Journal of the Indonesia Infrastructure Initiative

PRAKARSA

Issue 11 / July 2012

Cross-Cutting Themes

■ Gender ■ Monitoring & Evaluation ■ Impact Assessment

■ Environment & Sustainability ■ Risk Management

CONTENTS

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Australian AID

Editor's Message

"Cross-cutting" is a popular term among people who work in development, but there is no universally agreed-upon list that defines the most important cross-cutting themes for all organisations. AusAID cross-cutting policies include environmental management; child protection; disability inclusive development; displacement and resettlement; and gender equality and the empowerment of women. Themes identified by the Government of Indonesia in various programs include gender, poverty alleviation, and capacity building. Other institutions identify topics as varied as HIV/AIDS, conflict prevention, accountability, and information technology among their key cross-cutting concerns.

Without a pre-defined list of topics, we had substantial freedom to decide what subjects to include in a ***Prakarsa*** edition on "cross-cutting themes". This edition looks at four of them: gender, environment, monitoring & evaluation, and risk management. Why choose these topics? They are far from the only ones we could cover, but each of these subjects does speak particularly well to the challenges inherent in most infrastructure work. A distinguishing characteristic of many activities in sectors such as water and sanitation or transport is their size: the scope is broad, the cost is significant, and the number of people whose lives will be affected is large. The cross-cutting themes addressed in this issue achieve particular urgency in these circumstances. A new sewage treatment facility will cause permanent changes in the local environment. The opportunity to improve the lives of women is immense when tens of thousands of households are gaining access to water. Demands for evidence of successful outcomes, and concerns about risks, are especially pressing when the investments being made are measured in millions of dollars or billions of rupiah.

But while the large size of most infrastructure activities offers a rationale for focusing on the cross-cutting themes we've included here, it doesn't explain why other key cross-cutting topics were left out. (And to be fair, size is not the only determinant of whether an initiative, in infrastructure or another sector, is important.) This is no cause for concern, however, as cross-cutting issues can be discussed any time, not just in this issue. In fact, the October 2012 edition will be entirely devoted to the cross-cutting subject of output-based aid. In other words, this is neither the first nor the last time that important cross-cutting themes will be the focus of ***Prakarsa***. • CSW

Infrastructure by the Numbers

.505

Indonesia's "Gender Inequality Index" as measured by the UNDP. This is a composite measure reflecting inequality in achievements between women and men in three dimensions: reproductive health, empowerment, and the labour market. A score of 0 would be perfect equality; 1 would be complete inequality. Indonesia has made small but steady gains since this index was introduced in 1995.

80%

The percentage of all emissions in transport sectors that comes from road transport.

6

The number of steps needed to develop a Monitoring & Evaluation plan, according to the International Fund for Agricultural Development. The steps are: establishing purpose and scope; identifying performance questions, information needs, and indicators; planning for information gathering and organising; planning critical reflection processes and events; planning for quality communication and reporting; and planning for the necessary conditions and capacities.

334

The number of randomised control trials examining the impact of development programs on poverty in the database of the Abdul Latif Jameel Poverty Action Lab (J-PAL) as of June 2012.

Level 2

The readiness level of public authorities in Indonesia to conduct effective risk management in the development of Public Private Partnerships for infrastructure, according to the study "Assessing Readiness of Public Sector Risk Management for PPP in Infrastructure Development in Indonesia" (presented at an international conference in 2010). Level 1 is ad hoc, level 2 is initial, level 3 is competent, and level 4 is excellent.

The Growing Role of Monitoring & Evaluation: The IndII Experience

As budgets and demands for accountability grow, specialists in Monitoring & Evaluation are playing a more important role in assessing program success. • By Ty Morrissey

An important element of qualitative monitoring & evaluation is talking directly to people whose lives are affected by program interventions. *Courtesy of CIFOR*

As international development programs grow ever larger in scope, complexity, and cost, the role of Monitoring & Evaluation (M&E) has become increasingly important. Donor agencies and recipient governments are closely scrutinising programs, demanding accountability and transparency. The pressure is on M&E processes to provide measurable data on whether and how programs are meeting goals and producing the intended results.

M&E for the AusAID funded Indonesia Infrastructure Initiative (IndII) is not immune to these trends. In fact, IndII's M&E component faces unique challenges due to the significant level of funding and the high profile nature of infrastructure activities funded through the Australian Government in partnership with the Government of Indonesia (GoI).

At its most basic level, M&E consists of two elements. The first is the monitoring element, which is *the routine tracking of the key elements of program/activity performance (usually inputs and outputs) through regular checks and reporting.* Second is evaluation, which is *the systematic and episodic investigation of the value, importance or significance of something or someone along a defined framework (i.e. program).*

The use of both quantitative and qualitative approaches has expanded enormously over the past few decades in the M&E field. As a result, a wide variety of techniques are now available to M&E specialists for monitoring & evaluating activities, programs, and interventions.

On the qualitative side, the goal of employing these techniques is to create a non-numerical description of experiences, characteristics, performances, and other dimensions of an activity. This can be done through conducting field observations, interviews, and focus groups, and by developing performance stories.[1] Each of these techniques is aimed at obtaining a detailed understanding of the underlying causes, behaviours and motivations that promoted change. Qualitative approaches emphasise understanding people's experiences in context, and how interventions change those experiences.

Alternatively, quantitative approaches focus on the ability to collect numerical data, especially over time so that change can be measured. Statistical tools can be applied to numerical data and the results can be extrapolated to a broader population.

Both qualitative and quantitative approaches have value in an IndII context and both approaches are utilised. By employing both approaches, IndII is able to create a rich set of data and information for interpretation and analysis. The challenge for M&E specialists is to strike a balance, within each activity being monitored and evaluated, between qualitative and quantitative approaches.

Key Points

As international development programs grow ever larger in scope, complexity, and cost, the role of Monitoring & Evaluation (M&E) has become increasingly important. M&E for the Indonesia Infrastructure Initiative (IndII) faces unique challenges due to the significant level of funding and the high profile nature of infrastructure activities funded through the Australian Government in partnership with the Government of Indonesia (GoI).

"Monitoring" *is the routine tracking of the key elements of program/activity performance (usually inputs and outputs) through regular checks and reporting. "Evaluation" is the systematic and episodic investigation of the value, importance or significance of something or someone along a defined framework (i.e. program).*

The use of both quantitative and qualitative approaches has expanded enormously over the past few decades in the M&E field. On the qualitative side, the goal of employing these techniques is to create a non-numerical description of experiences, characteristics, performances, and other dimensions of an activity. Quantitative approaches focus on the ability to collect and analyse numerical data, especially over time so that change can be measured.

Both qualitative and quantitative approaches are utilised at IndII. In the revised M&E Plan for Phase 2 of the IndII program, a key shift in approach is the emphasis on using M&E as a management and planning tool, rather than viewing it strictly as a reporting or contractual requirement. As part of this, quality baseline data is being gathered, and outcomes and methodologies are being explicitly established.

IndII has recently developed a revised M&E Plan for Phase 2 of the IndII program. A key shift in approach from Phase 1 is the emphasis on using M&E as a management and planning tool, rather than viewing it strictly as a reporting or contractual requirement. As part of this shift, quality baseline data is being gathered and desired outcomes are being clearly defined in the early stages of program planning. The methodologies (qualitative and quantitative) that will be used to determine whether these outcomes have been achieved are also being explicitly established.

During the past year IndII's M&E team has worked with technical staff to develop logic models[2] for the transport sector and the water and sanitation sector. These models provide a framework for both

planning and communicating strategies and intended results. Logic models specify what an intervention is expected to achieve and the interlocking steps that lead to the desired result. They are a tool not just for evaluation purposes but also to generate interest and buy-in from stakeholders regarding what measurements and reports are significant. In effect, logic models are important tools not only for M&E but also for planning, design, implementation and management.

IndII's M&E plan retains a simple, flexible and responsive approach but also stresses rigor in the application of both qualitative and quantitative approaches. In particular, IndII will be introducing more quantitative methods through the use of Randomised Control Trials (RCT) and associated impact studies to provide strong evidence of change and impact that can be directly attributed to the interventions and investments provided through IndII. (For more information about RCT, see "Randomised Control Trials: the Gold Standard of Impact Evaluation" on page 17.) To enhance reliability and credibility, external teams will conduct many of these reviews and evaluations so that results can be verified and checked accordingly.

Qualitatively speaking, IndII will also undertake a series of internal evaluations and case studies aimed at collecting data and information that highlight changes in individual and organisation practices. For example, IndII will follow up with professional auditors from the Inspectorate General of the Ministry of Public Works who participate in Risk-Based Internal Audit training. The follow-up will assess changes in their behaviour and illuminate how the training funded by IndII is building professional and technical capacity. Other examples will include assessing the impacts of water and sanitation upgrades on people lives. IndII will examine how access to clean water combined with training is promoting changes in hygiene and general health conditions.

More Than Just Reporting

Sound M&E approaches can reveal both strengths and weaknesses of programs being assessed, leading managers to take the appropriate actions. An example on the strength side is the evaluation of IndII's Water Hibah program. IndII's Hibah programming in Phase I used an output-based grant mechanism to encourage local governments to invest in water supply. External evaluation demonstrated the effectiveness of this approach, leading to program expansion and also the trialling of similar grant programs in other sectors.

On the other hand, an internal M&E review of an IndII program to support Community-Based Organisations (CBOs) to upgrade piped water services with private sector support found that the program was not meeting its desired outcomes and targets. The original goals were to:

- Link 25 CBOs to credit financing through a commercial (micro-finance) bank.
- Introduce service obligations agreements between local governments and CBOs with associated monitoring through benchmarking.

The program fell short of these goals; ongoing monitoring made it clear where the problems were. (Absent a regulation requiring them to engage with CBOs, banks were unwilling to support the programs, and the CBOs suffered disillusionment as well as capacity limitations.) Program refinement and changes in direction were required; the M&E team recommended developing suitable regulations and devoting more resources to socialisation and training efforts with CBOs and banks. New programming has been designed around these recommendations. Further review is planned to determine the success of these changes.

The increased interest in M&E has given M&E a higher profile and an expanded role in programming, thus creating opportunities for real engagement and support. The use of both internal and external evaluations and both qualitative and quantitative approaches make M&E a useful and exciting field. The challenge will be to maintain relevance over time, to clearly communicate results, and to ensure that management decision-making is influenced by the results and data that emerge. ■

NOTES

1. A performance story is a concise report that attempts to clearly describe the mechanism by which a program activity led to desired outcomes.
2. A logic model is a graphical representation, often in the form of a flow chart, that shows step by step how program inputs and activities are expected to lead to desired results.

About the author:
Ty Morrissey is the Monitoring & Evaluation Specialist at IndII. He has 15 years' experience in program design and M&E. He has designed a range of M&E systems and frameworks for recent large scale AusAID programs in Papua New Guinea, China, Afghanistan and Indonesia. Ty holds an undergraduate degree in development studies and a Master's Degree in Business Administration degree. He is currently completing a second Master's Degree in Evaluation.

