acting on behalf of the Ministry of Cities, is responsible

Many cities in Europe, Brazil, Colombia and India are now developing mobility strategies and implementing measures designed to improve mobility for all citizens, not just those travelling by private car.

A focus on safe, comfortable and affordable public transit is an important part of an effective urban mobility policy. Here, passengers queue for public transit in Curitiba, Brazil. *Courtesy of Adam Jones (adamjones.freeservers.com)*

for disbursements of funds, supervision of project implementation and the monitoring and evaluation of the results. The Ministry of Cities has published guidelines for developing urban mobility plans and for submitting proposals.

France

The French National Urban Mobility Policy aims at coordinating the initiatives of the different agencies concerned with public transport, roads, parking, and urban planning in collaboration with the commercial sector and the general public. The objective is to ensure mobility and access for all, while protecting the environment by encouraging the use of alternatives to the car that use less fuel and cause less pollution – such as public transport, walking, and the bicycle[4].

Each city in France is required to have an urban mobility plan that is compatible with national sustainable development objectives. Each plan defines the travel policy to be followed to improve urban mobility in the context of safety, health, social cohesion and urban development, parking, goods deliveries, fares, etc. and it is reviewed every five years. Cities that adopt an urban travel plan are allowed to impose a *Versement Transport*, which allows them to collect public transport fees from companies.

To date 50 cities, representing three-quarters of towns and cities with more than 100,000 inhabitants in France, have approved urban mobility plans. In addition, almost as many smaller towns have started a voluntary urban mobility plan process[5].

India

The objective of the National Urban Transport Policy (NUTP) for India is to ensure safe, affordable, quick, comfortable, reliable, and sustainable access for the growing number of city residents to jobs, education, and recreation. The national policy stresses the importance of public consultation. In addition, it emphasises the need to learn by doing through pilot projects[6]. Under the NUTP, cities are required to have comprehensive mobility plans and they receive financial assistance (up to 80 percent of total costs) from the central government for preparing them. These plans are designed to focus on improving the mobility of people rather than vehicles. Accordingly, they give priority to pedestrians, non-motorised transport, public transport (all modes), intermediate public transport (informal and paratransit), and the development of integrated land use plans. They include short, medium, and long term measures to improve mobility in a sustainable manner, reduce travel demand, and develop networks for public transport as well as non-motorised transport.

Funding is assured through the centrally funded Jawaharlal Nehru National Urban Renewal Mission and is already being applied in 63 cities across India. In addition, and as a result of establishing the NUTP, the Ministry of Urban Development has been able to apply to the Global Environmental Facility for a grant of US$ 25 million (about Rp 223 billion) along with up to US$ 200 million (Rp 1.78 trillion) co-financing from the World Bank, to assist in the development of sustainable urban mobility solutions. Counterpart funds amounting to US$ 150 million (Rp 1.34 trillion) are being provided by the central government, state governments, and implementing agencies at the city level. The project is being implemented in 10 cities and demonstration projects have already commenced in five of them.

The Future in Indonesia

Although a policy framework and associated legislation has yet to be established in Indonesia for the types of activities outlined above, current legislation and regulations allow for beginning programmes to improve urban mobility. As an example, the Indonesia Infrastructure Initiative (IndII) is currently working with the city of Surabaya to develop urban mobility guidelines and to support the city's desire to improve facilities for pedestrians and non-motorised transport as well as improve the public transport system, safety, and area traffic control. Focus group discussions on how to improve mobility in the city have been initiated with key stakeholders and further public consultations are planned. Through a process of progressive engagement, IndII is ready to support pilot projects to assess how best to improve mobility in Surabaya as well as in other cities throughout Indonesia. These measures will not only improve mobility but will also overcome infrastructure bottlenecks by making better use of existing infrastructure facilities. (For more on the subject of mobility in Surabaya, see "The Surabaya Story: Problems and Solutions for Improving Urban Mobility" on page 187.)

With its mega-city capital of Jakarta and growing urban populations in other cities, Indonesia faces huge problems and opportunities in improving mobility. Great strides can be made when governments at all levels give priority to public transport, goods vehicles, pedestrians, and non-motorised vehicles; provide attractive, affordable, and efficient public transport services and reduce the demand for car/motorcycle travel; and make better use of existing roads and services before investing in new ones. The issue is not only a government concern – improving mobility involves public participation, consultation, focus group discussions, consensus building, and cooperation among different stakeholders. •

NOTES

The following references are available online at the global Transport Knowledge Partnership (gTKP) website, www.gtkp.com:

1. Promoting sustainable urban mobility with CIVITAS
2. Towards a new culture for urban mobility: Green Paper and Action Plan (EU)
3. The implementation of Brazil's Sustainable Urban Mobility Policy
4. Urban transport in France
5. Urban mobility plans and accessibility
6. National Urban Transport Policy (India)

About the author:

Peter Midgley is IndII's Urban Mobility Advisor and the Team Leader of the IndII-funded Surabaya Urban Mobility Project. He is also the Urban Mobility Theme Champion with the global Transport Knowledge Partnership (gTKP). Peter has over 40 years of experience in urban transport. He was a staff member of the World Bank for 25 years. He drafted the Bank's first regional urban transport strategy paper (*Urban Transport in Asia: An Operational Agenda for the 1990s*) and was a member of the core team that designed and put into operation the World Bank's knowledge management strategy. He has supported the needs of sustainable urban mobility throughout his career.

KEY POINTS *on Urban Mobility in Surabaya*

Indonesia's second largest city Surabaya is experiencing increasing congestion. Motorcycles in particular are contributing to noise and air pollution and are operated in an illegal and unsafe manner. Measures that could improve the situation, such as public transport and demand management, are limited. Microbuses and a small fleet of public buses vary widely in the quality of services they offer.

The city is making progress in dealing with these challenges, particularly through pedestrian improvements such as pavements and zebra crossings. Plans are underway for a network of bicycle lanes, feasibility studies for Bus Rapid Transit (BRT) corridors are complete, and commuter rail service will be enhanced.

Significant political commitment will be needed to move forward, starting with the development of a comprehensive urban mobility strategy that addresses the region as a whole. The strategy should focus on the movement of people and goods; give priority to public transport, pedestrians, and non-motorised vehicles; and improve the link between land use and transportation planning. A network of affordable, accessible, and high quality BRT is a promising option. Complementary measures such as expanding non-motorised and pedestrian facilities and parking management are also worth considering.

The city has already experienced some successes, for example with a "car-free" Sunday morning, suggesting that the potential exists to achieve a vision of improved mobility and quality of life in Surabaya.

The Surabaya Story: Problems and Solutions for Improving Urban Mobility

Faced with the same problems plaguing many Indonesian cities, Surabaya shows potential to achieve greater urban mobility and quality of life.

William Vincent

With roughly 7 million inhabitants in the metropolitan region, Surabaya is Indonesia's second largest city and the commercial centre of East Java. It is characterised by a large trade and commercial centre, a thriving and growing port, and expanding suburban areas outside of the city limits.

Like many developing cities, Surabaya is experiencing rapid growth in private motor vehicles. In 2005, there were approximately 1.5 million vehicles, of which 1.1 million were motorcycles and 0.26 million were private cars. By 2009, the number of motorcycles had grown nearly threefold, to 2.98 million, and the number of private cars had doubled, to 0.52 million.

The growth in private motor vehicles is creating significant challenges for the city. Traffic congestion can be severe at all times of the day. During peak hours, much of the city centre is congested, with the greatest vehicle flows operating in a north-south direction. The problem is exacerbated by conflicts among the wide range of uses on the roads, including motorised vehicles, *becak* (pedicabs), handcarts, and pedestrians.

Bicyclists enjoy the car-free morning on Jalan Darmo Raya.
Courtesy of William Vincent

The growth in motorcycles is creating particular challenges. Motorcycles are inexpensive and can be purchased on credit. They create extensive noise and contribute substantially to regional air pollution. Law enforcement is poor or nonexistent in many places, resulting in motorcycles operating on the sides of roads and on pavements. During rainstorms, motorcyclists frequently park in bus shelters, rendering the shelters inaccessible to bus passengers.

Motorcycles also create safety problems. They weave in and out of traffic and frequently operate between lanes. It is not uncommon to see entire families riding on a single motorcycle, usually with the children not wearing helmets or other protective equipment. Informal interviews and media reports suggest that there are a significant number of injuries and deaths associated with motorcycle use.

As motor vehicle use and traffic congestion increase, measures that could reduce the impact of this growth, such as public transport and demand management, are limited or nonexistent. Most public transport services are provided by a fleet of more than 5,000 privately owned microbuses, known as *angkot*. The angkot operate on fixed routes and pick up and drop off passengers at almost any location along these routes. Service quality is highly variable, with many old and poorly maintained vehicles.

Surabaya also has a small fleet of state-owned and operated public buses. These buses operate primarily in north-south corridors and, like the angkot, vary widely in quality.

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Signs of Progress

Although Surabaya faces many urban mobility challenges, the city has been making progress in recent years, most notably regarding pedestrian improvements. The city centre contains new, high quality sidewalks as well as raised pedestrian crossings with zebra stripes at many intersections.

The mayor has made expansion of pedestrian improvements a high priority. Surabaya is also planning a network of bicycle lanes and engineering design on these lanes may be completed in 2011. Feasibility studies on several Bus Rapid Transit (BRT) corridors have been completed, and the national government is planning to enhance existing commuter rail service.

Although these plans are steps in the right direction, making substantial and lasting progress toward more sustainable and environmentally friendly transportation will take significant commitment and leadership. The starting point should be the development of a comprehensive urban mobility strategy.

The strategy should address the needs of the region as a whole, not just the city of Surabaya. Less than half of the regional population lives within the city limits, resulting in much of Surabaya's traffic being generated outside of the city, such as by commuters living in Sidoarjo.

The strategy also should focus upon the movement of people and goods, rather than adopt the more traditional approach of focusing upon the movement of vehicles. Among other things, this means making more efficient use of existing infrastructure, such as by giving priority to public transport, pedestrians, and non-motorised vehicles, and improving the connection between land use and transportation planning. Much of the planning to date appears to have focused on the movement of vehicles, resulting in a relatively robust but congested road network and relatively poor facilities for public transportation, non-motorised vehicles, and pedestrians.

Finally, the strategy should be developed through a strong stakeholder and public participation process. Shifting the planning focus from the movement of vehicles to the movement of people is a fundamental change in thinking and approach. Building consensus and support among stakeholders and the public is essential to achieving this shift.

Once completed, the strategy will provide the vision for urban mobility in the region, establishing a framework under which specific programmes and activities can be developed and implemented. One promising programme would be to build upon existing feasibility studies by implementing a network of BRT services, providing an attractive alternative to private vehicle travel.

To be successful, a BRT in Surabaya would likely require a number of key characteristics, including:

- Private sector operations with public sector oversight
- High quality standards
- Frequent, reliable service
- Low fares
- Dedicated lanes with strong enforcement to prevent motorcycles and other unauthorised vehicles from using the lanes
- A network to provide service to a large portion of the city centre
- Feeder services and park-and-ride lots to encourage people to leave their motorcycles at home
- Participation by, and support from, key stakeholders, such as angkot owners and operators.

To optimise the success of a BRT network, Surabaya should also consider complementary measures. These could include expanding non-motorised and pedestrian facilities (consistent with current plans in the city), parking management, road pricing, congestion charging, traffic management, and traffic calming.

Surabaya already has experienced great success in some of these areas, at least in a limited way. Every Sunday morning, the city hosts a "car-free" morning on Jalan Darmo Raya. For roughly four hours, this six-lane, major arterial road is cleared of all traffic and barricades are established on side roads. In effect, the road is transformed into an urban park, and people appear by the thousands to play soccer, ride bicycles, and to enjoy a brief respite from the otherwise constant drone of motorcycles, cars, and angkot.

The success of the car-free morning is proof that Surabaya can successfully manage traffic and that the people of Surabaya will respond positively to transportation measures that improve quality of life. The challenge for Surabaya is to articulate a broader vision of sustainable transport, to develop programmes to achieve that vision, and to build the support necessary to implement those programmes. •

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William Vincent is the Deputy Executive Director and General Counsel of Breakthrough Technologies Institute. He has more than 20 years' experience in executive and professional positions in Washington, including public policy, media relations, programme development and management, and legal counsel. He served in the U.S. Department of Transportation during the Clinton Administration, overseeing the development and implementation of several transportation safety programmes, as well as the Department's research and technology programmes. Among other things, he was responsible for reauthorisation of several titles of the nation's transportation legislation ("TEA-21") as well as the Pipeline Safety Reauthorization Act, and he helped manage communications following several major transportation disasters. He received a number of awards for his service, including the Secretary's Team Award and the Administrator's Award for Excellence. More recently, he has been developing and managing programmes to promote alternative energy and sustainable transportation. He is a frequent author and presenter on a range of topics, including urban mobility, BRT services, the relationship between land use and urban transportation, and hydrogen and fuel cells for both stationary and transportation applications.

KEY POINTS *on Managing Angkot in Bogor*

Ten-to-twelve-seat minivans called *angkot* dominate public transport in Bogor. Angkot operate on fixed routes at high frequencies that minimise wait times. They stop wherever passengers want and operate without public subsidies. This may sound ideal, but angkot operators face declining patronage and revenues. The best driving strategies for maximising short term revenue – lagging to pick up more passengers, then racing to the next pick-up point – contribute to congestion. Dissatisfied passengers increasingly opt to travel by motorcycle instead, further adding to congestion.

In 2009 Bogor introduced a shift system to address this problem. Only the "A" or the "B" shift operates at one time, halving the number of angkot on the road. Driver revenue is unchanged as they take in twice the fares but work half as often. The increase in wait time for passengers is negligible because the original number of angkot was so high. On routes where a two-shift system results in load factors that are too high, a three-shift system is used and two of the three are on the road at the same time.

The shift system operates successfully on 11 of the city's 23 routes. The other 12 routes are shared by city angkot and angkot licensed by the district. If city angkot use the shift system but district angkot do not, revenues will shift toward district angkot. For the system to be fair, there must be an agreement involving both the city and the district.

Additional initiatives that can relieve congestion include using a smaller number of larger buses. Another strategy is to construct a bus terminal that brings traffic from outlying areas to that point, after which passengers transfer to city buses. These strategies that reduce the number of vehicles on the road achieve greater mobility for citizens.

Solving Bogor's "Angkot Problem"

An oversupply of angkot has created congestion and safety problems in Bogor, but effective solutions are being adopted.

David Overington

Angkot are by far the dominant mode of public transport in Bogor, a city of approximately 1 million located about 50 km south of Jakarta. More than 8000 angkot vehicles are licensed to carry passengers in the city. These 10–12 seat minivans can be seen almost everywhere, operating on fixed routes at very high frequencies, stopping to let passengers on and off wherever they want. The high frequencies mean that passenger wait times are low. The high route densities mean that passengers can usually easily complete the first and last legs of their journey on foot. And the services operate without any public sector funding or subsidies.