A Close-Up With the Author

*In addition to preparing a **Prakarsa** article, Monitoring & Evaluation specialist Ty Morrissey spent a few minutes chatting with Prakarsa to offer a glimpse into his personal passion for M&E. Some highlights follow.*

Prakarsa: **What is the current direction of M&E approaches with regards to infrastructure investments in Indonesia?**

Morrisey: M&E has become such an interesting area over the last couple of years, particularly with respect to Indonesian infrastructure, primarily because of the real increase in budgets for overseas development assistance, in particular for infrastructure investments. But it isn't just about overseas donors; the Indonesian Government is willing to spend a lot more to increase the level and quality of infrastructure. That increase in budget and expenditure creates pressure for greater accountability and demonstrated results, particularly on the quantitative side, whether it is kilometres of road built or numbers of household connections to water or sewerage. With M&E, we try to demonstrate a correlation between the amount of money that's being expended and the results that are achieved.

On the qualitative side of M&E we tell people's stories, examine their perceptions and see if their behaviours and understanding are changes. Quantitatively, we perform data gathering and statistical analysis and data gathering. Recently, the shift has been toward a much more quantitative and statistical emphasis. There is still a fair bit of debate as to whether that is the

definitively most critical part of M&E. Because it is all well and good to provide statistics on returns on investment and the like, but you don't want to overlook the narrative. What we try to do at IndII is to not only get the hard data, but also uncover that personal story, in terms of how infrastructure has actually impacted people's lives. We're always trying to maintain that balance between the quantitative and the qualitative.

Is it even possible to measure impacts that are hard to reduce to numbers, such as improvements to "quality of life" because there are more or better roads?

I think it is possible. We just have to be careful about how we define what success is, and be careful not to assume that all changes in a community must be the result of a particular intervention. For example, just because we build a road we can't automatically assume that localised changes in health care or access to education are specifically attributable to that piece of infrastructure. However we can, if we define it correctly, look at some specific immediate impacts that will benefit the people who use the infrastructure. So for qualitative research to be relevant and appropriate, we need to figure out up front what kind of changes we are looking for, and how do we tie the qualitative aspects to the quantitative measurements. So we can measure things like improvements to quality of life, but we need to be realistic and keep the M&E relevant to the practical interventions being done, rather than trying to make grandiose statements and attribute all these long term changes to our interventions.

How does that philosophy affect the way you develop an M&E plan?

IndII has recently had its M&E plan for Phase 2 approved by AusAID, and now it's being operationalised. We found that as we designed that revised plan, we became more aware of how M&E is an important planning and management tool, and how we need to determine desired outputs and means of measurement up front. That means that we are now much more directly involved with technical teams to map out exactly what interventions will be expected to achieve and also to define the targets, indicators and what methodologies we want to use. And we define our outcomes as short term, intermediate and longer term. Now we have more accountability. And our findings can be used as part of a communications strategy, to explain to an outsider how an activity is really working.

What about the cost of all those methodologies? A good M&E plan considers the cost of an activity and the return on investment before declaring it a success. But some M&E techniques themselves might be expensive to implement. Is it affordable to do high quality M&E?

That's a good question and something we need to keep in mind at IndII. We are a project, not a research institution, and we don't have a mandate to constantly undertake research. By defining what we want to see and what we want to measure, we create a framework for determining the most appropriate approach. Every activity is going to have a baseline study or impact study, but we tend to prioritise and tailor our approaches to the size of the program. A guide from the Australian Government is that an activity should have no less than 5 percent of its budget

allocated to M&E. That number is increasing – there's talk of 10–15 percent now. Any particular number is nothing but a very rough guide. If the activity is complex or it has strategic importance to the Government of Indonesia and the Government of Australia we would probably look at developing more in-depth methodologies. So expenditures are tailored more to the specific needs of an activity, rather than taking a blanket approach for M&E generally.

You are an internal evaluator at IndII, as opposed to someone who comes in from the outside to do an evaluation. How do you perceive that role and its contribution to communicating effective results and impacts for IndII?

Traditionally in the M&E field evaluators were perceived as external. You would ask an evaluator to come in to provide an outside assessment of how a program or an organisation was doing. But recently there has been a steady growth in the use of skilled internal evaluators.

Internal evaluators are sometimes criticised by external donors because they perceive us as being biased. We might have conflicts of interest or we might not be objective in our views. Those are valid points. But looking at it from the other side, internal evaluators are important. Particularly in large complex programs like IndII, you need an understanding of the context in which you're working, and you need to have a relationship with the technical teams. You know what the main issues are and what's important to evaluate and what's not so important. That explains the shift away from purely relying on external evaluators, who also are very expensive. In some cases, they need to come in on very short notice, they need to do a massive amount of work, and they don't have an opportunity to build rapport with the technical teams, let alone Government of Indonesia officials or beneficiaries. It's not that you have to choose between internal and external evaluation. They can complement each other. You can have a good quality internal evaluation which can provide the data, information and verifications which can then be checked by an external team.

One of the safeguards of internal M&E is that you start it from day one. You can't just come in at the end, retrospectively pick out successes, and ignore the parts that didn't work. If you said you were going to examine certain parameters when you started, and some of them turned out to be not very successful, you need to explain that. You might be able to justify the lack of success, but you can't ignore it. So internal evaluation sounds like it offers some advantages?

I think it's fantastic myself. Another interesting point is that in the past an external consultant might come in to design an M&E system, and then they would leave and then the contractor would be engaged and would have to try to implement a system which they might not even understand. Now AusAID is looking for people who can design, implement and manage a whole process. That raises the profile of the internal evaluator, because you are, as you say, taking on the responsibility from day one. You do assume ownership for it to some degree, but at the same time you can be very accountable.

So, what does the future of M&E look like at IndII?

Things are looking good. There is greater understanding and greater engagement. People really do want to know the results of their interventions and investments, whether it's a personal level or an organisational level. So we need quality and rigor. It's fine to say that M&E is important and we have a great role at IndII, but with that comes great responsibility in terms of making sure our systems and processes are transparent, that we do at all times try to remove bias and maintain rigour, and that our results and data are actually used to make decisions, and that we restructure or refocus activities, or perhaps make the hard decisions that some activities are no longer required. These are things that M&E should be used for. And also to communicate. ■

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Women, Men and Infrastructure Development

Women and men can have different needs for infrastructure, as well as different levels of involvement in decision-making. When infrastructure programs are designed to take this into account, the results can be better for the entire community. • By Gaynor Dawson

When decisions are being made, women may have a different perspective from men.
Courtesy of IndII

What is gender about? The subject of gender looks at the different roles, responsibilities and attributes that society assigns to women and men or girls and boys, and considers appropriate for them. Gender roles are not universal. Expectations differ among societies and also change throughout history. Because of their different roles, women and men have different experiences, different needs, and different concerns and opinions. Their opportunities to participate in activities, and the barriers they face, are different.

Attributes ascribed to women and men determine how they relate to each other and who has more power in their relationships. The differences can create inequalities. For example, society may view men as household decision makers. Therefore, it may not be considered appropriate or necessary for women to be involved in public decision-making, even though women may have different perspectives and the decisions that are made will affect them too.

Education and training that can lead to advancement in the workplace and higher incomes may be focused on men, because they are viewed as the family's income earners. Women may be denied the same opportunity because they are seen as responsible for caring for their husbands and children and ensuring the smooth running of the household. Therefore, fostering their income-earning capacity is not viewed as important. This may be especially true when capacity-building activities, such as international study tours or academic scholarships, would take women away from home.

Gender and Development

The essence of development is to bring about just and equal societies with freedom for all.[1] The ability to live freely without oppression, discrimination or disadvantage is a human right and should be available to everyone regardless of whether they are male or female.[2]

Development work can contribute to improving gender equality when efforts are made to ensure that gender disparities are eliminated and that women participate and benefit equally with men. On the other hand, if development efforts ignore the different needs, concerns and constraints faced by women, or if one group is given advantages over another, development can reinforce gender inequality.

Gender equality is not just a right that Indonesia and Australia have agreed to uphold; it also makes economic sense. The World Bank points out that:

- Broad productivity gains can be achieved by removing constraints to women's access to education and economic opportunities.
- Improving the status of women supports other development goals, including improvements to child welfare.
- Supporting the right of women to have an equal voice in public decision-making will eventually lead to more inclusive institutions and comprehensive policy directions.[3]

The different needs, concerns and constraints faced by women and men should be taken into consideration during the design and implementation of development programs. This will lead to improved program targeting, wider community participation, and more efficient and effective program outcomes.[4]

Key Points

Because of the different roles that society assigns to them, women and men have different experiences, needs, and opinions. Society may view men as the decision makers and consider it unnecessary for women to be involved in public decision-making. Education and training may be focused on men, because they are viewed as the family's income earners.

The essence of development is to bring about just and equal societies. Development work can contribute to improving gender equality when efforts are made to ensure that gender disparities are eliminated and that women participate and benefit equally with men. This leads to economic and social benefits by encouraging productivity gains, improving child welfare, and leading to more comprehensive public policies.

Both the Indonesian and Australian governments have established policies and regulations to promote gender equality. In the field of infrastructure, development that benefits both sexes equally can be critical to improving gender equality.

Women and girls are the primary users and managers of water for the household and they are also usually seen as responsible for household hygiene. Therefore, when water and sanitation access is improved, they will benefit from the reduction in time and energy spent carrying water, and from the reduction of illness and time spent caring for sick family members.

Access to adequate transport is important for everyone, but may affect women and men differently.

Because of their gender roles, women and men and girls and boys have different travel needs, priorities, and patterns. These must be identified and considered when planning and implementing transport services to ensure that the services provided satisfy the needs of both women and men.

The objective of the AusAID funded Indonesia Infrastructure Initiative (IndII), as expressed in the IndII gender strategy, is to implement gender responsive activities in which women and men have equality in participation, access, control of resources, leadership, and decision-making opportunities; and they share the development benefits equitably at government and community levels.

It's Not Just About Women

Gender is not only concerned with women. It is about both men and women and the relationships between them. Where efforts are being made to address discrimination or disadvantages faced by women, it is essential that men support these efforts, and understand the benefits to families and communities that improved gender equality can bring. Without encouragement and agreement from men who are the main power holders in the society, change will not happen.

Aside from addressing discrimination, other changes in gender relationships are also important. Men need to be encouraged to support women by sharing domestic work. When time-consuming chores such as water and firewood collection, housework, and child care are shared, women will have more time to participate in other activities.

While women are often the ones who are disadvantaged or who require special support to improve their situation, men and boys also have particular needs. For example, young men are the most likely to be injured or killed in road crashes and are the most frequent perpetrators and victims of violence. Road safety and justice initiatives need to be designed to target young males in effective ways. In some regions of Indonesia, young boys are less likely to be immunised and are more likely to have lower nutrition status than girls.[5] Health programs need to take this gender factor into account in their designs and targeting.

Policy and Regulatory Framework

Most donors have gender policies and gender equality requirements built into the programs and projects they support. The Government of Australia (GoA) requires that gender equality is taken into account in all development activities. Gender equality is viewed as a human rights issue, as well as being essential for reducing poverty and supporting economic growth. At the program level, GoA's gender equality strategy[6] recognises that initiatives will be more effective and sustainable if they respond to the different roles and needs of women and men. Three of the 10 development objectives in GoA's overall aid policy document, *An Effective Aid Program for Australia*, are related to gender equality and the empowerment of women.

The Government of Indonesia (GoI) has also established policies and regulations for gender mainstreaming and the improvement of gender equality. GoI Presidential Instruction (Inpres) no. 9/2000 requires that gender mainstreaming be a component of national development efforts. In 2002, a manual entitled *Panduan Pelaksanaan Pengarusutamaan Gender dalam Pembangunan Nasional (Guidelines for the Implementation of Gender Mainstreaming in National Development)* was issued by the State Ministry for Women's Empowerment to provide government agencies with directions to implement Inpres no. 9/2000. The manual follows a gender analysis pathway approach, which requires the collection and analysis of sex disaggregated data to identify different life pathways being taken by males and females. *GoI's Medium Term Development Plan 2010–2014 (Rencana Pembangunan Jangka Menengah 2010–2014)* requires that gender be mainstreamed for more effective and equitable development.