From this brief description, angkot sound like the ideal public transport system: one that many modern Western cities might at first glance be

keen to adopt. However, the angkot system is facing serious problems and is contributing to serious urban transport problems within Bogor.

Angkot operators and city residents are both feeling the negative effects of the current system. For operators, the single biggest problem is declining patronage and declining passenger revenues, which undermine the financial viability of the industry. This situation is due to a combination of several factors, including public dissatisfaction with angkot travel conditions and growing competition from motorcycles, which more and more people are able to purchase thanks to increasing access to low cost financing. Because of their low roof and door height, angkot are not easy to board or disembark from and they are not overly comfortable to travel in, particularly on hot days in crowded conditions. And they are relatively slow – especially compared to travel by private motorcycle.

The current angkot situation is a problem for city residents as well. There are two facets to this problem. First is the sheer number of angkot vehicles (see Table 1), often with low load factors, taking up limited road space.

Second, the competitive driving practices adopted by angkot drivers to maximise patronage and revenues create congestion and safety problems. On many occasions, angkot drivers deliberately drive as slowly as possible, hanging back as far as possible from any competing angkot ahead, to allow the maximum possible number of passengers to accumulate after the angkot ahead has already passed by. This of course holds up other motorists (and competing angkot), to the annoyance of all. It is also very frustrating for passengers already on board, who simply want to get to their destination as fast as possible. An angkot behind the one that is hanging back has two choices – to adopt the same tactic, driving even more slowly, or to drive as fast as possible in an attempt to pass.

Table 1: Angkot Licensed to Operate in Bogor City (2002 – 2010)

Angkot				Total
Year	City	District	Other	
2002	2460	6976	1987	11,423
2003	3506	4827	1987	10,320
2004	3506	4827	1987	10,320
2005	3506	4827	1987	10,320
2006	3506	4827	1987	10,320
2007	3506	4827	1987	10,320
2008	3425	4827	1987	10,239
2009	3425	4827	1987	10,239
2010	3413	4644	1879	9936

Source: Bogor City records

It is also not uncommon to see angkot stopped at intersections or double parked – in either case obstructing traffic flows – as their drivers wait for passengers. As exasperating as all this may be, these are rational behaviours for drivers who are trying to maximise patronage and revenue over the short run.

Introducing a Shift System

Mindful of these issues, the Bogor City Angkot Association and the Bogor City Government have been working together to identify and implement a range of measures to improve the situation. In 2009, a shift system was introduced. Under this system, an equal number of angkot vehicles on a given route are assigned to an "A" or a "B" shift, and on some routes to a "C" shift as well. Where the A and B shift system is implemented, only the A shift vehicles operate on certain days and only the B shift vehicles operate on the other days. This results in several improvements: the number of angkot competing on that route at any time is halved, and less competitive driving practices can be employed. In addition, the fares taken in per shift are doubled, but with each driver and vehicle combination doing only half as many shifts, total takings remain unchanged.

For passengers, the service frequencies are halved, but the frequencies were already so high – as many as three to four services per minute – that the frequency reduction is almost unnoticeable and any patronage loss due to reduced frequencies will be imperceptible.

Where an A, B and C shift system is adopted, two of the three shifts are permitted to operate at any given time. This three-shift system has been implemented on routes where load factors would be too high if a simple two-shift system were implemented.

To date the shift system has been introduced on 11 of the city's 23 angkot routes. It has reduced the number of angkot operating in the city on any given day by almost 700 vehicles, equating to an 8 percent reduction. This can be regarded as a significant achievement, having a positive impact on urban traffic conditions (fewer angkot, with less competitive driving practices), no loss of income to the angkot drivers (who typically double their income while working, but only work half as much), and with almost zero adverse impact for waiting passengers and hence almost zero adverse impact on overall patronage or revenue.

Clearly for this shift system to work in a fair and equitable manner, all angkot on a given route need to observe the rules. If any angkot were to continue to operate as previously, then they would skew the patronage and revenue yields in their favour, to the detriment of the other angkot operators.

This is an issue that will need to be addressed before the shift system can be rolled out on any of the remaining 12 city angkot routes, since these routes are also served by district angkot. As can be seen in Table 1, of the more than 8000 angkot that are licensed to operate in Bogor City, over 4600 – more than half – are district angkot. These operate outside the city boundary, carrying passengers between the outlying provincial areas and Bogor City. Because they are licensed by the district government, they are outside the jurisdiction of either Bogor City or the Bogor City Angkot Association. Simply introducing the shift system to the city angkot whilst leaving the district angkot service levels unchanged would transfer a portion of customers and revenues from the city angkot drivers to district angkot drivers. Clearly a mutually agreed arrangement would be required between all of the city and all of the district stakeholders before the shift system could begin to be introduced on the remaining 12 city angkot routes.

There are also a number of other known initiatives that might also contribute to the reduction in the number of angkot operating in Bogor City. These include:

- The Governor's InterCity Transport Decree, which says that all intercity public transport services should use larger buses instead of 10–12 seat minibuses. If larger buses replaced minibuses on a (for example) 1:2 basis, then the number of intercity vehicles would be halved.

- Development of the Proposed Ciawi Bus Terminal. This terminal would be at the border between the city and the province. The city and district governments have already agreed that once the terminal is constructed, all district buses will terminate at this point. Passengers carrying on to Bogor City would transfer. If the buses they transfer to have a higher capacity, then a smaller number of those buses will be needed.

Clearly much has been done already to address the angkot-related problems in Bogor. And more can be done. The real test of success will not be simply a reduction in the number of angkot or other public transport vehicles on the streets, but whether improved urban mobility is achieved. •

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A Day in the Life of an Angkot Driver

As told to Andre Susanto

Photo by Andre Susanto

My route is from Baranangsiang bus station to Bubulak, about a 30 km route. And no, I can't tell you how long it takes me each trip. Sometimes as fast as 40 minutes, and sometimes almost two hours. While it does depend on traffic, most of the time I make that decision. In this, I am my own boss. If the angkot isn't full yet, it will take more money in gasoline to make the trip. So I have to make sure that somewhere along the route, it gets full at least once. That's why you see drivers stop and just wait for the fare. We'll yell out our destinations and you come aboard and choose one. When we get impatient or full, we go. Sometimes I pay that woman over there Rp 2000 to yell for me and get passengers to come on my angkot.

The angkot I drive is a Suzuki Carry 1.0. It has about 40 bhp [brake horsepower] and it gets about 7–8km per liter of fuel. While this is my baby, my bread winner, and I wash it every night, it is not mine. I rent it every day for Rp 100,000. The owner has several, and if I don't bring him that amount every day he can take my baby back and give it to another driver. It really is my baby as I am responsible for any and all damages that happen to her.

Each day I never know how many hours I have to work, and I don't get overtime. I have to make above Rp 100,000/day and that doesn't include gasoline, which costs about Rp 25,000–Rp 35,000/route.

If you get on my angkot, you'll find that it's clean and well maintained. Except for the broken headlights that I haven't got the money to fix. Oh, and the missing gas cap. It's a good thing it doesn't rain very much in Bogor as I haven't replaced the windshield wiper. But other than that, I've got a body kit to make her look lowered, cool purple lights outside and a blue dome light inside.

When you get off my angkot, you get the privilege of paying me Rp 2000. The price is the same whether it's for a short 10-meter hop in the rain or for going home to Bubulak from the Baranangsiang bus station.

HONK, HONK. Darn that "sexy" angkot! He stops anywhere just to slow me down. I'll show him! No, I'm not a pervert who thinks that angkot are sexy. But the one that I just passed is identified by a sticker on the back that says "sexy". The sticker lets everyone know that the "sexy" angkot are owned by the same person. That guy is so pushy about his drivers, and he runs two shifts on the angkot. Every two drivers share the same angkot and their shift is 12 hours long.

So now that we're almost to Bubulak, and you've been with me since Baranangsiang, you can see that on this route I've only earned Rp 8000 so far. Luckily we're full right now so by the time I reach Bubulak, I'll earn at least another Rp 24,000. So far we've driven about 30 minutes. So this run will take about 1.5 hours by the time I get back to Baranangsiang again. If I'm lucky I'll make Rp 50,000 on this run and after paying for the gasoline, I'll net about Rp 20,000. That's about average. I go home when I get tired or once I make over Rp 150,000 after taking money out for gasoline. Sometimes that takes about 12 hours or more of driving. I'm lucky that I get to have the car for the whole day. Some of these guys are on 12-hour shifts and share the car with another.

When it is raining, I can make more because many more people are willing to get on angkot for their short trips. Then there are other times where if I break even on the gasoline I'll be lucky.

HONK HONK HONK. Darn those other angkot! They're always scheming to slow down others behind them so they'll get the next fare. Stupid angkot drivers! Err...I mean except me of course. Look, that one is stopped and waiting in the middle of the intersection!

Well, here's your stop. We're at Bubulak station, I'm turning around. You what? You're going to go back to Baranangsiang? Crazy...that'll be another Rp 2000!

A note from the writer: This story is a composite of conversations with two angkot drivers in Bogor. I have used the figure Rp 100,000 as the daily amount the driver must pay the owner, but the actual figure can vary. The second driver I spoke with must pay Rp 130,000.

KEY POINTS *on Addressing Jakarta's Gridlock*

Jakarta's congestion is reducing its quality of life and competitiveness. Growth in Jakarta's financial and services sectors, increased wealth, growing population, and a relatively unchanged capacity in the public transport system have all led to more and more citizens using motorcycles and private cars. Meanwhile Jakarta's social boundaries continue to stretch, with a predicted population of 40 million by 2025. With today's average travel speed at peak times a mere 13–15kph, the challenge of moving people and goods in the future is monumental.

If Jakarta is to improve the use of public transport as cities such as Seoul, Taipei, and Bangkok have done, strong political commitment, long term financial support, and effective coordination are needed. The Office of the Vice President, through the Presidential Working Unit for Supervision and Management of Development (UKP4) is developing a conceptual framework to make this possible. Important components include: changing the focus from congestion relief to mobility management; varied stakeholder involvement; a fresh look at the role of and connections between all aspects of transportation infrastructure; and investment in "first and last mile" infrastructure, taxi stands, and paratransit. A well timed, step-wise approach such as used in Singapore, with adequate financing, consistent law enforcement, competent regulators, and capable operators will contribute to improved mobility, as will successful demonstration efforts and the establishment of a Jabodetabek Transport Authority.

Freeing Jakarta From Gridlock

Greater Jakarta's transportation system has been subject to many forces over the last decade. Strong political commitment is needed for the government to meet the demand for urban mobility.

Danang Parikesit

Moving people and goods in Jakarta is a nightmare. Every day, many commuters experience journeys longer than 120 minutes (considered an international threshold for bearable travel time). The congestion not only distresses travellers, but also creates an inefficient economy, reduces safety on roads, and produces pollution with both local and global environmental consequences. Jakarta has become one of the 10 most expensive capital cities in Asia (www.citymayors.com, 2011). The increasing cost of urban logistics has reduced Jakarta's competitiveness in attracting investment and has caused the national economy to suffer.

What has brought the transportation system of Jakarta and Jabodetabek (the Greater Jakarta area encompassing Jakarta, Bogor, Depok, Tangerang, and Bekasi) to this unhappy state? The situation is well documented in both academic literature and the popular press. In 2010, more than 100 media reports and articles about Jakarta's worsening congestion helped create national awareness on the decline in Jakarta and Jabodetabek's transport quality. National and international scientific journals have examined the decaying services from various perspectives, contrasting the situation in Jakarta with other Asian cities that have reduced congestion by increasing reliance on public transport (Morichi et al, 2011).

For the growing number of Jakarta residents who can afford them, motorcycles often offer a faster and more convenient way to travel than public transport. *Photo by Andre Susanto*

Jakarta in Perspective

Historically and for the foreseeable future, Jakarta and its surrounding areas are of critical importance to Indonesia. Jabodetabek's share of the Indonesian economy is enormous, reaching nearly 30 percent of the country's wealth pie. Although many Indonesian cities such as Surabaya, Makassar, Bandung, and Medan are catching up in terms of economic growth, their shares of GDP are still far below Jabodetabek.

Figure 1 shows how the city of Jakarta's contribution to GDP has changed over the last two decades. Between 1990 and 1995, Jakarta's share fell as suburbanisation increased and industries, especially manufacturing, relocated to surrounding districts and cities. Since 1995, Jakarta's share has been on an upward trend thanks to the growth of the service and financial sectors. The growth in these sectors creates an increased demand for a higher quality of urban travel.

Figure 1: Jakarta's Share of Indonesia's Gross Domestic Product

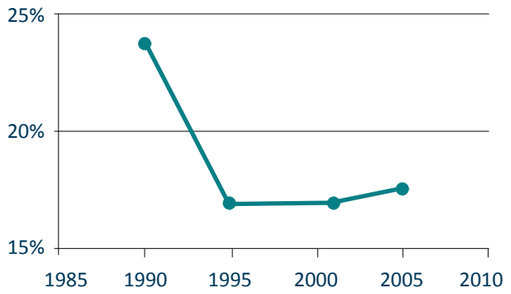
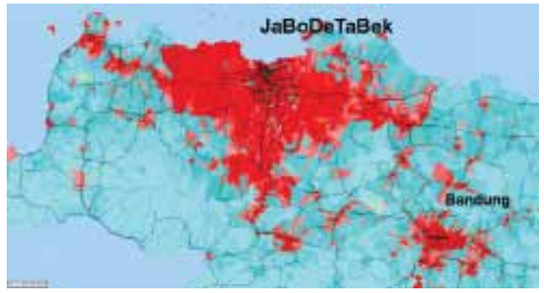


Figure 2: Projected Population Density of Greater Jakarta in 2025. Red areas are projected to be 90% urban by 2025.



Source: MTI, 2010, taken from DG Spatial Planning MPW, 2010

Rapid economic growth over the past 20 years has stretched Jakarta's social boundary to the entire Jabodetabek region, creating a megapolitan area with 27.5 million inhabitants. Figure 2 demonstrates the estimate of the Directorate General of Spatial Planning of the Ministry of Public Works (MPW) on the likely sprawl by 2025 if there are minimal policy interventions. Greater Jakarta will continue to grow, reaching a population of 40 million. Moving people during peak travel hours, especially given the limited public transport capacity, will be a monumental challenge. The future situation is almost unimaginable, given that today's average travel speed at peak times is 13–15kph. In comparison, urban travel speed in Japanese cities is 20kph and in cities of the United Kingdom it is 40kph (Ishida, 2010).

A Rapid Decline in Use of Public Transport

Recent reports show that the people in Jakarta have expenditures four times greater than the national average (Resosudarmo, 2010). Over the past decade, average income has increased (Coordinating Ministry of Economic Affairs [CMEA], 2011). In other words, the citizens of Jakarta are becoming richer and are willing to spend more money for their daily needs. Yet during this same time, the capacity of the public transport system has remained relatively unchanged despite the introduction of the TransJakarta Busway in 2004. Throughout Jakarta and Jabodetabek, bus routes have not been restructured or expanded and the frequency of operation has not increased. Urban commuter rail services operated by PT Kereta Commuter Jabodetabek continue to deteriorate, contributing to the worsening of overall public transport quality, while reform of the railway sector based on the Railway Law of 2007 remains unfinished.

Population growth, higher incomes, and a move toward the service and financial sectors inevitably lead to increased demand for a higher quality and quantity of transport. Combine this with stagnant public transport service facilities, and the results are predictable – both the share of public transport and average travel speed will decline.

Figure 3 tells a sobering story. In 2002, various public transport modes (bus and other) constituted 43.6 percent of mode share. If walking and bicycling are removed from the equation and only

motorised transport is considered, the share of public transport in 2002 was 57.14 percent, which is relatively high compared to international norms (Morichi et al, 2011). (Outliers include Hong Kong and Manila, where public transport has more than 70 percent of mode share.)

Using the historical data available on trends from 1985 to 2000, transportation specialists – including the Indonesia Transport Society (MTI) – would expect that, absent any intervention, the share of public transport in Jakarta would decrease by about 1 percent annually (Parikesit, 2008, 2010a, 2010b). Using such a "rule of thumb", the projected public transport share in 2010 would be 40–45 percent.

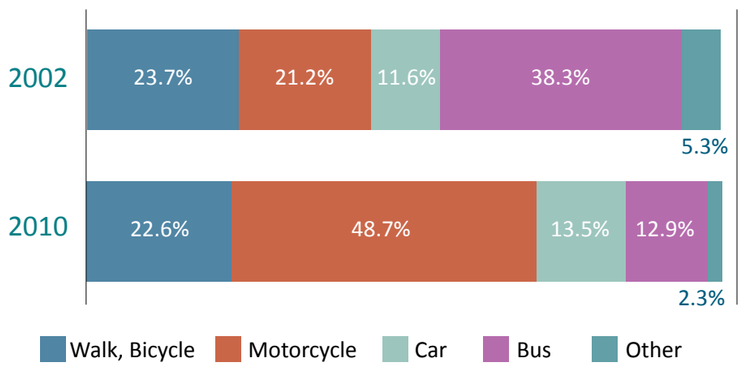
The actual figures are therefore surprising. In 2010, although the data are still preliminary, the JUTPI survey (Jabodetabek Urban Transport Policy Integration, a JICA-supported technical cooperation) found that the current public transport share is 15.2 percent, or 17.9 percent if only motorised transport is considered. That translates into an annual decline of over 3.1 percent. This is certainly a freefall. In the absence of alternatives, most travellers are now relying on motorcycles and some are using their cars to provide door-to-door transport services (Susilo et al, 2007; Parikesit, 2010c). Every year, motorcycle manufacturers report record sales.

The size of the share of public transport has significant implications for the nature of public policy to address urban mobility. For cities that already have a high level of public transport use, the challenge is simply to maintain it, ensuring that transport users do not switch to motorcycles or cars. For cities like Jakarta where public transport use is low – 30 percent or less – the task is far more difficult. Progressive political commitments and high levels of public investment are required to give private transport users an incentive to switch to public transport.

The Need for Political Commitment

When other emerging East Asian cities such as Seoul, Taipei, and Bangkok have been able to improve their use of public transport significantly, why have there not been similar developments in Jakarta? There are certainly many explanations for the advancement of those cities (Morichi et al, 2011). The availability of high quality technical data, information, and appropriate plans and technical designs are all factors. However, empirical studies have demonstrated that a strong political commitment translated into long term financial support and an effective coordination mechanism is crucial. Without it, progress will be hampered.

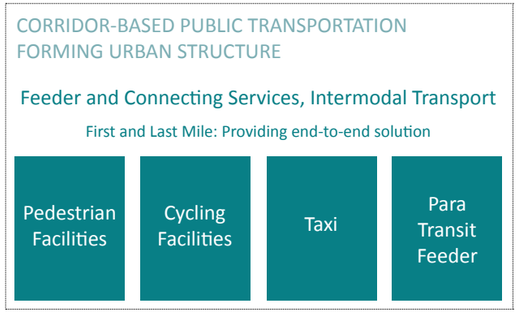
Figure 3: Mode Share for Greater Jakarta, 2002 and 2010



"Car" includes taxi and bajaj
"Other" includes railway and ojek
Sources: CMEA, 2011 taken from SITRAMP (2002) and preliminary figures of JUTPI Commuter Survey (2010)

Realising that the provincial government of Jakarta alone cannot resolve and alleviate congestion, the national government has taken an initial key step to address Jakarta's transportation issues. The Office of the Vice President, through UKP4 (the Presidential Working Unit for Supervision and Management of Development), has played a critical role in developing a conceptual framework and implementation strategies to devise a tool for horizontal, vertical, and diagonal coordination and integration of existing policies and plans. Principles underlying this effort are outlined and discussed in the next paragraphs.

Figure 4: Mobility Management Concept



(Source: MTI, 2010, adapted from Feng, 2010)

debates. By focusing on "what causes congestion?" or "how do we relieve congestion?", people can be sidetracked from the original goal of safe, efficient, and equitable travel.

As is demonstrated by the increasing number of urban mobility projects (Feng, 2010; Ishida, 2010), the global trend toward seamless travel requires a fresh outlook on the role of, and connections between, every aspect of transportation infrastructure and services. For example, promoting feeder buses requires that roads are well connected to form a network, and well maintained to ensure continuous services. Busways, Mass Rapid Transit (MRT), and Commuter Rail all require intermodal transfer (see Figure 4).

The government should also invest in "first and last mile" infrastructure such as pedestrian

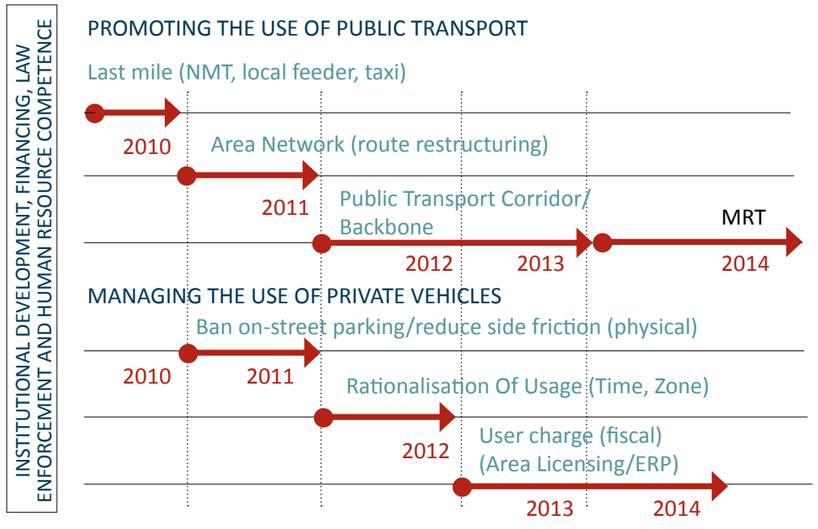
The future situation is almost unimaginable, given that today's average travel speed at peak times is 13–15kph.

The focus must change from "relieving congestion" to "urban mobility management". This will draw in more stakeholders and create synergy. Congestion is exacerbated when planners lack understanding of how urban transport works. Two or three decades ago, questions such as: *Buses or motorcycles? Roads or rail? Walking or bicycling?* framed the discussion, but these questions are less relevant today and can create unproductive

and cycling facilities, taxi stands nearby public transport shelters, and should allow some room for paratransit to ensure that public transport services are accessible for travellers. In fact, the government should start investing in the first and last mile projects before starting to allocate their public funds for other activities.

Appropriate timing and sequencing are essential. Many cities are successful simply because the steps they take are consistent. Singapore is perhaps the most extreme example of this consistency. Urban planning and urban transportation plans for Singapore were developed in the mid 1960s with the assistance of the UNDP. Since then, the Singapore government has implemented programmes and projects suggested by those plans in a well defined sequence. They follow a basic rule: Managing the use of private vehicles should come *after* the provision of public transport services has been established. Indonesia could use the same principles to draft a sequenced list of activities. Institutional and financial support, an appropriate financing schedule, consistent law enforcement, competent regulators, and capable operators should serve as a foundation for implementing plans and projects (see Figure 5).

Figure 5: Conceptual Implementation Framework With Appropriate Sequence and Timing



(Source: MTI, 2010)

Demonstration efforts with two corridors offer a foundation for further success. Demonstrating that an option is feasible is a good strategy for building stakeholder acceptance and enhancing the likelihood that future implementation will succeed. UKP4 has selected two corridors to challenge various stakeholders to work together and achieve an agreed travel time performance. Improvement along these corridors – Depok-Ragunan-Dukuh Atas and Serpong-Lebak Bulus-Dukuh Atas (see Figure 6) – requires coordination among three levels of government. It also calls for active involvement of the police department to monitor and alleviate local congestion along the showcase corridors. The demonstrations need to be completed in 2011 in order to demonstrate quick wins to the public. They can then be replicated in other corridors and will buttress government resolve in pursuing the overall objectives of the Transportation Master Plan.

Jakarta's traffic congestion reduces quality of life for residents. *Photo by Andre Susanto*

A cornerstone for success is the establishment of the Jabodetabek Transport Authority. One of the important milestones of the UKP4 implementation framework is the establishment of Jabodetabek Transport Authority. JUTPI is expected to provide a recommendation on the institutional set up of the Authority (CMEA, 2011). It will be a new institution, mitigating implementation risks by dealing on multiple levels with multiple agencies, multiple stake-holders, and multiple issues. Currently, risk is taken independently by various agencies, public and private, at different government levels, without a risk-sharing mechanism. By pooling fiscal and implementation risks, the authority will be able to mitigate risk, request national government budget support, and create a risk-based platform for prioritising implementation. With risk pooling and risk transfer mechanisms, an implementation framework can be designed as a single investment package, making it a cost-effective programme. The new authority will also allow stringent monitoring of activities and their impacts. It will most likely be created as a centrally managed Public Service Agency, or *Badan Layanan Umum*, but it can evolve into a for-profit company in the future. •

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REFERENCES:

Printed publications

CMEA, 2011, *Progress of Jabodetabek Urban Transportation Policy Integration Project*, CMEA, Jakarta.

Feng, Chen Ming, 2010, *Lessons of Green Transportation in Taipei: Transit and Bike Projects*, EASTS Seminar Proceedings, Sendai Japan.

Ishida, Haruo, 2010, *Transport Strategy for the Green Growth*, EASTS Seminar Proceedings, Sendai Japan.
Morichi, Shigeru, Surya Raj Acharya, Michelle Parumog, Danang Parikesit, Bambang Susantono, Primitivo Cal, Noriel Tiglao, Chen Min Feng, Yi John Sun, Hyun-gun Sung, Shinya Hanaoka, Haixiao Pan, Takashi Shoyama, Trinh Van Chinh, William Lam, 2011 (forthcoming), *Transport in East Asian Megacities, ITPS* – Japan.

MTI, 2010, *Strategy for the Greater Jakarta: Focus on Urban Mobility Management*, a position paper submitted to UKP4, MTI, Jakarta.

Parikesit, Danang, 2008, *Public Transport Options for East Asian Mega-Cities*, Jurnal Transportasi, Vol. 8, No. 1, June 2008, pp. 1 – 12

Parikesit, Danang, 2010a, *Financing Public Transport for Greater Jakarta: A Challenge for Sustainability*, EASTS Seminar Proceedings, Sendai Japan.

Parikesit, Danang, 2010b, *A Critical Review on the Establishment of Jabodetabek Transportation Authority*, a paper submitted for an FGD organised by CMEA, MTI, Jakarta.

Parikesit, Danang, 2010c, "Challenges in Providing Mass Transportation for Megapolitan Jakarta" (A Contributing Chapter in *City Development in Indonesia 2010: Managing Diversity and Disparity in a City Development*), Ministry of Public Works, Jakarta (forthcoming).

Resosudarmo, Budi, 2010, *Jakarta as the Center of Economic Growth*, Bappenas Seminar Proceeding, Jakarta.

Susilo, Yusak O., Tri Basuki Joewono, Wimpy Santosa, and Danang Parikesit, 2007, *A Reflection of Motorization and Public Transport in Jakarta Metropolitan Area*, Journal of International Association of Traffic and Safety Sciences, Vol 31, No. 1, 2007, pp. 59 – 68.

UKP4, 2010, *A Follow Up for Jabodetabek Transport Provisions*: 21 Steps, 91 Action Plans, 112 Sub-Action Plans, a report to the Vice President, UKP4, Jakarta.

Online publications

http://www.citymayors.com/statistics/expensive-cities-asia.html, accessed 1 February, 2011

Urban Mobility by the Numbers

1500 motorcycles; 500 automobiles
The number of motor vehicles being added to Jakarta's roads every day.

40%
The percent of time that cars in Jakarta are actually moving during their journeys.

24%
The average load factor for public transportation in Yogyakarta. Higher average figures correspond greater efficiency and reduced congestion.

60%
Contribution of the transport sector to carbon dioxide emissions in urban areas of Indonesia.

5
The number of Indonesian cities (besides Jakarta) that will suffer total gridlock sometime between 2015 and 2025 if no effective urban mobility policy is implemented. The cities are Bandung, Makassar, Medan, Surabaya, and Semarang.

320
Number of the 1642 buses impounded in Jakarta for traffic violations in 2010 that were not roadworthy, according to Jakarta's City Transportation Agency.

The Expert View

The Question: "Do you think it is possible to solve the traffic problem in Jakarta? What do you think policy makers should do to try to improve the situation?"

Prof. Dr. Ir. Sutanto Soehodho, M.Eng
Deputy Governor of Jakarta for Industry, Trade, and Transport

"In principle we should not lose hope. The congestion problem must be solved, though it requires time and funds. There are not only physical costs but also social and other costs. To solve the congestion problem, there are three major pillars that need to be improved, namely road infrastructure to complement the existing network system, public transport facilities and infrastructure, and transport demand management.

First, in regard to road infrastructure, Jakarta still has a very low road ratio of 6.3 percent [the road ratio is an index of road length compared to the roads required based on population and area]. This ratio is very low compared to the ideal number found in other big cities in the world such as Singapore, Tokyo, Paris or London, which have numbers exceeding 12 percent and even one over 24 percent. But enlarging roads is not an easy task. It may conflict with other concerns such as the city's spatial policy, particularly to provide more green, open areas – these should be around 30 percent of the space – and the increasingly limited availability of city space. In order to continue developing the road infrastructure network there is no other way to proceed except by building more elevated roads.

Second is public transport. A recent survey shows that more than 20 million trips are made in Jakarta every single day, and many people prefer to use private transport because public transport is lacking in terms of both quality and quantity. In this situation, the role of private operators and support from the central government are critical. For example, when the bus rapid transit system was encouraged to use more environmentally friendly liquid gas, this type of fuel was in short supply at highly fluctuating prices, so this transport system could not operate efficiently. Central government policies are key to successfully implementing a public transport programme such as bus rapid transit.