At the Local Government (LG) level, the Ministerial Regulation of the Ministry of Home Affairs, Permen no. 15/2008, requires LGs to formulate policy, programs and activities from a gender perspective. Under the auspices of the Ministry for Women's Empowerment and Child Protection, there are Women's Empowerment units at the LG level to assist in the implementation of gender mainstreaming and women's empowerment efforts.

Gender and Infrastructure

It cannot be assumed that infrastructure is automatically equally useful or beneficial to women and men. Because of their gender roles, women have different life experiences, needs, priorities and constraints which affect their demand for infrastructure and their access to and use of infrastructure. Gender roles also affect women's and men's involvement in decision making regarding the construction and management of infrastructure. Frequently, women are not involved in decision-making about the type of infrastructure and its design, its location, its use, the costs which will be incurred by households, or how it will be managed after construction. Men may be prioritised and women may be excluded from income-earning and training opportunities which arise during the provision of the infrastructure, and from representation on community committees which make important decisions.

Infrastructure and Women's Empowerment: An Example of Success

The topics of road development and gender may not seem to have much in common, but the Peru Second Rural Roads Project, a World Bank initiative, demonstrates otherwise. This project won an award from the Independent Evaluation Group for its gender dimension.

Through road repair and construction, the project aimed to improve the access of the rural poor to basic social services, income-earning activities, and markets. Through participatory assessments, the project engaged women in making decisions about the scope and scale of the project.

- Grants were awarded for the construction of footpaths, which are preferred by women because they are the easiest and safest way to take their animals to pasture and to collect firewood and water.
- Access to roads and paths increased women's mobility, safety, and time management, and allowed them to obtain new sources of income.
- Twenty four percent of the semi-skilled positions related to the project were held by women.
- Forty five percent of the road committee treasurers were women.
- Twenty four percent of road committee members were women.
- Women's presence on road repair microenterprise teams increased the efficiency and quality of the work because men drank less and worked more, while women paid greater attention to the quality of the work.
- Both women and men who worked in the project's microenterprises became more active in local governance through increased voting and running for office.
- Men's and women's perceptions of women's worth and status in the household and community improved significantly.

Yet infrastructure which women and men, girls and boys can use and benefit from equitably can be critical to improving gender equality and empowering women. For example, information and communications technologies can give women farmers access to information about market prices, better methods of crop production, and the availability of government support. Irrigation system improvements can improve the productivity of crops typically grown and sold by women. Energy improvement programs can reduce the time spent by women and children collecting firewood for cooking, and enhance the efficiency of women's income-earning activities with improved technology and lighting. Improved cooking technologies lead to health improvements because pollution from wood-burning fires is reduced.

Water and sanitation are also important to gender equality. Women and girls are the primary users and managers of water for the household, and they are also usually seen as responsible for household hygiene. Therefore, it can be expected that where water and sanitation access is improved, women and girls will benefit greatly from the reduction in time and energy spent carrying water, and from the reduction of illness and time spent caring for sick family members.[7] This enables women to have more time for other activities, including productive and social activities, and for leisure. Where sanitation facilities are improved and provided closer to home, privacy and security for women and girls are also enhanced.[8]

While access to improved water and sanitation is beneficial to women in practical ways, more strategic and empowering aspects need to be addressed, such as their involvement in decision making, management of construction, and operation of facilities. Women have a key interest in ensuring that water and sanitation facilities operate well and satisfy their household needs. Efforts need to be made to ensure that they are engaged in decision making from the initial stages. For instance, women need to be involved in decisions about the type of toilets to be installed to suit all family members' needs, including those of small children; how community toilet and washing facilities can best be managed; where community toilets should be located; and the use of land located above communal septic tanks.

Women are often the managers of household money for daily expenditures. This may include payments for services such as water and electricity and cleaning septic tanks. Therefore, women's opinions about capital and recurring expenditures need to be considered.

Access to adequate transport is important for everyone, but may affect women and men differently. Transport enables people to carry out day-to-day activities essential to household income and the economic health of the wider community. It promotes commerce and trade; access to education, health and other essential welfare services; and engagement in community and social activities. Because of their gender roles, women and men and girls and boys have different travel needs, priorities, and patterns. These must be identified and considered when planning and implementing transport services to ensure that the services provided satisfy the needs of both women and men. (This topic is explored more fully in "Safe and Comfortable Transport for Everyone: A Goal in Progress" by Eko Utomo on page 33).

Benefits to Women: The Water Hibah Program

The topics of road development and gender may not seem to have much in common, but the Peru Second Rural Roads Project, a World Bank initiative, demonstrates otherwise. This project won an award from the Independent Evaluation Group for its gender dimension.

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- Twenty four percent of the semi-skilled positions related to the project were held by women.
- Forty five percent of the road committee treasurers were women.
- Twenty four percent of road committee members were women.
- Women's presence on road repair microenterprise teams increased the efficiency and quality of the work because men drank less and worked more, while women paid greater attention to the quality of the work.
- Both women and men who worked in the project's microenterprises became more active in local governance through increased voting and running for office.
- Men's and women's perceptions of women's worth and status in the household and community improved significantly.

Men are more likely than women to have their own vehicle and women therefore tend to be more dependent on public transport or on walking to take them where they need to go, for example to and from work, health clinics, and markets. Sidewalks and roadsides need to be safe for pedestrians, especially for pregnant women and those carrying heavy loads or children. Routes and schedules for public transport need to be designed with women's needs and destinations in mind. Women, on average, earn less than men so the costs need to be affordable.

In regional areas, programs for the construction of new roads or road repairs coupled with the provision of reliable and affordable transport services can make significant differences to girls' schooling. With easier, quicker and safer access to education facilities, parents are more likely to allow their daughters to continue their education.

The Indonesia Infrastructure Initiative Approach

The objective of the AusAID funded Indonesia Infrastructure Initiative (IndII), as expressed in the IndII gender strategy, is to implement gender responsive activities in which women and men have equality in participation, access, control of resources, leadership, and decision-making opportunities; and they share the development benefits equitably at government and community levels. IndII's monitoring activities include an examination of the relevance and effectiveness of programming as it relates to gender equality.

Many of IndII's activities have a government capacity-building component. Efforts are made to ensure that women have equal opportunity to be selected for participation, including in lead positions. The capacity-building activities offered may include relevant information about gender and gender equality.

Some IndII activities have direct community level impacts, for example, programs that improve local access to water and sanitation infrastructure. In these activities more complex gender equality issues are identified and addressed at the design and implementation stages.

IndII is also embarking on specific gender mainstreaming activities within the Ministries of Transportation and Public Works that support the efforts of government officials to increase awareness of gender and implement programming that encourages gender equality. These activities support goals and values shared by Indonesia and Australia. ■

NOTES

1. *Gender Equality and Development World Development Report 2012.* World Bank.
2. *The international Convention for the Elimination of all Forms of Discrimination Against Women* (CEDAW), which was adopted by the UN in 1979 and has been ratified by 187 countries, including Indonesia and Australia, provides a framework for women's advancement and equality.
3. *Gender Equality and Development World Development Report 2012.* World Bank.
4. *Gender Equality in Australia's Aid Program – Why and How 2007.* AusAID.
5. The immunisation finding is from a survey done in the Healthy Mothers Healthy Babies project in Southeast Sulawesi. The survey was purely quantitative and did not explore reasons why this finding might be the case. The nutrition data is from a Badan Pusat Statistik (Central Bureau of Statistics) report and also is not explained.
6. *Promoting Opportunities for All: Gender Equality and Women's Empowerment.* AusAID. 2011.
7. For example, the study WSP Gender in Water and Sanitation (November 2010) notes that in eastern Uganda, women spent 660 hours per year or a total of two months annually collecting water for their families.
8. *Gender in Water and Sanitation. Water and Sanitation Program, World Bank.* November 2010.

About the author:

Gaynor Dawson is a gender and social analyst expert with over 15 years' experience working on development assistance projects in Indonesia, India, East Timor, Lao PDR, Cambodia and Vietnam. Gaynor developed IndII's gender strategy and leads IndII's gender program, which includes incorporating gender initiatives in IndII's activity designs, capacity building for gender mainstreaming with partner agencies, and monitoring & evaluation of IndII's gender impact. She also provides capacity-building training for IndII staff and consultants.

Gaynor has worked extensively in the water and sanitation sector and in the agriculture, education, health, water resources, environmental, energy and transport sectors. She has a PhD in Asian Studies and Women's Studies and has authored a book and articles on gender and development. She has been undertaking academic research and consultancies across Indonesia since 1986 and has developed competent Indonesian language skills.

Randomised Control Trials: the Gold Standard of Impact Evaluation

Randomised Control Trials, especially in combination with other tools, offer a powerful tool for obtaining clear evidence of the impact of development programs. • By Anggita Cinditya Mutiara Kusuma

A Randomised Control Trial, which randomly divides populations into treatment and control groups, works best with large populations.
Courtesy of Wawan Dermawan

Will connections to clean piped water improve health in poor communities? Will road safety campaigns lead to safer driving and fewer road crashes? Has donor assistance brought about the expected positive impacts?

These are the kinds of questions that donor institutions ask when they provide various kinds of assistance in developing countries. This is to ensure that the support provided leads to positive impacts for beneficiaries. The AusAID funded Indonesia Infrastructure Initiative (IndII) should also ask these questions, in order to measure whether the work it is doing in partnership with the Government of Indonesia is indeed leading to the desired outcomes, such as healthier communities and fewer road crashes – outcomes that will contribute to IndII's larger, long term goals of stimulating the economy and improving the Indonesian people's prosperity through infrastructure development. The role of impact evaluation is to provide answers to these questions.

Impact evaluation is a component of the Monitoring & Evaluation process. Its purpose is to analyse what an activity has achieved by measuring its impacts. Impact evaluation allows program managers to conclude whether an intervention, policy, or assistance led to a positive impact on the individual, household, or community; and whether the impact can be clearly associated with the assistance provided.

As is true for many types of research, an impact evaluation study may be carried out using a qualitative or quantitative approach. Although a qualitative approach utilising tools such as in-depth interviews or focus group discussions may be useful for obtaining a comprehensive picture of the impact of a policy, a

quantitative approach is considered more appropriate to measure the overall magnitude of the impact. Among the many quantitative methods available, currently Randomised Control Trials (RCT) is considered the leading method, and is frequently used in impact evaluation studies. RCT, which is also referred to as Randomised Evaluation, has been cited as the "gold standard" of impact evaluation because it provides accurate information through the use of counterfactual analysis – in other words, it answers the question: "What would have happened if this intervention had not taken place?" (See Figure 1.) RCT is also able to minimise the selection bias that can occur when other quantitative methods are employed because the method is designed to ensure that the individuals or communities being studied are chosen in a genuinely random, unbiased fashion.

Actually, RCT is not a new method for impact evaluation. Such trials have a longstanding use in medical research. The first study using the RCT method appeared in the *British Medical Journal* in 1948. It was conducted by epidemiologist Austin Bradford Hill to test whether streptomycin is effective in treating tuberculosis. The method involved randomly dividing patients into two groups. One group received medication and the other did not. This proved to be a successful method for analysing the effectiveness of the drug and one that could be replicated in other situations. The RCT method caught on rapidly and was adopted by other disciplines, including the social sciences and the development field, where it is used to assess the impact of assistance provided in various sectors including education, microfinance, social welfare, and infrastructure. For example, RCT has become the primary method used to evaluate economic development in studies conducted by the Abdul Latif Jameel Poverty Action Lab (J-PAL), a research institution established to analyse the success of poverty eradication programs in developing countries in Asia, Africa and Latin America.[1]

Key Points

The role of impact evaluation is to determine whether positive outcomes – such as healthier communities or fewer road crashes – are taking place as a result of donor assistance. Impact evaluation can be qualitative or quantitative, although a quantitative approach is generally considered more appropriate. Randomised Control Trials (RCT) are the "gold standard" of impact evaluation because they provide accurate information through the use of counterfactual analysis – in other words, answering the question: "What would have happened if this intervention had not taken place?"

RCT has been used since 1948 in the field of medicine, and has been adopted by other disciplines, including the social sciences. In the development field, RCT is used to assess the impact of assistance provided in areas such as education, microfinance, social welfare, and infrastructure.

RCT entails randomly dividing households or individuals into a treatment group and a control group, and comparing prosperity indicators for both groups after the assistance program is operating. RCT possesses several advantages over other impact evaluation methods. Unlike a "before and after" approach, it can isolate the impact that arose directly from the intervention itself. Implementing RCT is relatively simple and it can produce meaningful results even when baseline data is not collected.

The RCT method is often applied to studies of water and sanitation programs. It is less easily implemented in the transportation sector because projects such as road construction are usually developed based on unique local features, making it impossible to randomly select treatment and control groups.

When RCT cannot be conducted, a quantitative impact evaluation can be carried out through non-experimental methods such as Differences in Differences (DD) or Propensity Score Matching (PSM). The primary difference between the non-experimental methods and RCT is the non-random selection of samples.

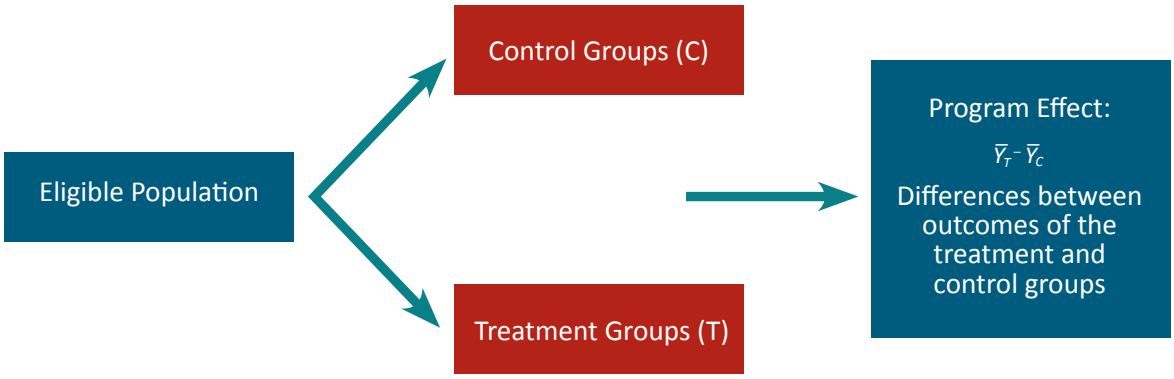
In practice, most impact evaluation studies in the donor community that use a quantitative approach combine several methods. The AusAID funded Indonesia Infrastructure Initiative is designing RCT studies to evaluate the impact of various water, sanitation, and transportation sector programs throughout Indonesia. RCT's limitations will be overcome by combining its use with that of other quantitative and qualitative methods.

RCT entails randomly dividing households or individuals into a treatment group and a control group, and comparing prosperity indicators for both groups after the assistance program is operating. It should be observed that randomisation in this context means that no different treatment (except for the "treatment" that the treatment group receives) is given to the treatment group and the control group, and that placement in the treatment or control group is not based on any particular criteria.

RCT possesses several advantages over other impact evaluation methods. First, RCT permits analysing program success through counterfactual analysis, in other words by comparing the outcomes when the program was implemented to when it was not implemented. This is different from the "before and after" method, which is unable to isolate the impact that arose directly from the intervention itself, and not from other factors. Second, because the two groups are created randomly, the only difference between the control group and the treatment group is the intervention. In other words, if the positions of the groups were reversed (i.e., the control group became the treatment group and vice versa), the conclusions obtained through the RCT would be unchanged. Third, implementing RCT is relatively simple and it can produce meaningful results even when baseline data is not collected.

In the field of infrastructure development, the RCT method is often applied to studies of water and sanitation programs. Current examples *include Impact Evaluation for Mozambique's Rural Water Supply Project* by The Millennium Challenge Corporation,[2] which is drawing on experiences in approximately 600 rural communities, and *Impact of Improved Water Supply on Water Borne Diseases* by the Asian Development Bank, which is examining the results of improvements to rural water supply in six provinces in Cambodia.[3]

Figure 1: The Randomised Control Trial Design



Source:
Impact Evaluation Methodological and Operational Issues, Asian Development Bank, September 2006

RCT is less easily implemented in the transportation sector because projects such as road construction are usually developed based on unique local features, making it impossible to randomly select treatment and control groups (see the sidebar on drawbacks to RCT). Road and railway development connects one city to another, creating regional effects that are difficult to measure, and making it hard to identify good counterfactuals. Apart from that, construction in the transportation sector requires a much longer time (typically five years) to produce comprehensive improvements in prosperity.[4]

A Valuable Tool, But Not a Perfect One

Although Randomised Control Trials (RCT) are a powerful tool for assessing and understanding the impact of an intervention, they cannot be used in every situation, and critics have pointed out several shortcomings. Some types of programs do not lend themselves to making random assignments to treatment or control groups. In the development field, a well targeted program by definition has the goal of reaching the population in the greatest need of services, so participants are not necessarily randomly selected.

The large populations that are required to properly conduct RCT can also be a drawback. If the intervention is only being implemented with a small group, there may not be enough observations to detect an impact or to state with confidence that the impact is the result of the intervention.

On the other hand, within a large trial group it can be difficult to pinpoint the effects on individuals. This is a concern, because isolating these effects can lead to a better understanding of how causality works and where future programs should be targeted.

Furthermore, the "real world" can be messier than the ideal laboratory setting that RCT methodology assumes. There is a potential spillover effect when a control group may access the intervention provided to the treatment group. For example, in the case of installing new water connections, people who are not hooked up may obtain clean water from a nearby house that has just been connected.

Some of the most serious criticisms of RCT are most likely to occur in the field of medicine, where innovative treatments for terminal conditions are being assessed. Ethical questions surround obtaining informed consent from patients to be randomly assigned to the control or treatment group, because subjects may be reluctant to join a trial if they cannot be assured of being in the treatment group. Concerns like these are generally less of a problem in the development field.

When RCT cannot be conducted, a quantitative impact evaluation can be carried out through non-experimental methods such as Differences in Differences (DD) or Propensity Score Matching (PSM). DD is a method that compares policy achievement indicators before and after an intervention is implemented on treatment groups and control groups. PSM is difficult to explain well without resorting to specialised jargon, but it attempts to match participants in the control and treatment groups using observable characteristics in order to do a better analysis of the outcomes. The primary difference between the non-experimental methods and RCT is the non-random selection of samples.

In practice, most impact evaluation studies in the donor community that use a quantitative approach combine several methods. For example, the selection of a sample is done randomly using the RCT method, certain characteristics are assessed using PSM, and achievement indicators before and after a program is implemented are evaluated using DD. The impact evaluation of the Jamuna Multipurpose Bridge Project in Bangladesh by JBIC in 2006[5] was a seminal work in the transportation sector in this regard, showing that RCT could be combined with other quantitative methods.

RCT is currently the method of choice for impact evaluation studies, including in infrastructure development, because it has been proven to be the most accurate quantitative evaluation method. IndII is designing RCT studies to evaluate the impact of various water, sanitation, and transportation sector programs throughout Indonesia. RCT's limitations will be overcome by combining its use with that of other quantitative and qualitative methods.

The most important considerations for implementing an impact evaluation are thorough preparation starting from the planning stage, and periodic measurement of the impact produced during the course of a program. Although RCT is currently believed to be the gold standard in impact evaluation, it is important to continuously develop alternative methods. Whatever the methods used, impact evaluation is important because it can be used to demonstrate that assistance has a significant positive impact on people's prosperity. This is an important objective for IndII to achieve in each of the areas of infrastructure assistance that it provides. ■

NOTES

1. Methodologies and research results from this institution can be found here: http://www.povertyactionlab.org/
2. The Millennium Challenge Corporation (MCC). 2009. *Impact Evaluation for Mozambique's Rural Water Supply Project.*
3. Asian Development Bank. 2009. *Impact of Improved Water Supply on Water Borne Diseases.*
4. Asian Development Bank. 2011. *A Review of Recent Developments in Impact Evaluation.*
5. Japan Bank for International Cooperation (JBIC). 2006. *Jamuna Multipurpose Bridge Project (JMBP).*

About the author:

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Risk Management in Infrastructure: An Introduction

Careful management of risk is especially important in infrastructure development, where the stakes are high and not all risks can or should be completely avoided. • By Peter White

Managing risks doesn't mean avoiding them entirely. This becak driver opts for earning his livelihood despite the traffic; an organisation may likewise choose to assume certain risks in light of the payoff.
Courtesy of Annetly Ngabito

Risk is a part of life for everyone, from individuals to complex organisations. In the world of development programming, risks arise due to the nature of the work, which typically involves challenging environments, intricate contractual arrangements, and the management of multiple relationships. These risks are often compounded in infrastructure development, due to the large scale of programs and the significant levels of expenditure needed. At the AusAID funded Indonesia Infrastructure Initiative (IndII), for example, programming encompasses complex issues in the sectors of transport, water and sanitation, and policy and investment, with a reach that spans national and subnational governments and local communities.

Risk is therefore implicit in infrastructure development efforts, and it is neither possible nor desirable to eliminate all risk. Rather, the right approach is to manage risk effectively.

Risk is defined by the International Organization for Standardization, in its standards for risk management (ISO 31000:2009), as: "the effect of uncertainty on objectives". Risk management is defined as a management tool used to assess and mitigate events that might have an adverse impact on an organisation. At the same time, risk management supports sound decision-making on whether to take or avoid risks, it improves transparency of operation, and it provides a roadmap to achieve strategic goals and objectives.

The first step in risk management is an initial risk assessment that identifies layers of risk. As an example, for an embassy or mission the highest layer would most likely be identified at the country level (an example of a risk at this level would be a deterioration in relations with the host country). For a complex program like IndII, three broad layers of risk can be identified: first at the level of the facility itself; second at the component level (transport, water and sanitation, and policy and investment); and third at the activity/project level within the components.

The next steps are to determine the "risk appetite" and develop a risk profile. Establishing the risk appetite means deciding, at the highest level, what risks an organisation is prepared to take and manage to achieve its strategic objectives. A development project will be guided in its assessment of risk by the funding agency, such as AusAID. This tends to create a risk-averse culture, since an agency like AusAID is ultimately responsible and accountable for the disbursement of the Government of Australia's funds.