Third, because developing road infrastructure and public transportation requires substantial time and money, in the meantime we can implement a transport demand management system. For example, we can regulate school opening hours to help overcome congestion and ensure that the police discipline public transport vehicles that stop at any place along the road and impede traffic flow. Transport demand management can be carried out by implementing congestion pricing through so-called Electronic Road Pricing (ERP), and various other traffic measures such as limiting the use of motorcycles, etc.

All these measures have been formulated in a programme to overcome traffic congestion and develop a reliable city transport system in Jakarta named Pola Transportasi Makro [PTM, the Macro Transport Pattern] to be implemented through the three-pillar program, providing a short, medium, and long term solution.

Hence, there shall be no doubts in the implementation of PTM, whoever may be the Governor, because everything has been accommodated in regional regulations. The consistent and timely implementation of PTM will give hope to the people of Jakarta that their congestion problem may be resolved forthwith."

Ir. Adriansyah, MM
General Secretary of ORGANDA (Association of Land Transport Operators)

"Yes, I am convinced that Jakarta can be freed from the problem of congestion, as long as all parties have the same commitment to solving it. The problem is mostly caused by a growth of the vehicles that is not balanced with the availability of road infrastructure. The main solution to the problem is for decision-makers to revitalise public transport by providing facilities that are safe, comfortable, and affordable. This will give people now using private transportation a reason to switch. The government as the provider of infrastructure should strive to develop facilities and services for public transport. In addition, it is very important to involve the government in restricting cost by providing subsidies to providers of public transport vehicles and service operators or facilitating investment.

Last but not least, there must be synergy between public transport operators and the government as regulator. These three solutions have been implemented successfully in other countries. At present, the government has the will to strive for a good transport system, but it does not yet have maximum impact, because there is not coordination across sectors. For example, the congestion in Jakarta is related to the transport policies in Jakarta's outlying cities (Bogor, Depok, Tangerang, and Bekasi). Therefore coordinated policies need to be developed to handle the problem."

Urban Sanitation

July, 2011

KEY POINTS *on Improving Urban Wastewater Management*

Access to proper sanitation is low in Indonesian cities, especially in low income areas, and ensuring sanitary conditions in residential areas is a major challenge for government. Through an Indonesia Infrastructure Initiative activity, planning consultants are now working with eight cities that are preparing master plans and feasibility studies for successful wastewater management. To select the city governments that are readiest to develop master plans, mayors were asked to provide an explicit statement of commitment, particularly regarding willingness to provide sewerage, as this is a key sign that progress can be made.

The dynamics of each city are different and it is risky to generalise about success at an early stage. But key factors for success appear to include: city planners who can clearly communicate their analyses to decision-makers within government; mayors who are adept at steering their bureaucracies toward reform; and a city government that is responsive to community demands.

Because social cohesion is lower in large cities, governments may need to play a strong role to manage negative externalities. Planning work with larger cities therefore needs to emphasise government ownership of plans. Three basic challenges are mobilising stakeholders, bringing city and regional governments together, and identifying funding. These challenges can be met by first concentrating on an integrated sanitation improvement programme over the 20-year term of a master plan. Second, operating and permitting functions related to wastewater should be put placed within a single unit that should concentrate on "early wins".

Local level strategies should be supported by regional and national government. Provincial government can provide oversight, and the Government of Indonesia's (GoI) City Sanitation Development Acceleration Programme (PPSP) will help to ensure that the institutional environment in which cities develop and implement their programs is conducive to change.

The above reforms do not overcome the fundamental need for proper and sustainable funding. Service delivery organisations should operate on a "fully costed and fully funded" basis. Certain tax strategies can help, although there are political challenges.

Indonesian standards will need to be developed, primary data collected, and technical expertise utilised. Even more importantly, a rigorous approach to institutional analysis and capacity building needs to be taken.

GoI has in the last year demonstrated its resolve to improve wastewater management by allocating significant new funding to the sector. It is now up to the sector to respond.

Planning Improvements to Wastewater Management for Large Cities

Work with eight cities in Indonesia is demonstrating that stakeholder commitment, intergovernmental cooperation, and sustainable funding are all crucial elements in developing effective master plans.

Andrew McLernon

Seen through the lens of sanitation, Indonesian cities are not really pleasant places to live. Access to proper sanitation is low, especially in low income areas. The incidence of water-borne diseases is high, and enormous stress is placed on the aquatic environment by pollutants flowing into bodies of water. One study estimated that the Indonesian economy loses some USD 6 billion a year because of poor sanitation, and that does not include decreased productivity in other sectors (for example fishing and agriculture), income foregone from tourism, and general reductions in the quality of life.

Unpleasant foam from untreated domestic wastewater collects in the river at Muara Baru, Jakarta.
Photo by Rahmad Gunawan

About half of Indonesia's 240 million people live in urban areas. Providing services to this multitude of city dwellers is a major challenge for government – and no challenge is more daunting than ensuring sanitary conditions in residential areas. Domestic wastewater must be safely removed, both the "black water" from toilets and the less contaminated but larger in quantity "grey water" from bathrooms, kitchens and laundries.

Engaging government and communities in proper wastewater management is not an easy task. At the individual level, people can dump dirty water into a canal or let it seep into the ground. As the saying goes, "out of sight, out of mind." The problem seems to disappear, or at least to be transferred to someone else.

Rural areas have a reasonably good ability to organise services for dealing with wastewater, but in big cities it is a different story. Especially in developing countries, social cohesion is lower in urban areas. Newer communities find it hard to solve problems through collective action, and there may be a greater expectation that government will take responsibility. Unfortunately, city governments have typically not made wastewater management a priority – and even if they did, funding and expertise are often in short supply. The problem is not simply a technical one, but a more complex governance problem.

In the January 2010 edition of ***Prakarsa***, we described the preparation of an Indonesia Infrastructure Initiative (IndII) activity to assist regional governments prepare master and other plans for wastewater management in larger cities in Indonesia. Since then, the

Rural areas have a reasonably good ability to organise services for dealing with wastewater, but in big cities it is a different story.

Prakarsa Compendium

activity has been launched and it is now in full swing. At this writing, planning consultants are working with eight cities – Batam, Pekanbaru, Palembang, Bandar Lampung, Bogor, Cimahi, Surabaya and Makassar. These cities are now preparing master plans and feasibility studies for successful wastewater management. In this article, we share some insights into the city wastewater management planning process that have been gleaned and reinforced by work with these cities.

Choosing Committed Cities

Under Indonesia's decentralised system of government, national government funding provides an incentive to encourage city governments to develop wastewater management plans. The amount of central government funding available is small, so it is important to set priorities and work first with those localities that demonstrate the strongest commitment. The Directorate General of Human Settlements (DGHS) provided input to IndII to develop a process to identify the city governments that are readiest to develop master plans.

Mayors were asked to provide an explicit statement of commitment to three actions: to provide sewerage where demonstrably needed; to contribute to the costs of a comprehensive sanitation program; and to address underlying institutional problems. Cities also had to describe why they were applying for support, and respond to a questionnaire that probed their perceptions and motivations. These steps have proven to be useful tools in assessing the likelihood that a city government will follow through on initial commitments.

In particular, city willingness to provide sewerage is a key indicator of commitment to improvement, and a sign that progress can be made. Given the maturing state of Indonesia's larger cities, there is a lack of functional alternatives to sewerage for heavily developed areas. Further, developing sewerage forces cities to adopt better planning strategies. A sewerage operator can also act as a "champion" for all key wastewater management activities.

> Newer communities find it hard to solve problems through collective action, and there may be a greater expectation that government will take responsibility.

Inevitably, the dynamics of each city are different. Support for improving wastewater management might be strong at the top, but at lower levels it can vary depending upon a range of factors. These include how the existing city budget is allocated among agencies; the backgrounds of key decision-makers; the perceived benefits and costs of supporting the program; and the appeal of the incentives, such as central government funding, that are on offer.

While it is risky to generalise about success at an early stage, it seems that key factors for rapid progress are: city planners who can clearly communicate their analyses to decision-makers within government; mayors who are adept at steering their bureaucracies toward reform; and, most importantly, the responsiveness of the city government to a growing demand for services from the community.

A Large City Mindset

Many current efforts in developing countries to enhance wastewater management are modelled on past successes with small towns and rural areas. But a focus on large urban areas necessitates a different mindset if improvements are to be sustainable. As mentioned above, urban communities tend to have less social capital, and it may therefore be that these large areas require more institution-based rather than community-based solutions.

This is not to minimise the role of the community in demanding services, holding government accountable, organising collection solutions, and covering costs, but merely to acknowledge the differences between small and large communities. Urban communities are generally more willing and able to contribute to the cost of large investments made by government on their behalf. But where populations are large, governments may need to play a stronger role to manage negative externalities and provide the large-scale investments needed. Planning work with larger cities therefore needs to emphasise government ownership of plans, and strengthen the role of participating regional governments.

Social cohesion is usually lacking in vast cities like Jakarta, which makes organising the community to manage wastewater more difficult.
Courtesy of Bruce Briscoe

The Government of Indonesia's (GoI) decentralisation reforms and democratisation offer an excellent opportunity for progressive regional governments that are ready to take control of their own development and to respond to community demands.

Challenges and Strategies

Perhaps the three most fundamental challenges are mobilising stakeholders, bringing city and regional governments together, and identifying funding. *Mobilising stakeholders* who use sanitation services is essential because their expression of demand

A canal in Surabaya. The city is now creating a master plan so that it can better manage the disposal of wastewater.
Photo by Andre Susanto

and their participation in planning are needed to ensure that the infrastructure and services developed are the ones that the community needs. *Bringing governments together* is necessary because the scope of the problem is beyond what any one level or agency of government can tackle. For example, "embryo sewerage units" are a potential solution that cannot succeed without commitment and cooperation across agencies. The need to *identify large and sustainable funding sources* for the capital and operating expenditures that are needed for wastewater infrastructure is self-evident, and particularly difficult because city governments must also fund a whole range of other community services.

These challenges can be met through a variety of strategies. First, it is important to concentrate not only on the practical aspects of immediate infrastructure development but on an integrated sanitation improvement programme over the 20-year term of a master plan. The programme must include a set of interventions designed to address both the demand and supply sides. It should cover both physical infrastructure (for off-site treatment of waste and for communal systems) and social marketing. Perhaps most importantly, it must build the capacity of both city government (in the provision of wastewater services) and the community (in addressing sanitation problems through collective action). Such an integrated and comprehensive programme will ensure that support is elicited and maintained among key actors.

Second, to the greatest extent possible, operating and permitting functions related to wastewater should be put "under one roof". The creation of a single unit with broad responsibility for wastewater management will lead to more autonomous and accountable service delivery.

This unit should concentrate on "early wins" to demonstrate that sanitation problems are not intractable. As the Mayor of Palembang has said, his community won't support efforts if they don't see results. Quick successes encourage support from influential actors even if they were initially sceptical. Methods to achieve early wins include: implementing a programme of simple actionable interventions at the outset; putting extra resources into developing suitable technical and institutional solutions that are location specific; proceeding to feasibility studies immediately; and strengthening a range of wastewater management functions within the city government. Along with this, early attention to middle class needs as well as those of slum residents can help build a broader base of community support.

These local level strategies can find support at regional and national levels of government. The provincial government has a valuable role to play as "environmental policeman", and should strengthen efforts to offer oversight and incentives to city governments. This can be more effective and less problematic than leaving it to agencies within city government to police other city units.

Support for improving wastewater management might be strong at the top, but at lower levels it can vary.

Procedures and approaches that will need to be applied under GoI's PPSP programme (the four-year City Sanitation Development Acceleration Programme launched in 2010) will help to ensure that the institutional environment in which cities develop and implement their programs is

conducive to change. Hence wastewater planning consultants must work closely with the cross–functional Sanitation Working Groups established under PPSP that are preparing a cross-sectoral sanitation strategy in each city. These joint efforts will also strengthen efforts to build a national planning capacity, identify and implement national standards, and promote coordination with the Ministry of Public Works (MPW), DGHS (for technical aspects) and the Ministry of Home Affairs (MoHA; for institutional arrangements) in the development of city master plans.

Funding is Key

The above reforms do not overcome the fundamental problem of lack of funding. Early on, cities can seek substantial grant funding through MPW and MoHA. But this is only a first step. If the sanitation agency is to operate centralised sewerage systems and domestic septic sludge treatment facilities, provide technical and social facilitation to community systems, set and control sanitary standards in buildings and do likewise for the housing estates that are mushrooming around the city, then it needs proper and sustainable funding.

In this regard, quickly establishing the principle that the service delivery organisation should operate on a "fully costed and fully funded" basis is important. The recent enactment of Law no. 28/2009, which puts the power to set and collect property development and transfer taxes entirely under the authority of the city government, provides a golden opportunity for reform. The city government can identify "drainage districts" in areas where environmental services have been provided. A portion of the increase in revenues expected from the new tax law can be earmarked for environmental sanitation. Further, a portion of the tax on increasing land value in serviced areas can be captured to provide the stable funding that the sanitation operator needs, although the political challenges to implementing such schemes should not be underestimated.

Some Emerging Lessons

As work continues in various cities, some overall lessons are emerging about the concerns that lie ahead. One of the most important is the need to develop Indonesian standards.

At present, there are few Indonesian planning standards dedicated to the wastewater sector and nothing specific to master planning or feasibility studies. Standard setters must look to international experience as a start, and develop reliable national standards over time. Establishing these standards will not be easy, because high and variable urban population growth rates result in large uncertainties about future needs, and even the most basic standards related to hydraulic and pollution loadings have not been firmly established. In some cases, effluent discharge standards are lower than receiving water standards. Implementing rules related to environmental management systems under Law no. 32/2009 have not yet been issued. Thus, proposed standards will need to be frequently reviewed.

Obtaining and making use of necessary data at the city level poses just as much of a concern as standard setting – especially when "planning fatigue" among local officials is high. Pressure to produce "results" tends to dominate the equally important need for proper planning of the potentially large investment needed to produce those results. Primary data on existing health, environmental conditions, facilities and socioeconomic matters must be collected, analysed and presented in ways relevant to a range of stakeholders, and then used as a basis for reaching agreement on objectives and how to achieve them. Technical experts in the sanitation sector are needed to assist city officials in this effort, but such expertise is in short supply in Indonesia.

If standards, data and expertise related to technical matters are in short supply, the problem is even more severe in terms of the inputs needed to identify institutional obstacles and objectives, and to develop capacity building plans in response. In fact much of this work is "trial and error" at present, as setting institutional development objectives is not as straightforward as grappling with technical issues. Nevertheless, a rigorous approach to institutional analysis and capacity building needs to be taken to the greatest extent possible. Feasible strategies for change should be included in capacity development plans.