The risk profile identifies, assesses and evaluates key risks with respect to likelihood and consequence: how likely is it that the identified risk will occur? If it does, what will the consequences be?

Infrastructure development initiatives involve being flexible and responsive to needs that are identified within national government strategies and priorities – but at the same time executing a proactive and strategic role. This is a challenging environment that results in a higher risk profile. There are risks associated with the start-up of new activities, managing workloads, and technical risks associated with particular activities.

The Australian Standard for Risk Management (AS/NZS ISO 31000:2009) offers a risk management approach suitable for large scale infrastructure development programs, and is the basis for IndII's approach. The process outlined by this Standard is shown in Figure 1.

Key Points

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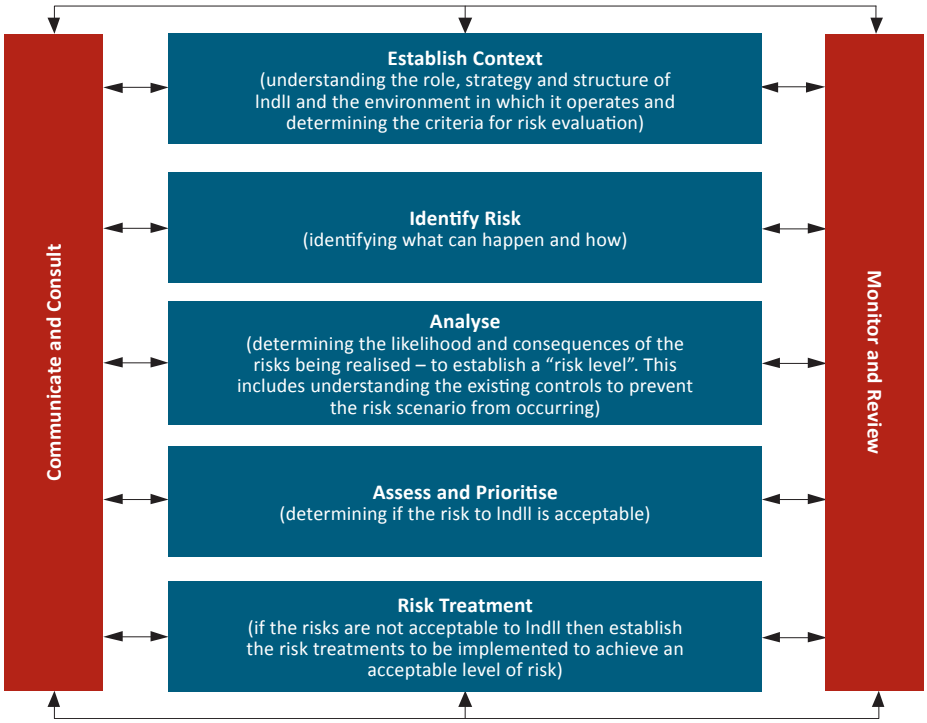
The Australian Standard for Risk Management (AS/NZS ISO 31000:2009) offers a risk management approach suitable for large scale infrastructure development programs. Steps involved are: establish the context; identify risks; conduct a risk analysis; assess and prioritise risks; develop and implement risk treatments; monitor and review risks; and communicate and consult.

When a risk management plan is developed for an infrastructure project, overall responsibility for its development and execution usually rests with the project's chief executive, with support from team leaders and technical staff. However, all personnel are responsible for identifying and managing risks.

Figure 1: Risk Management Process



Establishing the context involves defining and identifying an organisation's environments, characteristics, dependencies and stakeholders, their goals and objectives, and the scope and boundaries of the specific risk management process. Criteria are developed against which the risks will be identified and evaluated, and identified for risk management. Potential categories for an aid program delivering projects/activities include, at the program level: governance, financial, people, and communications and reporting. At the project/activity level, categories might typically include: budget, schedule, decision-making, and activity implementation.

Identifying risks is ideally done through a collaborative approach involving a wide cross section of stakeholders and recorded in a risk register. All conceivable risks, including "show stoppers", should be considered. To support this process, it will probably be useful to create categories within which risks might be identified. Once the risks (within each category) are identified, they can be documented in a risk matrix, as described in the next section.

Conducting a risk analysis entails identifying the cause of a risk, estimating the likelihood that a risk will occur, and determining the likely consequences if the risk does occur. The key output of the risk identification phase is the risk matrix. The initial risk matrix is comprised of a raw list of risks. The matrix then records the details of all the risks identified throughout the life of a project. The basic risk matrix usually includes:

- A unique identifier for each risk (for easy reference during discussion or analysis; i.e. "risk B1")
- A description of each risk event and how it will impact the project
- A standardised rating that assesses the likelihood of its occurrence and the severity consequence/impact if it does occur (Figure 2)
- Who is responsible for managing the risk
- An outline of proposed mitigation actions (preventative, i.e., to keep the risk from occurring in the first place; and contingency, i.e., to minimise the negative impact if the risk does occur)

Figure 2: Likelihood and Consequence Rating

LIKELIHOOD			CONSEQUENCE/IMPACT		
5	**Almost Certain**	Expected to occur in most circumstances	5	**Severe**	Would stop achievement of goals and objectives
4	**Likely**	Will probably occur in most circumstances	4	**Major**	Would threaten goals and objectives; requires close management
3	**Possible**	Could occur at some time	3	**Moderate**	Would necessitate significant adjustment to the overall program
2	**Unlikely**	Not expected to occur	2	**Minor**	Would threaten an element of the program
1	**Rare**	May occur only in exceptional circumstances	1	**Negligible**	Routine procedures sufficient to deal with the consequences

Assessing and prioritising risks is done by grading risks according to a combination of how likely they are to occur and how serious the consequences would be. A grade of "low risk" would be given to a risk that is both unlikely to occur and which would have a negligible impact; a grade of "high risk" would be given to a risk that is both likely to happen, and severe if it does (Figure 3).

Figure 3: Risk Level

LIKELIHOOD		CONSEQUENCE/IMPACT				
		Negligible	Minor	Moderate	Major	Severe
		1	2	3	4	5
Almost Certain	5	M	M	H	VH	VH
Likely	4	M	M	H	VH	VH
Possible	3	L	M	M	H	H
Unlikely	2	L	L	M	M	H
Rare	1	L	L	M	M	H

L	M	H	VH
LOW Risk	MODERATE Risk	HIGH Risk	VERY HIGH Risk

Tolerances
- Preferred
- Acceptable
- Undesirable
- Unacceptable

The risk matrix is then updated with information about the assigned risk levels. Figure 4 shows a sample of an element from a completed matrix.

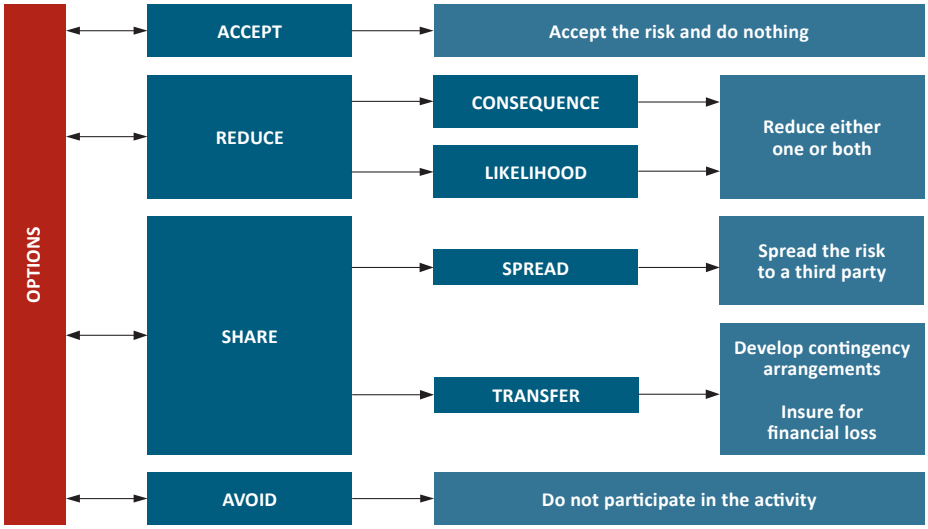
Developing and implementing risk treatments is done to cost effectively reduce, contain or control the risk. Formal risk management reporting mechanisms should also be defined at this stage. Figure 5 lays out the process of selecting options for how to deal with risk (accept the risk; reduce it; share it; avoid it) and identifying the next steps to be taken based on the option selected.

Figure 4: Sample Risk Matrix Element

ID	Risk event	Impact(s) on Program	L	C	R	Risk Treatment(s)	Responsibility
G1.	Major external event affects capacity to operate throughout Indonesia or in key geographic areas – **Avian Influenza**	Loss of staff Loss of continuity of project	2	4	M	Safety, Security and Emergency Plan (deals with this type of situation) – developed and reviewed regularly	Project Director

Monitoring and reviewing risks involves re-examining risks on a regular basis. If the mitigation strategies are effective, it should be possible to downgrade risks over time. Updates on risk should be reported to project management on a regularly scheduled basis. Ultimately, risk management is an iterative process that is built into the management processes, and is closely linked to management efforts to identify any new problems that are arising, as these can become significant risks if left untreated.

Figure 5: Risk Treatments



Communicating and consulting is important. Timely and appropriate communication with stakeholders is critical in order for the risk management process to flow smoothly.

When a risk management plan is developed for an infrastructure project, the functional owner of the overall risk management function will usually be the project's chief executive, with support from team leaders and technical staff who actively participate in the identification and management of the risk at all levels. However, at the end of the day, all personnel are responsible for identifying and managing risks and it is vital to the well being of any project or organisation that all team members take risk management seriously. ■

About the author:

Peter White is a risk management specialist, engaged by SMEC/IndII to perform and manage the development and maintenance of the IndII Risk Management Plan(s) and provide risk input, when required, on new project initiatives. He has worked in the field of project management and risk management as an independent consultant for the last 20 years, with risk assignments ranging from the IndII role, a similar role with the Transport Sector Support Program in PNG, analysis of risks and preparation of a monthly risk management report for a complex energy program and numerous risk management roles for projects ranging through Enterprise Resource Programs implementations to the project management and risk management of the transition and implementation of a unified information technology group environment. Peter is a director of Flavour Solutions Pty Ltd.

Complex Considerations: Environmental Impact Assessments in Infrastructure Development

The Governments of Indonesia and Australia both offer legislative frameworks to guide the development of sustainable infrastructure. • By Colin Millette

As a cross-cutting issue in development, the environment includes not only natural surroundings, but also people and their interactions with the systems around them.
Courtesy of CIFOR

When people in the development field talk about "environment" as a cross-cutting concern, they are referring to many complex systems: the biophysical environment, the built environment (including soft and hard infrastructure), the social (cultural) environment, and the economic environment. The definitions of "environment" used by both the Government of Indonesia (GoI) and the Government of Australia (GoA) recognise that biological and physical surroundings cannot be considered in isolation from people and their interactions with their surroundings.

The Commonwealth of Australia Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act) also views the environment in a comprehensive manner, comprising:

a) ecosystems and their constituent parts, including people and communities
b) natural and physical resources
c) the qualities and characteristics of locations, places and areas
d) the social, economic and cultural aspects of a, b or c[1].