The need for improved wastewater management services in urban areas in Indonesia is colossal, and the challenges are daunting. But GoI has in the last year demonstrated its seriousness by allocating significant new funding to the sector. It is now up to the sector to respond – by working together to develop the most appropriate technical and institutional solutions – even if the wastewater sector is in its infancy. Well begun is half done. •

NOTE: *The opinions expressed are those of the author and not necessarily of IndII Management, AusAID or the Government of Indonesia.*

As the Mayor of Palembang has said, his community won't support efforts if they don't see results.

About the author:
Andrew McLernon is an urban development consultant based in Indonesia, who has worked mainly on World Bank and the Asian Development Bank funded projects advising the Government of Indonesia. He is now consulting with IndII to develop its wastewater programming. Andrew spent nearly 20 years of his professional career on the engineering design and supervision side of water supply, sanitation and urban infrastructure; but since going back to school in the mid 1990s he has been heavily involved with the policy, institutional development and capacity building side.

KEY POINTS *on Solid Waste Management Challenges*

Indonesia's inhabitants generate around 38.5 million tonnes of waste annually, and municipalities are not providing the level of services needed to dispose of it properly, much less implement reuse-reduce-recycle programs.

About 44 percent of the population does not receive municipal waste services. The waste they generate ends up buried underground, composted by individual households or communities, burnt in the open air, or dumped into rivers. Under municipal collection services, waste is collected in handcarts and brought to small transfer sites, usually open dumps. Most of this waste is taken by truck to nearby large dumps and landfill sites. Scavenging occurs at all points. Very modest amounts of composting or incineration are conducted. About 40 percent of the dumpsites conduct leachate monitoring, collection, and treatment, mainly through simple sand filtration technologies. The current dumpsites, which are rapidly running out of capacity, generate an estimated 900 tonnes of methane every year.

Since decentralisation in 1999, local governments have had substantial responsibility for planning and implementing policies and services at the local level. But solid waste management must vie with many competing priorities, and local government officials may not always understand the public health and environmental benefits of better services. Insufficient revenues generated by waste management activities are also part of the reason municipalities are not rising to the challenge, and the situation is further exacerbated by a lack of implementing regulations.

The Government of Indonesia has decided to develop regional sanitary landfills – equipped with lining, soil protection, groundwater monitoring and landfill gas processing – as an alternative to current waste dumping practices. Some of the regional sites will include anaerobic composting and landfill gas facilities to generate energy. Currently about 2 megawatts of energy are being generated from organic waste through anaerobic digestion techniques. The Government's target is to increase this figure to 26 megawatts per year in 2013.

The Ministry of Public Works has worked with KfW to identify five cities that will be the subject of detailed feasibility studies on clean development mechanisms, following which two sites will be selected for pilot projects that will focus on opportunities to upgrade solid waste management systems, recycling and composting, methane gas capture, waste to energy and certified emission reduction, and related environmental improvements.

Comprehensive and long term improvement in waste management requires a sound legal and institutional framework. Fortunately, many of the key elements of this framework are in place, through Waste Management Law no. 18/2008 and complementary policies. Further regulations are needed to spur local government action but the real challenge is developing successful models to follow, in particular examples of successful regional cooperation in waste management, and practical experience at developing the necessary mechanisms.

Meeting Indonesia's Solid Waste Challenge

Local Governments must rise to the challenge of managing Indonesia's solid waste. More work remains to be done, but a policy framework and promising initiatives are underway.

Jeroen Kool
J. Sinarko Wibowo
Ronald van de Kuilen

Plastics, paper, glass, metal, rubber, leather, and more – along with organic matter, which comprises over 60 percent of the total, these are the materials found in Indonesia's solid waste. It is estimated that around 38.5 million tonnes of waste are generated annually in Indonesia – and municipalities are not providing the level of services needed to dispose of it properly (much less implement effective reduce-reuse-recycle programming).

Health and environmental problems created by this waste are significant, but so are the opportunities. Promising efforts to address the problem are now at early stages, and much of the necessary legal framework for better solid waste management is already in place. In this article we offer an overview of the current situation with respect to Indonesia's solid waste, and where future efforts should focus.

A motorcyclist holds her nose while passing the Sawah Besar solid waste transfer site in Pasar Baru, central Jakarta. *Photo by Rahmad Gunawan*

Where Does It All Go?

There is no one story that describes what happens to all of Indonesia's waste. About 44 percent of the population does not receive municipal waste services. The waste they generate – about 16.7 million tonnes a year – is managed by communities. It ends up buried underground, composted by individual households or communities, burnt in the open air, or dumped into rivers.

The other 56 percent of the population receives municipal collection services. Waste is usually collected in handcarts and brought to small transfer sites, of which there are estimated to be about 59,000 throughout Indonesia. These are usually open dumps. Scavengers pick through the trash, and at some sites there are composting activities.

Most of the waste from these small transfer sites is taken by truck to nearby large dumps and landfill sites. An estimated 537 central dumpsites are in operation, primarily within city limits. Scavengers – an estimated 50,000 of them – continuously sort through material at these central dumps. Very modest amounts of composting or incineration are conducted. About 40 percent of the dumpsites conduct some sort of leachate monitoring, collection, and treatment, mainly through simple sand filtration technologies. (See accompanying box, "Snapshot of a Dumpsite".)

An Unhealthy Situation

The present situation poses a number of concerns. Obviously uncontrolled burning, burying, and river dumping are bad for humans and the environment. The rotting organic waste at transfer sites breeds flies and disease. Most dumpsites lack the lining needed to keep toxins from leaching into soil or groundwater.

Moreover, little is being done to collect landfill gasses being generated by the rotting waste. As a result, an estimated 900 tonnes of ð every year from solid waste dumpsites through Indonesia.

The current dumpsites are rapidly running out of capacity. An estimated 123 sites (around 23 percent) have reached their maximum storage capacity and urgently need to be closed and replaced. Another 200 dumpsites have an expected life span until 2015, and another 160 should be good until 2020. Only about 10 percent of the sites can remain in operation until 2021 or longer.

Why Aren't Municipalities Doing Better?

The national government has responsibility for the development of national strategies and regulation regarding solid waste management. However, since decentralisation in 1999, local governments have had substantial responsibility for planning and implementing policies and services at the

The Government of Indonesia has decided to develop regional sanitary landfills as an alternative to current waste dumping practices.

Snapshot of a Dumpsite

The dump site for the Jakarta-Bogor-Tangerang-Bekasi area is the Bantar Gebang landfill site. It has a total area of 108 ha, and it receives more than 2 million tonnes of waste per year. Due to limited space, the waste here is piled up very high without sufficient sanitary provisions, although a composting section has been in operation since 2004. It produces about 100,000 tonnes of compost per year. Part of the leachate from this site is collected and treated. The remaining lifetime of the Bantar Gebang Landfill may be until 2019.

local level. Why have they not better risen to the challenge? There are a number of reasons; solid waste management must vie with many competing priorities, and local government officials may not always understand the public health and environmental benefits of better services.

Exact figures are not available, but insufficient revenues generated by waste management activities are also a factor. It is estimated that Rp 1 to 1.1 trillion (about USD 1.3 million) is collected from household billings, but only half of this is directly from waste collection fees; about 27 percent is in combination with water bills and 23 percent in combination with electric bills. Before decentralisation, local governments received financing specifically allocated for waste management from the State budget, as well as some financial assistance from the Asian Development Bank, the International Bank for Reconstruction and Development, the Japan International Cooperation Agency, and the Japan Bank for International Cooperation. Nearly all central government funding received since decentralisation is not earmarked for a specific purpose, so localities have no longer been compelled to invest in waste management.

The situation is further exacerbated by a lack of implementing regulations. Guidance is needed on a range of topics from usage rights to manufacturer obligations to the forms that incentive/disincentive schemes may take, compensation for negative impacts, and regional cooperation on waste management.

Improvements on the Way

Although still in their early stages, promising initiatives are underway that will begin to address some of the problems. The Government of Indonesia has decided to develop regional sanitary landfills as an alternative to current waste dumping practices. The sanitary landfills will be equipped with lining, soil protection, groundwater monitoring and landfill gas processing. Some of the regional sites will include anaerobic composting and landfill gas facilities to generate energy, for instance the regional landfill at Ciangir that is now under consideration. These developments fit into the wider objectives of the national government to meet goals established under the Kyoto Protocol on Clean Development Mechanisms, and to increase non-petroleum energy sources.

These planned regional landfills will be managed by regional integrated waste processing organisations. Currently 18 regional sanitary landfills are under consideration or preparation. None are yet constructed and in operation, and different approaches exist with regard to construction and operation. For instance, the West Java Provincial Government has invited private parties to bid for Build-Operate-Transfer contracts for the construction of the Bogor and Bandung sanitary landfills. To date 34 companies have expressed interest.

In addition, the Government of Indonesia and the donor community recognise that considerable opportunities exist with regard to energy generation from organic waste. The Ministry of Energy and Mineral Resources estimated in 2008 that Indonesia has the potential to annually generate 50 gigawatts of energy from Indonesia's total biomass resources, including from organic waste. Currently about 2 megawatts are being generated from organic waste through anaerobic digestion techniques. The Government's target is to increase this figure to 26 megawatts per year in 2013.

Organisations such as KfW, the World Bank, and the Indonesia Climate Change Trust Fund are all eager to address the issue of climate change related emission reduction through mitigation of landfill gas emissions. The Ministry of Public Works has worked with KfW to identify five cities that will be the subject of detailed feasibility studies on clean development mechanisms, following which two sites will be selected for pilot projects. A second phase of the initiative will focus on opportunities to upgrade solid waste management systems, recycling and composting, methane gas capture, waste to energy and certified emission reduction, and related environmental improvements.

Receptacles in Bandung for separating organic and inorganic rubbish. *Photo by Andre Susanto*

The Supporting Framework

These initiatives are an encouraging start, but comprehensive and long term improvement in waste management requires a sound legal and institutional framework. Fortunately, many of the key elements of this framework are in place. The new Waste Management Law no. 18/2008 provides policies and guidance that, among other key principles, are designed to shift from traditional patterns of waste management toward patterns that reduce waste generation. Principles emphasised in the law include: shared responsibility and cooperative efforts among waste producers, levels of government, communities and the private sector; promoting the "3Rs" (reduce, reuse, recycle); using environmentally friendly technology; and implementing specific incentives

and disincentives for behaviours and practices related to waste generation and management.

The law establishes obligations, on the part of national and local governments, to issue regulations, establish waste reduction targets, prepare dump closure plans, and finance the implementation of waste management. Complementary policies such as Minister of Public Works Regulation no. 21/PRT/M/2006 also give guidance on waste management at the national and local level.

What Must Be Done Next?

On the whole, the policy framework is sound. However, Law 18 is considered weak in terms of accommodating regional waste regulations and promoting integrated waste management principles. As has been noted, further regulations are needed to spur local government action. This is not an insurmountable problem. The real challenge lies elsewhere: Indonesia needs successful models it can follow. In particular it needs examples of successful regional cooperation in waste management, and practical experience at developing the necessary mechanisms, for example *Badan Layanan Umum* (for more about BLUDs, see the accompanying article, "A Vision for Flexible Wastewater Services" on page 231). Local Governments need to understand that improving solid waste management services will better protect the environment and the health of citizens, and will increase the allure and attractiveness of the city as a whole. Indonesia can best overcome its solid waste management problems by working to establish a few early successes, and then transferring the lessons learned throughout the country. •

The Ministry of Energy and Mineral Resources estimated in 2008 that Indonesia has the potential to annually generate 50 gigawatts of energy from Indonesia's total biomass resources.

About the authors:

Jeroen Kool has worked as a project manager and strategic advisor on a large number of internationally financed projects in the water and environmental sectors. He specialises in solid waste management, water resources and river basin management, and has been involved in projects in Indonesia since 1996. He served as project manager of IndII's scoping study on solid waste management, and was previously responsible for the national solid waste strategy for Macedonia and similar projects in Asia, Europe and Africa. Jeroen has been a senior staff member of the Netherlands firm DHV B.V. since 1992, and has presented technical papers at conferences in Geneva, Jerusalem, Kyoto, Damascus, Montreal and The Hague. He has a degree in geophysics.

J. Sinarko Wibowo has a degree in sanitary engineering and specialises in urban solid waste and wastewater management. His experiences as a sanitary engineer have been enriched with experiences beyond his core discipline. He was the Team Leader for the consultant support provided to the Greater Bandung Waste Management Corporation from 2004 to 2005. While working for the Indonesia Sanitation Sector Development Program (ISSDP) from 2006 to 2010, he was actively involved in the development of a city-wide sanitation strategy (CSS) approach which is now being applied in 330 Indonesian cities. His intensive work with local governments has provided him with deep understanding of the issues, barriers and potential that they face. He was the main author of the manuals developed during the ISSDP that are used as guidance by the City Sanitation Working Group. He has been a senior staff member of PT Mitra Lingkungan Dutaconsult since 1993 and is responsible for the water supply and sanitation group in the company. He has presented papers on sanitation at several international conferences.

Ronald van de Kuilen has been a senior consultant with DHV B.V. since 1994 and has extensive project and management experience in the fields of urban infrastructure planning and infrastructure and public services development. A civil engineer by training, with specialisations in infrastructure and regional and urban planning, he has long term experience in South and Southeast Asia (including Sri Lanka, Thailand, Bangladesh, Indonesia and Laos). Since 1983 his professional career has spanned housing projects for the urban poor in Sri Lanka; medium term spatial and infrastructure investment planning for the Bangkok Metropolitan Region; and long term involvement in the development of urban infrastructure and urban services (water supply, sanitation, solid waste and drainage) in Indonesia through various urban development and environmental management projects.

A Vision for Flexible and Accountable Wastewater Services

So far *Badan Layanan Umum Daerah* organisational units have been implemented primarily for public hospitals, but this model may also be appropriate for the sanitation sector.

Made Bawayusa

What sort of characteristics do you think are important for an organisation that is providing essential services to your community? Whatever your answer is, chances are that the system you describe will have two important features: it will be *flexible* – able to respond quickly to problems so that they do not interfere with continued service delivery – and it will be *accountable*, providing the best service possible because there will be consequences for the organisation that are directly tied to the quality of its performance.

This article focuses on a particular organisational form called BLUD (*Badan Layanan Umum Daerah*, or Regional Public Service Delivery Body), which has strong potential to deliver wastewater services to Indonesian localities in a manner that is both flexible and accountable. BLUDs were recently introduced into the Indonesian public sector regulatory framework and many consider them well suited to providing municipal wastewater and solid waste services.

What is a BLUD?

Simply put, a BLUD is an independent unit that is limited to operating a clearly identified range of services, which allows its output to be readily measured. It retains the revenue it collects from cus-

KEY POINTS *on BLUDs for Sanitation Services*

A *Badan Layanan Umum Daerah* (BLUD) is a flexible and accountable independent unit often considered well suited to providing municipal wastewater and solid waste services. BLUDs operate a clearly identified and measurable range of services, retain the revenue they collect, and can control their own expenditures. They can employ non-civil service personnel and use performance incentives for staff. BLUDs usually receive subsidies from government as they do not cover all of their costs through fees for services.

So far, the vast majority of BLUDs established in Indonesia are local government-owned hospitals, in part due to the demand for better medical services and the fact that the BLUD model dovetails well with hospital operations. When it operates as a BLUD, the hospital does not have to deposit all its income into the government's general revenue fund and then rely on the uncertain annual government budgeting process. This is important, as supplies of medicine cannot wait until the next fiscal year. Further, hospitals generally already have functional accounting systems, employ non-civil service workers and find flexible procurement to be useful.

Many of the reasons that the BLUD model suits hospitals apply to sanitation operators. In particular, the ability to retain and use sales revenues is important to ensure continuity of services. Wastewater operators can repair pipes and pay for vehicle operation, even if the annual government budgeting process is delayed. Sanitation sector BLUDs can make direct purchase of supplies without following complicated procedures. Similarly, operators can hire and offer incentives to better trained professional staff from outside the civil service.

A sanitation BLUD would be funded through sales of services, a "drainage district" tax, performance-based subsidies and government budget. It would be able to receive grants from outside parties. It would not have an environmental policing function but it would be unequivocally responsible for as many operating functions as possible, including planning and operating sewerage and sludge treatment systems, providing oversight and support to communal systems, and enforcing sanitation regulations and standards.

To provide a supporting framework, mayors, bupati, Bappeda and the units of the Regional Secretaries Office need to set targets, allocate substantial capital budgets, authorise cost-recovery tariffs and insist on the BLUD delivering the promised services.

Possible drawbacks of the BLUD model include the risk that their flexibility will be abused. Further, there is the possibility the BLUD will become too autonomous and begin to act outside its mandate. Interference of the unit providing oversight is still a major risk for BLUDs, but this risk is reduced if the sale of services provides a significant proportion of the BLUD's income.

The provision of proper sanitation services starts with large infrastructure investment – such as for final disposal sites and treatment works – that have limited capacity for cost recovery. It may be that for the foreseeable future, until the BLUD can attract a higher level of funding, government departments will provide the heavy infrastructure while the BLUD operates it.

The provision of proper sanitation services starts with large infrastructure investment, as seen in this wastewater treatment plant in Solo. It may make sense at least initially for governments to pay for heavy infrastructure and for BLUDs to manage operations. *Credit: Courtesy of IndII*

tomers, giving it greater control over expenditures. It can employ personnel who are not in the civil service, permitting managers to hire and reward staff on the basis of performance. A BLUD is in charge of operations only and does not set policy. Although it operates along commercial lines, its revenues do not have to cover 100 percent of its costs, and it typically receives subsidies from government. (See the article "A Promising Concept for Local Service Delivery" on page 81 for a discussion of the role of BLUDs in financing infrastructure services).

As the description above suggests, despite the term "badan" in its name, a BLUD is not an agency as defined by Government Regulation (PP) no. 41/2005 on Local Government Apparatus. It is different to, for example, *Badan Perencanaan Pembangunan Daerah* (Bappeda, or local planning board). As long as it complies with relevant regulations, a BLUD is allowed to operate with greater flexibility and with certain exemptions from the rules applicable to the most common organisational form approved for service delivery, the *Dinas*. (Although a Public Works Dinas may be responsible for building wastewater collection and treatment systems, it does not automatically become eligible for BLUD status as it is also responsible for sector guidance functions, such as providing policy advice to the Mayor, ensuring compliance with environmental and health standards and even regulating private operators. A subunit under the Dinas that performs day-to-day operational functions may be awarded BLUD status.)

The BLUD regulatory framework is based on PP no. 23/2005 and State Ministerial Regulation (*Permendagri*) no. 61/2007 on financial management of regional public service delivery organisations. The latter regulation provides the basic rules that regional governments must comply with on BLUDs, although it is incomplete because it focuses on financial matters and not governance of the organisation.

So far, the vast majority of BLUDs that have been established are local government-owned hospitals. There is a central directive that all public hospitals be awarded BLUD status by the end of 2011, which can be attributed at least in part to the high demand for better medical services and the fact that the BLUD model dovetails well with hospital operations. Crucially, when it operates as a BLUD, the hospital does not have to deposit all income it earns into the government's general revenue fund within 24 hours of receipt and then be subject to the cumbersome and uncertain annual government budgeting process. This is widely seen as a very important advantage – everyone agrees their supply of medicine can't wait until the next fiscal year! Further, hospitals generally already have functional accounting systems and they are able to demonstrate financial accountability. Most hospitals already employ considerable numbers of non-civil service workers and find it advantageous to have greater flexibility in the recruitment and deployment of staff, as well as the procurement of goods and services. Perhaps most importantly, everyone agrees on the service that the hospital should provide.

BLUDs and the Sanitation Sector

Although the public has not demanded better services in the sanitation sector (where expectations are that both service quality and price will be low), in most respects the reasons that the BLUD model is suitable for hospitals apply equally well to sanitation operators. In recognition of the advantages, the Ministry of Public Works recommended the BLUD form for sanitation operators in two Ministerial Regulations (Permen PU no. 18/PRT/M/2007 and 16/PRT/M/2008).

In particular, the ability to retain and use sales revenues is very important to ensure continuity of services. For example, wastewater operators can repair pipes and pay for vehicle operation, even if the annual government budgeting process is delayed.

Because BLUDs can operate outside of public procurement rules, sanitation sector BLUDs can make direct purchase of supplies – such as chemicals, spare parts, specialised repairs and electricity – without having to follow complicated and time-consuming procedures. Similarly for the management of personnel; operators can use younger, better trained and motivated professional staff from outside the civil service, and incentivise them using schemes comparable to those used in the private sector.

Notably, Permendagri no. 61/2007 does not impose a legal obligation to make a profit. At present, the majority of local government entities operating sanitation services are *Perusahaan Daerah*, local government-owned enterprises that are obliged, at least on paper, to seek such a profit. This is an obligation that solid waste and wastewater operators will always struggle to meet and another argument in favour of the BLUD model.

The Role of a Sanitation BLUD

As a BLUD, the sanitation operator will be funded through sales of services, a "drainage district" tax in service areas, performance-based subsidies and government budget. The BLUD can receive grants from outside parties and can establish cooperation with government agencies, private entities, and community organisations. It would not have an environmental policing function but it would be unequivocally responsible for as many operating functions as possible, including:

1. Planning, programming, designing, funding and constructing new sewerage systems based on sectoral development plans and policies of others

2. Operating, maintaining, rehabilitating and expanding existing sewerage systems

3. Similar responsibilities to 1 and 2 above for sludge treatment, plus regulating standards for private operators of de-sludging services

4. Providing technical oversight and support of communal systems, mobilising communities and facilitating management

5. Enforcing sanitation regulations on issue of land-use permits for housing estates, which include setting technical standards catering for off-site disposal in the future

6. Developing standards and issuing building permits related to sanitary aspects of individual buildings, and conducting inspection/enforcement of these standards

7. Providing technical recommendations to agencies concerned with regional planning, water resources and development in regard to establishing standards that will ensure long term availability of the land and rights-of-way needed for sanitation infrastructure

8. Setting standards for and working with industrial waste management agencies.

Separating the operational role of the BLUD from the policy and oversight roles is a basic institutional development strategy that can strengthen and clarify an organisation's purposes, functions and responsibilities. At the same time, it takes much more than just "operations" to deliver good services. Core government entities such as mayors, bupati, Bappeda and the units of the Regional Secretaries Office obviously need to play an active part in clarifying policy and roles, delivering resources, providing incentives and maintaining flexibility in the administrative system. For sanitation services, core government needs to set targets, allocate substantial capital budgets, authorise cost-recovery tariffs and insist that the BLUD deliver the promised services – without interfering in operational matters.

Not Without Drawbacks

Although BLUDs are a sound core strategy, complementary strategies will be needed, as the BLUD mechanism does have possible drawbacks. It is important to understand that the BLUD is not a legally autonomous entity – its assets are owned fully by the regional government. It formally remains "controlled" by the Dinas, the Regional Secretariat, the mayor or bupati. This is where the disadvantages emerge. Unless steps are put in place to enforce the accountability that the BLUD model offers, there is a real risk that the granted flexibility will be abused by the BLUD managers, putting the regional government at risk.

Further, there is the possibility the BLUD will become too autonomous and begin to act outside its mandate. Worry that BLUDs will no longer comply with the policies of the "owners" may keep regional executives and councils from being willing to grant BLUD status. It may lead them to informally restrict the BLUD's flexibility or interfere inappropriately in its operation. Similarly, if trust is low between the parties, the BLUD managers will tend to hide performance information needed to demonstrate its increased accountability.

Overall, interference of the unit providing oversight is still a major risk for BLUDs, but at least the BLUD status provides a formal barrier against it. The BLUD form further reduces this risk to operational autonomy if the sale of services provides a significant proportion of the BLUD's income.

What the Future May Hold

There are not yet many examples in Indonesia of the application of BLUDs to sanitation services. The reasons probably relate to concerns over excessive flexibility, the view that candidate organisations must first generate significant sales revenue, and the fact that the form is not widely promoted by central government. The Ministry of Public Works has no direct access to local governments with regard to organisational/institutional development at the district level, and the Ministry of Home Affairs is focused on meeting the goal of transforming all public hospitals into BLUDs.

In the public works and transport sectors, there are a few examples of BLUD operating water supply systems and transport services. Throughout Indonesia only one BLUD for wastewater management has been established (in Bali), but it was done before Permendagri no. 61/2007 was issued, leaving its precise status somewhat uncertain.

Looking into the future, one of the key questions on the applicability of BLUDs to sanitation and other infrastructure services concerns financing. In theory, the BLUD is a good option for all service delivery organisations, because of the inherent flexibility and accountability. But the provision of proper sanitation services starts with large infrastructure investment – such as for final disposal sites and treatment works – that have limited capacity for cost recovery. It may be that for the foreseeable future the Dinas will provide the heavy infrastructure while the BLUD operates it. In time the government and BLUD will develop the required planning, accounting and management systems; the legal framework to ensure full payment for services; and sound governance arrangements. At this point, the BLUD should be able to attract the levels of funding that are needed to provide excellent wastewater and solid waste services. •

About the author:

Made Bawayusa (MBY) is a member of the team supervising IndII's Wastewater Investment Master Plan projects in eight Indonesian cities. Much of his experience is with the Brantas River Basin Development Agency (BRBDA) in East Java, in the areas of financial and general management. During his tenure, BRBDA developed a series of dams within the river basin with the primary purposes of flood control, supply of irrigation and raw water for industries, and water-based electric power generation. BRBDA, which had 3000 to 11,000 employees from 1970 to 1989, served as a training ground for technical and managerial development for (as it was then called) the Ministry of Public Works and Electricity, and made innovations in its management system such as: adoption and implementation of Management By Objectives and Public Private Partnerships; and establishment of state-owned corporations, all initially deploying the trained and experienced staff of BRBDA.

MBY graduated from Brawijaya University in Malang in 1982, and obtained a Master's degree in Management in 1989 from the Asian Institute of Management in the Philippines. He also pursued doctoral studies in Business Administration at the University of the Philippines. Since 1991 he has been continuously involved as a freelance consultant in management, dealing mostly with government agencies focused on programs involving performance improvement, including public service delivery. Agencies supporting the programs include USAID, World Bank, CIDA and AusAID.

KEY POINTS *on Output-Based Grants for Sanitation*

It has been expected that the same methodology used in the successful output-based "Water Hibah" would be applied to enhancing sewerage infrastructure under the Government of Indonesia's (GoI) Water and Sanitation Initiative (WSI). But despite the proven potential of an output-based grant program, there is no "one size fits all" solution.

The Water Hibah design promotes equity investment by Local Governments (LGs) in their water companies by offering grants based on verified new water connections. The Indonesia Infrastructure Initiative designed the Sanitation Hibah along the same lines but on a smaller scale – aimed at reaching 10,000 households rather than the 70,000 that the Water Hibah had as a goal.

Complications arose quickly. Over 300 LGs have water companies, but only 11 operate sewer systems, either through their local water companies, through a separate sewerage company, or directly by LG departments.

Another complication is the relative absence of technical skills and know-how for sewerage, compared to water supply. The Government's requirement that the Sanitation Hibah had to go exclusively to poor households also caused problems. As a technical matter, connecting households to water is simpler and cheaper than connecting them to a sewerage system. Poor households in particular may be unwilling to bear any of the expense, as they do not see as much of a tangible benefit as they might with connecting to a water supply.

Three solutions are being used to address the requirement that the Sanitation Hibah go exclusively to low income households. First, giving the sewer authority flexibility in determining the price for the connection. Second, allowing localities to invest in a lower level, less expensive sewerage service (connecting households to a shallow sewer system that drains to a neighbourhood treatment facility or communal septic tank) that allows for later connection to the main sewer system. Third, utilising a public information campaign to explain the benefits of connecting to the sewerage system. A consultant is addressing technical difficulties and capacity deficiencies by providing support in new infrastructure development, improving operating and management, and socialising the benefits of connecting the sewer system to households.

Of the planned 10,000 connections, 3000 were expected to be neighbourhood sewer schemes, but no neighbourhood schemes have been proposed yet.

Some aspects of the Sanitation Hibah need review. The requirement that LGs invest equity in a sewer limits the pool of cities to those with a separate LG company as a sewer authority. A possible improvement is to make the equity investment optional. The other initiative would be to provide more sewerage infrastructure grants under an Infrastructure Enhancement Grant format, which would mean that all 491 LGs would be eligible. Another option, not output-based, is large-scale grant financing for new capital works with counterpart funding from the LG.

Adapting Output-Based Grants to Sanitation

Output-based grant mechanisms have proven potential, but what works for water may need to be adapted to the different constraints of the sanitation sector.

Rina Agustin
Rita Herlina
Jim Coucouvinis

The output-based grant mechanism known as the "Water Hibah" programme is experiencing much success in Indonesia. From the start, there was an expectation that the same methodology and tools would be applied to enhancing sanitation infrastructure under the Government of Indonesia's (GoI) Water and Sanitation Initiative (WSI). Our experience in applying the Hibah to sanitation illustrates that despite the proven potential of an output-based grant program, there is no "one size fits all" solution even for infrastructure development goals that fall within the same broad category.

To explain this, some background on the rationale behind the Water Hibah is in order. The Water Hibah came about from a convergence of policies on decentralisation. Soon after decentralisation and fiscal autonomy legislation was enacted, GoI noticed some important concerns: First, the laws provided for grants to be made to local governments (LGs) but there was no workable mechanism to do

A marsh scene from north Banjarmasin displays the estuarine terrain that creates a huge technical challenge for the development and maintenance of a sewerage system. *Courtesy of Purwedi Kurniawan*

this. Second, LGs quickly accumulated large cash reserves (*Sisa Lebih Perhitungan Anggaran*) that they were not spending. These budget surpluses amounted to some Rp 90 trillion, or more than USD 10 billion in 2007; more than enough to pay for the full backlog of water supply infrastructure.