With this in mind, infrastructure development efforts such as those undertaken by the Indonesia Infrastructure Initiative (IndII) must regard the environment as a holistic and integrated system. As a program funded by AusAID and working in partnership with GoI, IndII is obliged to follow both GoA and GoI legislative frameworks and the international agreements or conventions signed by both countries. The EPBC Act 1999 is the legislative basis for environmental protection and management in Australia. In Indonesia, several pieces of legislation provide for environmental management; notably, Act no. 32/2009 on Environmental Protection and Management; Government Regulation no. 27/1999 on Environmental Impact Assessment; and the Regulation of the Minister of Environment no. 05/2012 on Types of Business and/or Activities Requiring Environmental Impact Assessment[2].

Taken together, these legislative frameworks outline a number of environmental and social safeguards that infrastructure development activities must institute using an Environment Management System (EMS). For example, the EMS followed by IndII is called the Environmental Compliance and Environmental Management Process, also known as ECOMAP. The ECOMAP aims to ensure an appropriate integration of environmental awareness into all aspects of IndII activities, so that the relevant regulations, policies and strategies of GoA, GoI and AusAID can be met. The ECOMAP is also intended to assist IndII to fulfill its legislative environmental obligations as a facility operating under AusAID and GoI.

It is not the intent of this article to focus on ECOMAP, but it does provide a useful illustration of how environmental assessment can be managed in the context of infrastructure development. ECOMAP is intended to provide IndII team members and consultants with the tools to: (i) identify, access and manage actual or potential environmental impacts; (ii) avoid or mitigate negative impacts and promote positive impacts; and (iii) report regularly on impacts. The main focus of the ECOMAP is the recording of the decision-making processes associated with exercising due diligence to ensure that IndII activities integrate environmental and social safeguards – safeguards that are necessary to meet legal obligations under Indonesian and Australian law as well as multilateral agreements signed by the two countries. It was

Key Points

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The need for sustainable environmental management is based upon the assumption that human societies and individuals are an integral part of the surrounding ecosystem, and that management is sustainable only if both the human condition and the condition of the ecosystem (and built systems) are not compromised beyond repair. An environmental impact is any direct or indirect change to the environment, whether negative or positive, wholly or partly resulting from an activity. The assessment of environmental impacts can be undertaken at three levels: the country level; the macro regional, sectoral or policy level; and the project or activity level.

EIA involves predicting and evaluating the likely impacts of an activity, including cumulative impacts on the environment as a whole, during construction, commissioning, and operation, as well as after operations conclude. The Indonesian EIA process experiences challenges due to a number of factors, including: varied levels of understanding at the provincial level; varying capacity of firms to conduct EIAs; the importance of public consultation; the evolving rigour of assessments in social impact; emerging issues in climate change; environmental enforcement; and political influences on the process.

developed on the assumption that IndII could be collaborating on projects across the full project cycle. Although it describes possible sectoral scenarios to highlight some procedures, ECOMAP takes a broader approach and does not focus upon specific activities with which IndII may become involved. ECOMAP involves five components of the project cycle, with a key focus of IndII activity happening in the second component, "Conduct Environmental Assessment and Planning" (see Box 1)[3].

The environmental assessment framework in Indonesia is comprehensive and relatively similar to the environmental assessment framework of GoA. It accommodates the environmental and social safeguards associated with other international agencies such as the World Bank, Asian Development Bank and the United Nations.

Box 1: Environmental Compliance and Environmental Management Process (ECOMAP)

1. Understand the Policy and Legal Setting
2. Conduct Environmental Assessment and Planning
   i. Develop strategic plans in AusAID–IndII
   ii. Design aid activities
3. Implement
4. Monitor and evaluate
5. Ensure continual improvement

Defining Sustainability

The need for sustainable environmental management is based upon the assumption that human societies and individuals are an integral part of the surrounding ecosystem, and that management is sustainable only if both the human condition and the condition of the ecosystem (and built systems) are not unacceptably compromised. Environmental and social safeguards are applied to ensure that biological diversity is not reduced and ecological processes and social or economic systems are not damaged beyond repair. If the ecosystem or human condition is poor or worsening, then society's activities and its systems may be considered unsustainable. Sustainable development can be defined as improving the quality of life while living within the carrying capacity of supporting ecosystems[4].

An environmental impact is any direct or indirect change to the environment, whether negative or positive, wholly or partly resulting from an activity. Environmental impacts may involve "cumulative" or "combined" changes to the environment. These can result from multiple activities or a sequence of activities or stresses in an area or sector. With respect to GoA, a "significant environmental impact" refers only to a significant negative environmental impact. This means negative environmental impacts must be considered in isolation from any net or overall benefit of the activity. GoI also places an emphasis on negative impacts, and determines their significance based on magnitude, scale (size of the area affected), duration, intensity, other environmental components affected, the nature of cumulative effects, and irreversibility/reversibility.

Evaluating Impacts

The assessment of environmental impacts can be undertaken at any of three levels: the country level (a Country Environmental Impact); the macro regional, sectoral or policy level (a Strategic Environmental Assessment, or SEA); and the project or activity level, known as EIA/AMDAL. The SEA involves assessing broad environmental issues in order to improve the quality and efficiency of subsequent environmental assessments. The SEA can help to identify links between poverty and the environment at the regional, country or program level.

Environmental Impact Assessment (EIA) involves predicting and evaluating the likely impacts of an activity, including cumulative impacts on the environment as a whole, during construction, commissioning, and operation, as well as after operations conclude. It includes designing appropriate preventative, mitigating and enhancement measures that address these impacts in order to protect environmental and community welfare. These mitigation measures are captured in the environmental management plan, known in the Indonesian context as Rencana Pengelolaan Lingkungan Hidup. The environmental monitoring plan (Rencana Pemantauan Lingkungan Hidup) is used to track its implementation.

All IndII proposed activities must be screened to identify environmental issues and potential environmental impacts. This initial environmental assessment is fundamental to ensuring that all activities can comply with both the Australian EPBC Act and Indonesian Government Regulation no. 27/1999. An initial environmental assessment should ideally occur during activity identification and initial assessment and it must be done no

later than the preliminary stage of activity preparation. This initial assessment involves answering the screening questions shown in Box 2. Depending on the answers, the next step can be a sector-level SEA or a project level EIA.

GoI Act no. 32/2009 requires an SEA for spatial plans and mid and long term development plans and policies. The requirement for an EIA is established by GoI Government Regulation no. 5/2012, which identifies a variety of activities and sets criteria for determining whether these activities require an EIA. If the proposed activity is deemed "new" and does not trigger an EIA under GR 5/2012, but it has the potential to create environmental impacts, two reports are required: an environmental management report (UKL) and an environmental monitoring report (UPL). These documents are created during the planning phase of an activity/undertaking as a requirement for obtaining licenses/permissions. The contents of these reports can be incorporated into the required Pre-feasibility Study Report. If the proposed activity is deemed a "continuing activity" of an undertaking that does not have environmental management documentation or reports, an environmental audit is required. The EIA and environmental permitting process is shown in Figure 1.

Box 2: Environmental Screening Questions

Strategic planning screening questions

Q1. Is the initiative likely to take place in a vulnerable location or risky sector?

Q2. Is the initiative likely to have a significant negative impact on the environment?

Q3. Is a SEA of the initiative (including policy, program, portfolio, country or regional strategy) planned?

Aid activity design screening questions

Q1. Will the activity take place in a vulnerable place or risky sector?

Q2. Could climate change or natural disasters impact on the activity?

Q3. Could the activity impact on ecosystems that sustain livelihoods?

Q4. Could opportunities to build resilience be incorporated?

Q5. Could the activity have a significant impact on the environment, including increasing greenhouse gas emissions?

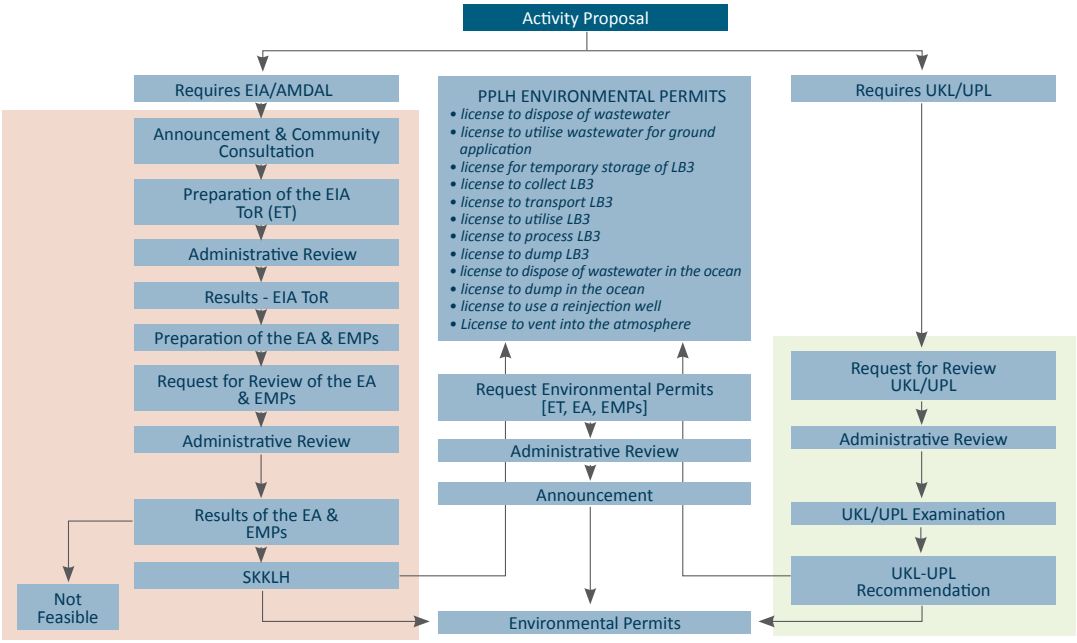
Challenges

As with many frameworks of its kind, the Indonesian EIA process experiences challenges due to a number of factors. These factors include:

The varying degrees of understanding of the EIA process at the provincial level. The capacity to provide oversight, guidance and education on the EIA process varies among provincial and regional environment protection agencies/offices and relevant line agencies. Some environment protection offices are well equipped with technical expertise and staff while others are less capable. Similarly, line agencies vary in their awareness of their roles and responsibilities in the EA process. This may be related in part to the capacity of the regional environment protection office. The Ministry of the Environment strives continuously to support regional offices through technical assistance, program/legislative socialisation, and other capacity-building initiatives.

The varying capacity of national private sector firms to conduct EIAs with a degree of rigour that satisfies international standards. The private sector is responding to the rising demand for EIAs that meet international standards. Examples of reporting done to international standards that are related to IndII's work include the Losari Beach Wastewater Treatment Plant Impact Assessment and the Jatiluhur-to-Jakarta Pipeline and Water Treatment Plant Stage 2a. The Ministry of the Environment has made efforts to establish standards for EIAs by enacting legislation requiring EIAs to be produced by EIA practitioners from a national registry that establishes a minimum threshold for the quality of EIA work and reviews. Both national and international practitioners are required to register.

Figure 1: Government of Indonesia's Environmental Impact Assessment Licensing and Environmental Permitting Process



Key:
EA = Environmental Assessment
EIA/AMDAL = Environmental Impact Assessment
EMP = Environmental Management Plan
ET = EIA Terms of Reference
LB3 = *Limbah Bahan Beracun dan Berbahaya*, toxic and dangerous waste
PPLH = Perlindungan dan Pengelolaan Lingkungan Hidup (Act No. 32/2009 on Environmental Protection and Management)
SKKLH = Surat Keputusan Kelayakan Lingkungan Hidup, the Decision Letter on Environmental Feasibility
TOR = Terms of Reference
UKL = environmental management report
UPL = environmental monitoring report

The importance of public consultation. Proponents of infrastructure projects must be prepared to solicit and appropriately incorporate input from the public in a variety of settings, whether it is within a community where education levels are limited or in a situation where public opinion is galvanised over the proposed development. The perspectives of those who are often not consulted, such as women and vulnerable groups such as the poor, also need to be obtained. Transparency, traceability and reasoned decision-making in the EIA process are hallmarks of good practice.

The evolving rigour in the assessments of social impacts. Social impact assessment as a specialised field in EIA, continues to evolve as new approaches are developed, borrowing techniques from social science research and participatory action research.[5] Furthermore, social impact assessments need to be gender sensitive and ensure that impact on groups who are disadvantaged or outside the mainstream, such as indigenous peoples, are assessed.

Emerging issues in climate change. Emerging issues on climate change also call for up-dated mechanisms and assessment protocols.

Environmental enforcement. Act no. 32/2009 on Environmental Protection and Management is the principle tool for environmental enforcement and sanctions. The extent to which it is being enforced varies throughout the archipelago, and issues surrounding its implementation continue to arise. Most recent is the case in Aceh regarding the Tripa peatlands, involving license-issuing and land-clearing violations that will likely result in litigation.

Political influences on the EIA process. In an ideal situation, due diligence, good governance and transparent decision-making processes minimise the impact of political influence on environmental safeguard decisions and lead to accountability. This is a difficult ideal to achieve anywhere in the world, but GoI is working to achieve it with assistance from partners who provide technical assistance and guidance in due diligence. ■

NOTES

1. EPBC Act. 1999.
2. Formerly Regulation of the Minister of Environment no. 11/2006 on Types of Business and/or Activities Requiring Environmental Impact Assessment.
3. IndII, 2011, Environmental Compliance Strategy and Environmental Management Process (ECOMAP) Manual.
4. AusAID, unpublished, *Environmental Management Guide for Australia's Aid Program 2011*, unofficial revised version, AusAID, Canberra.
5. Action research is an interactive inquiry process that balances problem solving actions implemented in a collaborative context with data-driven collaborative analysis or research to understand underlying causes, enabling future predictions about personal and organisational change (Reason & Bradbury, 2002). Source: http://en.wikipedia.org/wiki/Action_research

About the author:

Colin Millette is an environmental planner and program evaluation specialist with over 20 years of experience managing and implementing field projects for technical assistance programs in capacity building, environmental management, program evaluation, and sustainable community development. He is familiar with UNDP, CIDA, AUSAID, World Bank and ADB protocols from a variety of long and short term assignment work. His areas of specialisation include Environmental Impact Assessments and Social Impact Assessments (involving linear infrastructure projects, e.g. roads/superhighways, transmission lines, water infrastructure and municipal operation facilities); and program evaluations (participatory evaluations, mid term and impact evaluations, and institutional capacity assessments). Mr. Millette holds an advanced degree in Rural Planning and Development, is a skilled negotiator in alternative dispute resolution, and translator of Bahasa Indonesia.

Safe and Comfortable Public Transport for Everyone: A Goal in Progress

Indonesian laws affirm the right of women and other vulnerable groups to access public transport. Better data, analytical tools, and capacity development will help Indonesia make this goal a reality. • By Eko Setyo Utomo

The women's section of a Transjakarta bus travelling along Jl. Sudirman
Courtesy of Eleonora Bergita

Public transport is a strategic sector in development. Everyone has the right to expect comfortable, safe, and affordable transportation, including people with special needs, such as women, children, the elderly, and the disabled.

Adequate transportation facilities can be achieved best when the development process takes into consideration the circumstances and needs of both men and women, as well as of those with special needs. This approach has been affirmed by the Indonesian government through Presidential Instruction (Inpres) no. 9/2000 on Gender Mainstreaming in National Development. As defined in this Inpres, a gender mainstreaming strategy integrates a consideration of gender into planning, developing, implementing, monitoring, and evaluating national development policies and programs. The ultimate goal is to ensure that development processes engage and provide benefits to all groups of society, regardless of gender. Transportation is no exception.

Gender responsiveness in transportation may be viewed along three dimensions: physical infrastructure; provision of services; and the development of policies, standards and operating procedures. These dimensions can be assessed in terms of several performance criteria, including suitability, regularity, frequency, timeliness, affordability, access, safety, speed, and integration with other transport modes[1]. These criteria apply to land, air, and sea transportation.

Problems Not Addressed

In practice, gender concerns have not been effectively addressed in public transport systems. Many of the services available, particularly for land transport, fall short in terms of flexibility, comfort, and security. Jostling in overcrowded city buses and trains is a daily phenomenon in many cities. The

consequence is that comfort and security are disrupted. In this situation, women are the most vulnerable group[2]. Sexual harassment and even rape often occur in public transportation. In 2011 the National Committee of Women reported that from 2008 to 2011, 22,284 cases of sexual harassment in public places were recorded, most of them in public transportation.

Other groups such as the elderly and disabled also find that their needs are not being met. Public facilities sensitive to the disabled, elderly people, children, and pregnant women are still limited in number.

The design of many buses in Indonesia is inconvenient for female passengers and other vulnerable groups because the step at the entry/exit is too high. The handrail on the Transjakarta buses for standing passengers does not take into account the average height of an Indonesian, particularly women, who are generally shorter than men.

Rail transport also presents problems. Platforms where passengers get on or off the train do not match the height of the train itself, making access more difficult. Passengers often have to jostle to get on the train, especially during rush hour, which increases vulnerability to sexual harassment.

Policies and Initiatives

There are at least four laws addressing the needs of women and vulnerable groups when using public transport: Law no. 1/2009 on Aviation, Law no. 17/2008 on Shipping, Law no. 23/2007 on Railways, and Law no. 22/2009 on Traffic and Road Transport. The special means and services described in these laws must be provided free of charge.

Transport policies that take gender into account are starting to be implemented at the national level and in several regions. An example is the provision of special train cars in Jakarta and surrounding areas for

Key Points

Everyone has the right to expect comfortable, safe, and affordable transportation, including people with special needs, such as women, children, the elderly, and the disabled. The circumstances of such groups must be taken into account in order to develop adequate transportation facilities. This approach has been affirmed by the Indonesian government, which has a formal gender mainstreaming strategy.

Gender responsiveness in transportation (whether land, sea, or air) involves physical infrastructure; provision of services; and the development of policies, standards and operating procedures. Success can be assessed in terms of performance criteria such as suitability, regularity, frequency, timeliness, affordability, access, safety, speed, and integration with other transport modes.

In practice, gender and similar concerns have not been effectively addressed in public transport systems. Sexual harassment and even rape are problems. Public facilities that accommodate the needs of the disabled, elderly people, children, and pregnant women are still limited.

The Ministry of Transportation (MoT) has taken several steps, such as establishing a Working Group (Pokja) on Gender Mainstreaming. The Pokja has issued guidelines, conducts training, and is working with the Ministry of Women's Empowerment to improve collection of data disaggregated by sex.

Challenges include lack of capacity and will; a need for better understanding of analytical tools; staff turnover; and availability of data. All stakeholders should support MoT in overcoming these difficulties and in pursuing progressive initiatives, such as surveys of public perceptions, public campaigns about the right to safe travel and making it easier for victims to report violations to the police.

women travelling on short distance economy class trains. On Transjakarta buses, separate spaces have been designated for female and male passengers. These are small steps in the right direction, but the vast number of passengers means that much more must be done to meet expectations for accommodating the needs of women and other groups.

Implementation of Inpres no. 9/2000 requires political commitment by regulators, effective policy and institutional support, adequate human resource capacity, relevant analytic tools, the availability of data disaggregated by sex, and support from the wider community. In this context, the Ministry of Transportation has taken several steps, such as establishing a Working Group (Pokja) on Gender Mainstreaming at the Ministry of Transportation (as stipulated by Decision Letter of the Minister of Transportation no. 50/2009). The members of this Pokja represent all directorates. They are expected to coordinate and advocate on matters of gender in their respective areas. A tool for analysis, in the form of Guidelines for the Integration of Gender Aspects in Planning and Budgeting, has been made available through collaboration with the Ministry for Women's Empowerment and Child Protection. Training to build capacity on gender mainstreaming has been conducted by the Ministry of Transportation and is ongoing. An initiative to develop the needed disaggregated data is also being designed with support from the Ministry of Women's Empowerment.

Voices from the Bus

Transjakarta buses provide a special section for women, a move that is surely welcomed by many loyal users. Prakarsa asked several female users of varying backgrounds about their thoughts on whether Transjakarta is meeting the needs of the women who use this mode of public transport.

The low fare and the bus routes that extend to all corners of the city are the primary reasons why the bus appeals to many users. Amalia, a 19-year-old college student; Chika, a 15-year-old high school student; and two employees in the private sector, Wati (age 44) and Kurnia Rhidowati (33) all prefer using Transjakarta to travel between home and school or the office. Chika says she doesn't know the routes that other forms of public transportation follow. For Kurnia, who is in a wheelchair, the Transjakarta bus is her only option.

According to Kurnia, whose office is in the Melawai area of Kebayoran Baru, South Jakarta and whose home is in Grogol, West Jakarta: "Compared to other public transportation, the Transjakarta bus provides me with a greater possibility to travel by public transportation. The reason is that the spaces between the bus stop doors and the busway doors allow my wheelchair to pass. Also, several Transjakarta bridges are only slightly inclined, such as in Grogol and Harmoni, which makes it easy for me to cross in a wheelchair."

Female passengers say they enjoy the provision of a special section for women on the bus. They feel more comfortable because they do not have to jostle with male passengers. Although they have chosen the Transjakarta bus as their primary means of transportation, they also mention some complaints. Amalia has missed lectures in Kebayoran Baru several times due to a late-arriving bus. Another complaint is crowding on the bus. Says Chika, "Even when the bus is full, passengers are still allowed to enter, which often makes it hard to breathe. In addition, although there is a special section for women inside the bus, we still have to jostle with male passengers while waiting for the bus to come."

Safety is also a concern. Chika was once stalked by a man while she was on the bus, and for safety reasons had to exit at a stop that was not her destination. Kurnia once saw a fellow passenger being pickpocketed on the bus, and she herself was robbed on the bridge at a Transjakarta bus stop. Lights on the bridges leading to Transjakarta stops would be a big help to prevent crimes such as the one she experienced, says Kurnia.

As a disabled bus user, the matter of physical infrastructure is also a major issue for Kurnia. Most of the bridges and bus stops of the Transjakarta system are not accessible to the disabled, due to factors such as steep stairs.

Whatever their complaints, riders like Kurnia, Chika, Wati and Amalia still faithfully use the Transjakarta bus, while hoping that someday this mode of transportation will become more accommodating. —*Eleonora Bergita*

Challenges

Developing systems that fully take gender concerns into account is an ideal that requires serious efforts to achieve, particularly in a sector such as transport where many decision makers are male. The magnitude of the challenge is no doubt why the laws and regulations have yet to be fully implemented. A sustained effort will be needed to overcome the constraints to accomplishing gender mainstreaming. These constraints include:

- Lack of capacity, and will, to implement policies regarding gender.
- A need for greater understanding and mastery of methodological and analytical tools that support gender-oriented planning.
- Transfer and replacement of government officials. This turnover means that investment in capacity building on gender often produces minimal returns due to lack of continuity of effort from the old to the new official.
- The availability of data disaggregated by sex is still limited and has therefore made little contribution to planning, despite government acknowledgement of the need for quality data.