Water sector professionals noticed a reduction of funds going to the sector because there was no viable on-granting mechanism by which central government could distribute grant funds to local governments and their local water companies (PDAMs). Equally disturbing to government was the virtual absence of equity investment by LGs in their PDAMs. This was in marked contrast to a very small number of LGs that provided substantial equity investment to PDAMs which in turn demonstrated dramatic improvements in public service delivery. The WASAP (I) report on Indonesia Water and Sanitation Finance Initiative prepared by the advisory firm Castalia for the World Bank noted successful LG/PDAM collaboration in Palembang, Banjarmasin, Bogor City, and Malang; the study also identified an output-based mechanism as an efficient option for grants to the water sector.

For these reasons, the Government adopted a policy of offering outcome-based incentives to sub-national governments for improved water supply (one of the triggers for the release of the USD 300 million second tranche of the World Bank's Infrastructure Development Policy Loan, or IDPL). The Ministry of Finance (MoF) then released decree PMK no. 168/169 of 2008, establishing procedures for on-granting.

We adopted this decree as the basis for the Water Hibah and decided that it would be output-based as required by the IDPL policy trigger and as recommended by the World Bank study. The Water Hibah design therefore responds to the need for equity investment from LGs to the PDAMs and the need to incorporate an output-based concept. To claim the Water Hibah grant, LGs must invest the same or a greater amount of equity in their PDAMs.

What about sanitation? When the Indonesia Infrastructure Initiative (IndII) first proposed a Sanitation Hibah, work being done under the WSI was dominated by the Water Hibah. The sanitation component was limited to the preparation of wastewater master plans for four cities (later increased to eight) and sanitation funded under Pamsimas[1] but it was acknowledged that more efforts were needed. GoI representatives strongly advocated for more sanitation content, in support of emerging government policy for increased investment in sanitation.

IndII responded by designing the Sanitation Hibah along the lines of the output-based Water Hibah but on a smaller scale – aimed at reaching 10,000 households rather than the 70,000 that the Water Hibah had as a goal.

Complications

Complications started to emerge almost immediately. We knew from the start that the most significant constraint was the relative lack of sewerage systems operated by LGs. There are only 11: Jakarta, Medan, Cirebon, Bandung, Tangerang, Yogyakarta, Surakarta, Balikpapan, Banjarmasin, Samarinda, and Denpasar.

Seven of these sanitation systems are operated through PDAMs, generally through a separate sanitation or sewer division. Bandung, Medan, and Surakarta are the most successful examples of this model, which is also followed by Cirebon,

Tangerang, Samarinda and Balikpapan. There are also two dedicated LG sewerage companies (PDALs) – one in Jakarta and one in Banjarmasin.

The last two sewer systems, in Yogyakarta and Denpasar, are operated directly by LG departments. These two LGs could therefore not qualify for the Sanitation Hibah, as the Hibah model requires that the LG make an equity investment into a separate LG company, not merely an LG department.

Another complication was the relative absence of technical skills and know-how in the sanitation sector, particularly sewerage. This is almost entirely due to the lack of infrastructure. In water supply there are over 300 PDAMs operating extensive water production and distribution facilities. Over time this demand for operators and engineers has produced a solid base of water sector skills.

Not so for sanitation and sewerage. We saw this lack of skills manifest in poor construction of infrastructure as well as inadequate operation. A particularly vivid example of this is offered by Banjarmasin. The site conditions there – low lying flat estuarine terrain with high groundwater – would be difficult for experienced sewerage authorities and contractors to manage, let alone the fledgling PDAL. Poor construction and high groundwater contributed to high infiltration rates which meant that pumping stations were not only pumping sewerage but also groundwater that was leaking through faults in the sewer system. The treatment plants also had to cope with higher hydraulic loads and dilute sewage, which is harder to treat. The flat terrain in Banjarmasin meant that up to 11 pumping stations were needed to get the sewage to the treatment plant. This configuration was an operations and maintenance headache.

Why Is Sewerage More Expensive Than Water Supply?

There are many reasons. Sewers flow by gravity so they have to be straight, laid at a specified constant slope, and have manholes at every change of direction or every 150m. This makes sewers more expensive to build. Water pipes can snake around. They don't have to be laid on a precise gradient. Because sewers use gravity, sewage has to be continually pumped up to gravitate down again. This requires frequent spacing of pumping stations. To minimise the number of pumping stations, sewers are built to greater depths, which is again more expensive. There has to be a trade-off between the cost of pumping stations, difficulty of trench excavation, and cost of deep manholes. Sewer pipes have to be bigger than water pipes for the same flow. First, they have to be bigger because they are sized to take the peak wet weather flow which is more than the peak daily flow used for water supply. Second, the flow velocity in sewers is slower than water supply, again because of gravity.

What about treatment? Sewerage is also more expensive in this regard. Treatment of sewage involves more processes, is more complicated, and produces sludge that also needs treatment. Sewage almost always needs full treatment whereas some water sources may be relatively clean and need less treatment.

In Surakarta the terrain and ground conditions were more favourable, allowing the sewer system to operate entirely under gravity. However, the sewer division of the PDAM had a poor understanding of operations requirements. The result was high infiltration and incorrect operation of the treatment plant.

Constraints

The Government's requirement that the Sanitation Hibah had to go exclusively to poor households posed a significant constraint. In the Water Hibah, the PDAM provides a connection and a tap at the property boundary. The householder is immediately able to use the water, even if only by bucket. Most people soon connect a plastic hose to the house. In time, pipes are built that reach into the bathroom and kitchen.

With sewerage, it is not so simple or cheap. A drainage pipe has to be built from the toilet to the sewer inlet. This pipe usually collects waste from the kitchen as well. These drains have to be built underground. The bathrooms and kitchens are usually at the back of the house. Installing connections under the house or around the building are difficult and expensive. Some houses don't have toilets so these have to be built. These requirements add up to a significant adverse impact on the willingness of households to connect to sewerage. This is even more so for poor households, who don't see as much of a tangible benefit as they might with connecting to a water supply.

We also had doubts that the PDAMs/PDALs and local contractors, especially in Banjarmasin, could complete what is a relatively large expansion with their limited capability and in the face of technically difficult site conditions.

Solutions

The approach we took to the problem of connecting poor households had three elements. First, we set the grant size to give the sewer authority flexibility in determining the price for the connection. The sanitation grant was set at a flat rate of Rp 5 million per connection to reflect the relatively higher cost of building sewerage infrastructure and the need for customer discounts for the connection.

Second, we provided for smaller scale sewerage service localised at the neighbourhood level. This service connects households to a shallow sewer system which drains to a neighbourhood treatment facility such as an Imhoff tank or communal septic tank. This is a less expensive investment so the grant per connection was reduced to Rp 2 million. However, this type of system allows the connection to the main sewer system when it finally expands to that area, and the decommissioning of the localised treatment.

Third, we utilised a public information campaign to explain to the community the benefits of connecting to the sewerage system, thereby stimulating greater interest in making connections.

To address the technical difficulties and capacity deficiencies, we engaged consultants to conduct intensive technical appraisal of the systems and capacity assessment surveys to define the scope of the programme. The consultants surveyed the priority systems of Banjarmasin and Surakarta. The findings of these surveys were used to define the scope of work for a capacity-building consultant. This consultant's role includes supporting the construction of new infrastructure under the Hibah, improving the operation and management of the sewerage authority, and socialising the benefits of connecting the sewer system to households.

The most significant constraint was the relative lack of sanitation systems operated by Local Governments.

Implementation

IndII worked in close cooperation with the Directorate General of Human Settlements (DGHS), MoF, and Bappenas to finalise the Sanitation Hibah design. The tasks of completing the on-granting agreements and the Implementation Manual proved fairly straightforward since the output-based format of the Water Hibah provided a suitable model. DGHS was also able to copy the structure of the implementation organisation established under the Water Hibah.

The same baseline and verification consultants were used for both the Water and Sanitation Hibah. However, implementation of the Sanitation Hibah has proved more difficult. Of the planned 10,000 connections, 3000 were expected to be neighbourhood sewer schemes, but no neighbourhood schemes have been proposed yet. Of the 7000 sewer connections, 3200 have been installed. Uptake of connections in Banjarmasin has been difficult even with an offer of a free connection and a six month free-of-charge period from the PDAL.

There has been no difficulty in getting the LG to invest equity in the sewer authority. The initial programme included three cities, Banjarmasin, Surakarta and Balikpapan. Later they were joined by sewer authorities in Jakarta and Bandung.

Where to From Here?

There are some things that we need to re-think. The first is the requirement to invest equity in the sewer authority. This is still a sound principle, but it constrains which cities can be chosen because it limits the pool of cities to those with a separate LG company as a sewer authority. A possible improvement is to make the equity investment optional. There would still be a requirement for LG investment, but this could be made through a direct budget expenditure on sewerage. We may provide a differential grant – more for those LG that invest equity compared to those that provide budget expenditure.

The other initiative would be to provide more sewerage infrastructure grants under an Infrastructure Enhancement Grant format, as described in “Results-Based Financing for Better Sanitation Services” on page 245. Such an approach would mean that all 491 LGs would be eligible.

We have also examined the option of large-scale grant financing for new capital works. This would not be output-based, but rather mainstream grant financing of new sewerage development in one city, with counterpart funding from the LG.

Once more cities implement master plans, progress will be easier. It will be possible to better programme new small neighbourhood schemes, and to support the new and existing schemes under the present format of the Sanitation Hibah. Ultimately our goal is to support the government’s policy for accelerating the development of sanitation services, and meeting the Millennium Development Goals for Indonesia. •

NOTES

1. Pamsimas is a GoI-World Bank programme that concentrates on village water supply and sanitation development and is currently being implemented in 4,000 villages.

About the authors:

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Jim Coucouvinis is the Technical Director for Water and Sanitation at IndII. He has been an independent consultant since 2004, working with the World Bank and AusAID on water and wastewater sector programmes. Previously, he was Vice President at Louis Berger Group for water and environmental services in SE Asia and China, and Resident Manager of Montgomery Watson Indonesia. Before working overseas, he worked for the Canberra Water and Power Authority in the design and construction of major water supply and sewerage works; and with the Australian Murray-Darling Basin Commission on the management of water resources and water quality in the Murray-Darling system and reservoirs. Jim holds a Master of Engineering from the University of New South Wales, and Science and Engineering degrees from the University of Queensland.

Rina Agustin is Sub-director for Technical Planning at the Directorate of Environmental Sanitation Development within the Directorate General of Human Settlements. She is a sanitary engineer who has been working at the Ministry of Public Works in the field of water and sanitation for more than 25 years. Most of her efforts have dealt with the development of new programs, including preparing concept designs and financing. She was one of the main contributors to the Jakarta Urban Development Project (1992–1994); the Public Private Partnership concept for water and sanitation (1994–2010); the Jabotabek urban development programme (2000–2003); community-based water supply and sanitation for low income communities (2006–2008); and the Water and Sanitation Hibah programme (2009–2010). She is a graduate of Institut Teknologi Bandung and has a Master in Urban and Regional Planning from Sydney University.

KEY POINTS *on Infrastructure Enhancement Grants*

Indonesia's cities have fallen behind in devoting resources to the management of wastewater and solid waste, but the Government of Indonesia (GoI) has established a framework to spur local governments (LGs) to invest more heavily. Within that framework, sanitation Infrastructure Enhancement Grants (IEGs) aim to leverage the level of investment by local government in infrastructure and reward those local governments that invest more of their total budget on sanitation.

To support decentralised interventions, GoI has established the centrally coordinated *Percepatan Pembangunan Sanitasi Permukiman* (PPSP), the policy for the acceleration of urban sanitation development. Under PPSP the 330 participating cities should develop City Sanitation Strategies that map their needs and development trajectories. PPSP funding for the programme comes primarily from LGs, which can also mobilise central and external funding.

The Indonesia Infrastructure Initiative is supporting local government sanitation programs in 22 cities through IEGs. To participate, LGs must show a record of commitment to sanitation improvement. The grants, which are required to be spent on fixed infrastructure, reward those local governments that invest proportionately more of their total budget on sanitation. Depending on their fiscal capacity, local governments must contribute counterpart funds equal to 30 to 50 percent of the value of the grant. Grant funding is reduced for poor performance.

Unlike some other performance-based grant mechanisms (such as the Water Hibah, which is paid after the installation of new water connections is confirmed) the IEG is paid before it is used. This does present a risk but it is being managed through proper oversight. If funds are expended outside the parameters of the grant, the expense of the non-conforming works will be deemed an "ineligible expenditure" and would have to be reallocated or returned.

The sanitation IEG programme has received enthusiastic support within GoI and local governments, based on its flexibility and the responsibility and control it gives to LGs. So far, IEGs have been applied to two of the three basic components of sanitation, wastewater and solid waste. As the applicability of this mechanism is further tested, IEGs will also address drainage.

Results-Based Financing for Better Sanitation Services

Infrastructure Enhancement Grants are specifically designed to reward Local Governments for making investments in sanitation infrastructure.

Nugroho Tri Utomo
Jim Coucouvinis

The waste generated by millions of urban households is not a pretty topic. Thinking about what happens to discarded banana peels, tin cans, cellophane, and plastic wrappers is unappetising enough; contemplating what happens when everyone goes to the toilet is something most of us would rather not do. Nonetheless, cities the world over must provide the proper infrastructure and services to cope with these wastes properly; health and quality of life are at stake.

Indonesia's cities have fallen behind in devoting resources to this task, but the Government of Indonesia (GoI) has established a framework

Children sort through uncollected rubbish in Pluit, North Jakarta. *Photo by Rahmad Gunawan*

Recycling of rubbish in Indonesia is largely informal, but is well developed, as this handbag made from Marlboro cartons shows. *Courtesy of Siim Teller*

that makes it possible to spur Local Governments (LGs) to invest more heavily. In this article, we will describe an innovative programme that is giving LGs incentives that will motivate them to enhance their sanitation infrastructure.

Urban Solid Waste

So, what does happen with household wastes in Indonesia? (For more on this topic, see “Meeting Indonesia’s Solid Waste Challenge” on page 223.) The collection of household rubbish is historically considered part of the obligation of the local neighbourhood administration (the RT or the RW). GoI regulations allow the RT/RW to collect fees from residents that cover the costs of collecting rubbish, transporting it to the disposal site, and dealing with the final disposal. The RT/RW is directly responsible for collection and is required to remit the transport and final disposal fees to their LG, but in practice – with 200 or more RT/RWs in a typical municipality to monitor – the LG collects little revenue for transport and final disposal.

Sorting and recycling of municipal waste is largely informal but is well developed. Waste pickers sort through household waste receptacles for paper, plastic, metal, and glass. The waste pickers sell the selected waste to waste consolidators. Waste consolidators in turn sell to waste landlords, who in turn sell to end users of the product, e.g. pulp mills and manufacturing plants. Uncontrolled picking is also carried out at the final disposal site.

The impact of waste picking has not been widely studied. There is fairly good information on the characteristics of the waste produced by households but less data is available on the composition of waste arriving at the disposal site. We don’t know how much and what is intercepted by waste pickers along the way.

Urban Wastewater

What happens when people go to the toilet depends a lot on economic status. At the most critical end of the scale are poor families living in either temporary or informal shelters in confined locations and in cramped conditions. These shelters are typically one room with a place to cook, and with no water. For these people, going to the toilet means going outside, typically to a drain or any other convenient location.

Further up the scale are more established urban slums (*kampung*) where dwellings may have a bathroom and toilet. The most densely populated such kampung have no space for a septic tank or pit latrine. The toilets flush directly to the drain. Except for the fact that it offers more privacy, this scenario is no different from open defecation.

For those citizens rich enough to have access to improved sanitation facilities, the picture is much better but still far from ideal, as their waste goes to septic tanks. Septic tanks in Indonesia are constructed as porous structures where the liquid wastes go directly to groundwater and sludge slowly accumulates at the bottom. Typically these structures are close to groundwater wells in densely populated areas.

At present, figures from different sources vary in their characterisation of the level of safe sanitation coverage. A figure of 18 percent of the urban population practicing open defecation is reliably reported. Recent surveys in six cities in the Indonesia

Sanitation Sector Development Programme found that only 40 percent of the population had access to safe disposal of human waste.

The Role of Government

Indonesia has 11 cities with sewer systems, all of which were built by the central government with external funds. Since the establishment of decentralisation and local government autonomy, local governments have assumed full responsibility for sanitation. The municipal government is required to provide a service for the safe disposal of septic tank waste and provide public facilities for those without access to such.

However, LGs have not maintained pre-decentralisation levels of investment in public sanitation facilities. Most LGs rarely if ever use any funds from their general allocation grant money (*dana alokasi umum*) for sanitation, even though these funds comprise 93 percent of their allocations from the central government. LGs only expend funds from the special allocation grant (DAK, or *dana alokasi khusus*) on sanitation facilities. More importantly, there has been very little new investment in sewerage by local government, possibly because it is seen either as too expensive or unnecessary.

GoI recognises that sustainable development can only come through decentralised interventions by accountable LGs. To support this, it has established the PPSP (*Percepatan Pembangunan Sanitasi Permukiman*, the policy for the acceleration of urban sanitation development). PPSP is a centrally coordinated development programme implemented through LGs (see PPSP policy targets in the accompanying box.) A key starting point is the preparation of the City Sanitation Strategy (CSS) which maps the needs and development trajectories for each of 330 cities in the programme. Funding for the programme comes primarily from local government; however the programme also provides a framework for mobilising and channelling central and external funding.

Building on the PPSP

As part of the Australian Government's Infrastructure for Growth Initiative, the Indonesia Infrastructure Initiative (IndII) is supporting local government sanitation programs in 22 cities through Infrastructure Enhancement Grants (IEGs). The design of the sanitation IEG programme uses the GoI on-granting mechanism under Government Regulation no. 57/2005 and Ministry of Finance (MoF) Decrees no. 168 and 169/2008. IndII began the design process late in 2009 in collaboration with GoI agencies, notably the Directorate General of Human Settlements (DGHS), the Directorate General of Fiscal Balance at MoF, and Bappenas. The agreed-to goal was to develop a results-based design and link the results-based criteria to the performance of each local government's FY 2010 sanitation programme.

PPSP Policy Targets

Elimination of Open Defecation by 2014

- By increased sewerage coverage to 5 percent of urban population in a minimum of 16 cities (includes five cities with new sewer systems);
- By implementing on-site public sanitation facilities in 226 selected priority cities.

Reduce waste generation by 20 percent

- By improving waste management services in 240 priority cities.

The objective of the Sanitation IEG programme is to enable institutional change at the local government level that will result in improved delivery of sanitation services. Because low investment, especially in new infrastructure, is a key problem, the IEG programme aims to leverage the level of investment by local government in infrastructure and reward those LGs that invest more of their total budget on sanitation. This is accomplished through several strategies:

A record of commitment to sanitation improvement is required for participation. Only LGs that are successfully carrying out activities mandated by the PPSP are eligible for an IEG. For the first group of grantees selected, the LG must have developed its CSS, have been in the process of preparing a CSS in FY 2010, or had a Medium Term Investment Programme for sanitation approved by DGHS.

The grants reward those LGs that invest proportionately more of their total budget on sanitation. The award of the grant takes into account both the total level of expenditure on sanitation by a local government as well as the relative size of the sanitation expenditure compared to the government's annual budget. Those LGs that spent proportionately more on sanitation services in FY 2010 are rewarded with a higher grant than those that spent proportionately less, all other things being equal. Thus, the greater the amount that the LG is willing to spend, the greater the amount of funding it can receive.

LGs are required to spend the grant on fixed infrastructure. The grant cannot be used to buy equipment, vehicles, or pay salaries and operating costs.

Depending on their fiscal capacity, LGs must contribute counterpart funds equal to 30–50 percent of the value of the grant. Fiscally weak LGs pay 30 percent, moderate ones pay 40, and strong ones pay 50 percent. The LG's funds can be used for equipment, supplies, and operating costs.

Grant funding is reduced for poor performance. The grant is subject to adjustment after the LG's delivery of the FY2010 programme and the implementation of their FY 2011 programme is reviewed. Poor performance in delivery of the programs reduces the grants. However the LG is still required to implement the full FY 2011 programme budgeted under the grant. This means the local government must allocate more of their own resources to cover reductions in the grant.

Implementation Oversight and Risk Management

Unlike some other performance-based grant mechanisms (such as the Water Hibah, which is paid after the installation of new water connections is confirmed) the IEG is paid before it is used. This does present a risk that the LG will take the money and then not comply with the terms of the grant agreement. This risk is being managed through proper oversight using a "verification consultant". If there are instances where funds are expended outside the parameters of the grant, the expense of the non-conforming works will be deemed an "ineligible expenditure" and under the terms of the Implementation Agreement those funds would have to be either reallocated to an approved component, or returned.

Results to Date

The sanitation IEG programme has received enthusiastic support within GoI and LGs. One reason for this is the greater flexibility it gives LGs to apply the grant funds compared to output-based funding. It

also gives them greater responsibility and control, although with penalties for non performance.

It also offers positive recognition to the participating LGs since these are quite exclusive grants; only 22 out of 491 LGs are participating. We have found that so far these LGs have risen to the occasion and are on track to meet all of the qualifying criteria for successful implementation of the programme.

The future of the IEGs looks promising. So far, they have been applied to two basic components of sanitation, but there is one more that has not been addressed yet: drainage. As the success of this mechanism is further proved, drainage may also be addressed by IEGs in IndII Phase II, which will then have the potential to contribute to comprehensive enhancement of Indonesia's urban sanitation. •

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Sanitation by the Numbers

450 grams/day
The average amount of solid waste generated by each one of Indonesia's 232 million inhabitants.

73,500
The number of workers formally employed in the domestic waste management sector in Indonesia. They work primarily as street sweepers, handcart operators, truck drivers, administrators, and landfill operators.

Rp 10,000/year
The approximate amount per person spent on solid waste management in 2006, the latest year for which figures are available.

20%
Proportion of street drains in Jakarta that are blocked by permanent or temporary structures, making surrounding areas prone to flooding.

Rp 15,800
The average amount per month that an urban dweller in Indonesia is willing to pay to have a toilet with a septic tank, according to a study from the University of Indonesia.

62.4%
The proportion of Indonesian households that should have access to adequate sanitation by 2015 under the Millennium Development Goals.

The Expert View

The Question: "What do you think is the single most important step to be taken by government, at the national or local level, to improve the quality of sanitation for Indonesia's urban residents?"

Ir. Mohamad Sjukrul Amien, MM
Director of Sanitation and Housing Development
Directorate General of Human Settlements
Ministry of Public Works

"The most important priority is to enhance the empowerment of the community. As the most important actors, the community needs to take ownership of the means to develop sanitation. This requires programs of assistance and technical support so that they are aware of how to plan, manage and conduct sanitation efforts. The duty of the central government is to motivate city and kabupaten governments to make the community aware of the environment. This kind of socialisation programme is most effective when it is carried out in a horizontal rather than a vertical fashion. The City and Kabupaten Alliance for Sanitation (Aliansi Kota/Kabupaten Peduli Sanitasi), which encompasses 80 cities and kabupaten, has been founded for this reason. City and kabupaten institutions must first have an understanding of how to develop their programme strategies. The central government role is only as facilitator, providing technical assistance to map current conditions and make sanitation strategy. This strategy has already been in operation for three years and has been conducted in 128 cities/kabupaten. The core programme actors are the people themselves."

Prof. Heru Subiyantoro, Ph.D.
Secretary, Directorate General of Fiscal Balance
Ministry of Finance

"Anywhere in this part of the world, generally speaking sanitation work should be the responsibility of Local Governments (LGs). On the other hand, we see the constraints that LGs have in funding the development of sanitation. As a strategic step, the central government is pushing for improvements in sanitation sector regulations, so that the private sector (or donors if available) can be brought in and guided to assist in completing better sanitation works through output-based projects. Output-based projects will directly benefit the community. In addition such projects can somewhat alter the mindset of central and local bureaucrats (including agencies that have the role of service providers) so that they understand how to take advantage/understand the benefits of market mechanisms. In turn, future efforts will be able to incentivise the private sector or donors to undertake sanitation projects. But if sanitation projects are turned entirely over to market mechanisms there is a possibility of failure, keeping in mind that sanitation projects don't produce profits. On the other hand, if the government alone shoulders sanitation efforts, it will be a burden on the budget. Therefore, the central and local governments may intervene in the form of regulations that may encourage the private sector or donors to carry out sanitation projects needed by the public."

Glossary

Note: The definitions given in this glossary are intended to accompany the articles in Prakarsa Compendium. In some cases the terms below have broader or additional definitions that apply when the terms are used in other contexts.

Bearing capacity: This is a measure of how much pressure the soil can withstand without failing.

Carrying capacity: The carrying capacity is the maximum number of people/amount of goods that a vehicle or system is designed to transport. The carrying capacity of the railway network in Java can be increased by increasing either the number of rail tracks or the throughput (number of trains) that can be carried on existing tracks. As used on page 46, the carrying capacity refers to the throughput on existing tracks. With 100 percent locomotive availability, the metric annual carrying capacity (for freight or passengers) could be high. With reduced locomotive availability due to idling, the annual carrying capacity would be lower.

Embryo sewerage unit: This is an organisational unit within the city government dedicated to the task of developing and operating a system of pipes for collection of wastewater (sewerage), typically where none exists. Establishment of such a unit should create a "champion" for improved wastewater management practices in the city, where none exists at present. The unit needs to handle all major management functions, not only operation of sewerage.

First and last mile: Urban planners refer to the distance that travellers must cover at the very start and very end of their journeys as "first and last mile". A comfortable and affordable bus service may be rejected in favour of commuting by private car, if the closest bus stops are half a mile from home and a mile from the office and there is no convenient way to get from the bus stops to the terminal points.

Full cost recovery: FCR means that the fees charged for a service are enough to cover all operating costs, depreciation, and debts service costs as well as staffing, accounting systems, information technology and other costs often considered to be "overhead."

Fungible: A sum of money that is fungible can be used interchangeably for different items and is not restricted to being used for one expenditure.

Imhoff tank: The Imhoff tank, named after its inventor, is a chamber for receiving and processing sewage. Like a septic tank, it is a relatively simple mechanism, but its two-chamber construction eliminates many of the drawbacks of a simple septic system that mixes fresh sewage and septic sludge.

Infiltration: "Infiltration" means that groundwater and storm water are entering into dedicated wastewater systems. The water enters through cracks or leaks in the system that can be caused by poor design, installation or maintenance errors, age-related deterioration and other causes.

Inpres: This Inpres is a type of presidential regulation in Indonesia; short for *Instruksi President.*

Intelligent transport systems: Intelligent transport systems use information and communications technology to develop systems to manage the use and flow of vehicles, load sizes, and route selection with the goal of improving safety, reducing vehicle wear, minimising transportation times, and cutting fuel consumption.

Kabupaten: This is an autonomous administrative division of the government in Indonesia, equivalent to a shire in Australia. Kabupaten are made up of smaller administrative units called *kecamatan*.

Lifeline tariff: A pricing strategy that provides a minimal amount of water either free or at a low price. After the initial amount of water is used, additional water consumption is charged at a higher price.

Glossary

Load factor: The load factor is a measure of the extent to which the capacity of a commercial transport vehicle is being used. A full angkot has a high load factor, but an angkot that is nearly empty has a low one. Load factor is generally defined as how crowded a public transit vehicle must be before additional service is added. It is usually written out to two decimal places which represent the percentage of the seats that are filled. For example, a 1.00 load factor means that every seat on the bus is full, 1.25 means that every seat on the bus is full and the number of standees equals 25 percent of the number of seats on the bus, and so on.

Megapolitan area: A megapolitan area is an agglomeration of urban governments (much like greater NY and Sydney). The term was first applied by President Susilo Bambang Yudhoyono and Jakarta Governor Fauzi Bowo to refer to the Local Governments of Tangerang, Bekasi, Bogor, and DKI Jakarta, which would share certain administrative arrangements while they retained other jurisdictional rights and obligations.

Mode share, modal share: This term is used by transport specialists to describe what portion of all transport activity (along a corridor, within a city, in terms of freight movement, or as otherwise defined) is done through a particular mode, such as trains, automobiles, etc. With respect to freight in particular, the mode share is the proportion of the total freight market which is carried by a particular mode of transport. In the example of freight transport in Java, the principal freight transport modes are road and then railways (and thereafter aviation, which has very low modal share of the market).

Negative externality: A negative externality is a cost not borne by the individual or entity causing it. For example, a company can release effluent into rivers and an individual can toss their trash into the street without a direct personal cost, but the consequences will be borne by the larger society.

Non-revenue water: NRW is water lost through broken pipes and unregistered connections.

On-granting: The on-granting mechanism refers to the regulatory framework by which the Government of Indonesia transfers grant funds to regional governments and maintains accountability for the use of the grants.

Paratransit: Paratransit is an alternative mode of flexible passenger transportation, often using mini-buses, bajaj, etc., that does not follow fixed routes or schedules.

Receiving water: Receiving water is a body such as a stream or lake into which wastewater flows.

Rolling stock: This term is used in the railway sector to refer to all elements of the system that move (locomotives, wagons/passenger cars, guard vans, etc. – as opposed to stationary assets such as train tracks, signaling equipment, etc.).

Sewerage and sewage: Sewage refers to wastewater, while sewerage is the network of pipes that carry it.

Social marketing: Social marketing is the use of marketing and advertising techniques to change people's behaviour to achieve a policy goal, such as a "stop smoking" campaign designed to improve public health.

BAPPENAS

KEMENTERIAN KOORDINATOR BIDANG PEREKONOMIAN
REPUBLIK INDONESIA

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