Efforts by the Ministry of Transportation to implement gender mainstreaming should be supported and developed by other stakeholders. Constraints such as inadequate commitment and understanding deserve serious attention to improve planning and implementation. Policies and implementing guidelines need to be developed to elucidate the meaning of the laws on the provision of transport facilities and services to vulnerable populations. A database for transport must be developed, with data sorted by gender and other relevant characteristics.

Another aspect that needs to be addressed more seriously is protecting women from harassment and violence while using public transport. Segregating males and females may help but it is ineffective when the spaces set aside are not in balance with the number of passengers. Other progressive efforts are needed, such as public campaigns about the right to safe travel and making it easier for victims to report violations to the police.

Another valuable initiative for improving gender mainstreaming is to study people's perception and satisfaction levels regarding available public transport services. This should include surveys to focus on special groups such as the elderly, disabled, children, and pregnant women.

Gender mainstreaming efforts in transportation need continuous support, coordination, and collaboration among institutions and stakeholders to achieve the goal of comfortable, affordable, and safe transportation facilities and services for everyone. The goal is not simply to fulfill the law, but to create a reality that will have a positive impact on all users of transportation means and services. ■

NOTES

1. Guidelines on the Integration of Gender Aspects in the Planning and Budgeting of the Ministry of Transportation.

2. Gender and Urban Transport; Fashionable and Affordable. Module 7a. *Sustainable Transport: A Sourcebook for Policy Makers in Developing Cities.* GTZ and the Federal Ministry for Economic Cooperation and Development.

About the author:

Eko Setyo Utomo is IndII's Gender Mainstreaming Officer. He has spent the last decade working on issues related to gender mainstreaming and anti-trafficking. Prior to joining IndII he was affiliated with a project operated by the International Catholic Migration Commission on Cross-Border Indonesia-Malaysia Anti Trafficking in Persons. His other positions include being Executive Director of the *Institut Hak Asasi Perempuan* (Centre for Women's Human Rights Advocacy), Team Leader of the City of Yogyakarta's Gender Mainstreaming Team, and Policy Advocacy Coordinator at the Indonesian Women's Coalition for Justice and Democracy, Yogyakarta Region. He has also done independent consulting on gender mainstreaming, program evaluation, and other topics for local and international development organisations. He is a graduate of the Syari'ah (Islamic Law) Faculty at Sunan Kalijaga Islamic University.

A System That Can Save Lives

A new system is being introduced in Central Java to improve the collection and management of road crash data. This will lead to a better understanding of road safety problems and eventually to interventions that will save lives throughout Indonesia. • By M. Naufal Yahya, M.Sc.Eng

Last year more than 32,000 people were killed in road crashes throughout Indonesia. Every day almost 100 people are killed and thousands more injured on Indonesian roads. The Government of Indonesia has committed to countering this huge human and economic problem as part of its agreement to the UN-proclaimed Decade of Action for Road Safety, which began in 2011. However, in order to design effective solutions to Indonesia's road safety problem, it is first necessary to obtain reliable and detailed information about road crashes.

When crashes occur, they can be the result of many contributing factors, including the condition of the road, driver behaviour, the state of the vehicle, the traffic situation and the weather. Many institutions are involved in interventions to improve road safety, such as the National Police, the Directorate General of Highways in the Ministry of Public Works, the Ministry of Transportation, the Ministry of Health, and a number of non-governmental organisations. All of these stakeholders require detailed and reliable data relevant to their sector so that they can identify the most effective strategies to reduce the occurrence and severity of crashes.

A New System

Data on road crashes are collected by the Police. In order to improve the quality and reliability of data they obtain, a new system called the Integrated Road Safety Management System (IRSMS) is being implemented. The system introduces a new, easy-to-fill-out form that police officers use at the site of the crash along with cameras equipped with GPS (Global Positioning System) technology.

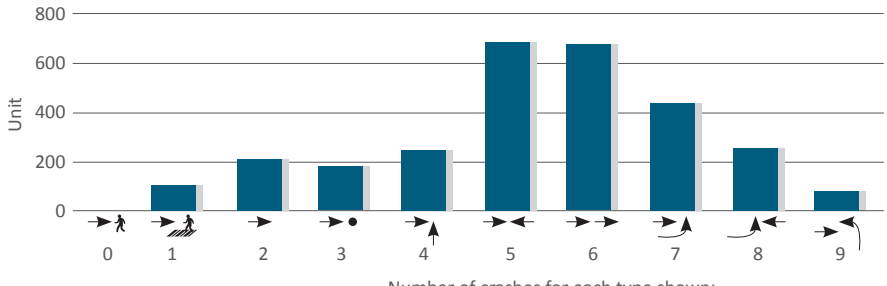
To fully understand the cause of a crash and determine what actions will prevent similar crashes in the future, it is imperative to know exactly where the crash took place. Just knowing the name of the road on which the crash occurred or a building near the site is not sufficient to identify the spot and thereby determine if factors related to the location played a role in causing the crash.

The new cameras that police officers will use will not only provide photographic evidence but will also record the geographic coordinates of the site with a typical precision of 5–10 metres. With the coordinates and photos as a guide, it is no longer necessary to record other location information while at the crash site.

Back at the police station, the information will be registered in a database. The database and software are located at the National Traffic Management Centre of the National Police and can

be accessed over the internet. All that anyone needs to access the system are a computer, browser, and Internet connection – and a valid password, of course! A user interface with tick boxes and drop-down menus makes it easy for the operators to register all the details of the crash.

Figure 1: Most Common Types of Crashes, Central Java, January and February 2012



Year	Number of crashes for each type shown:									
	0	1	2	3	4	5	6	7	8	9
2012		106	212	182	249	687	677	439	256	

Indonesia Police © 2012

When photos are transferred from the camera into the database, the geographic coordinates are stored automatically and the crash location can be displayed using Google Maps. The site of the crash can be adjusted by simply dragging the marker of the crash to the correct position. The name of the road is automatically transferred to the database as well.

Information needed for legal proceedings can also be entered into the system, and documents needed for court can then be generated.

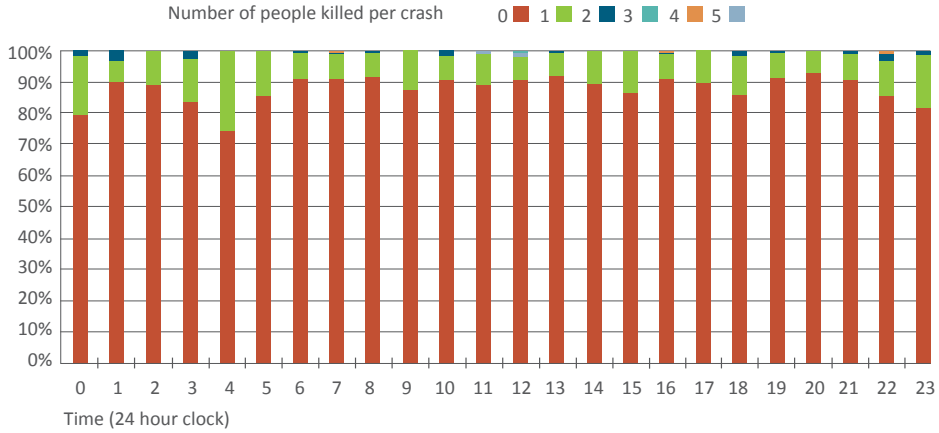
To enhance the level and detail of information, the crash database is integrated with three other government databases: drivers' licenses, vehicle registration, and traffic violations. This additional information on the driver and his vehicle will automatically be included in the crash report generated by the IRSMS.

Analytical Reports

The stored data can be used for a variety of purposes beyond the generation of individual crash reports. The system can generate weekly and monthly summaries of crashes in a district or province. These are available as graphic presentations that give a quick overview of the situation. For example, Figure 1 shows the number of crashes in Central Java, broken down by type, during the first two months of 2012. It is clear that head-on collisions and rear-end collisions are the two most frequent types.

In addition to the standard tables available, the system allows data to be cross-tabulated on a custom basis. This means that any pair of parameters can be displayed in a table. For example, Figure 2 illustrates how many people are killed at different times of the day. It shows that during the day about 10 percent of crashes involve fatalities, whereas in the night and early morning this goes up to around 20 percent.

Figure 2: Number of Fatalities Per Crash by Time of Day in Central Java January and February 2012



The system can also generate maps that graphically depict the number and location of crashes, as shown in Figure 3.

Users can zoom in on the map to see data on individual crashes at higher resolutions (see Figure 4). This feature enables the identification of sites where many crashes occur. When the user clicks on a crash site, a balloon will appear showing basic information, the crash diagram and a thumbnail picture from the site. Additional photos from the scene can be accessed by clicking on the thumbnail.

When a problem site is identified, special reports for the crashes that occurred there can be produced that allow users of the system to easily identify common factors for the crashes at that particular site.

Access for All

As noted, actions for improving road safety must be undertaken by many different organisations. The intention is that all stakeholders should have access to information that will enable them to analyse how they can best design interventions to prevent or lessen the severity of future crashes, whether this is done by improving signage, conducting an education campaign, or stepping up enforcement of traffic laws.

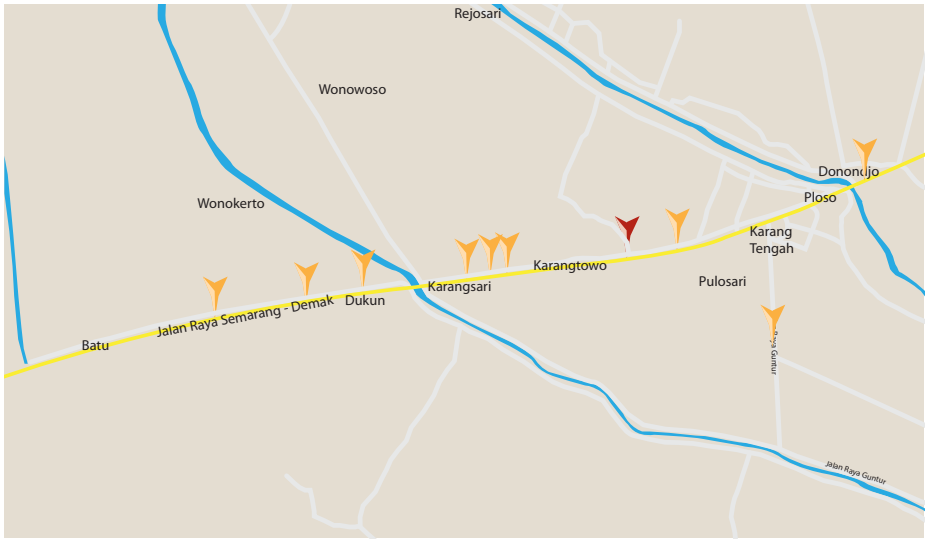


Figure 4: Detail of Map Showing Crashes in Central Java, January and February 2012

In the database there is sensitive information, such as the name of drivers. The system has therefore been designed with different levels of access, so that only police officers at the National Police level have access to all the information, and other stakeholders can only view less sensitive data.

The system is now ready for testing in Central Java Province and four other selected areas on Java. After a thorough test and possible adjustments it will be decided how the system will be implemented all over Indonesia. The hope is that in the long run, this system will make a significant contribution to saving lives. ■

About the author:

M. Naufal Yahya is Director of the Traffic Police in Central Java Province. He is presently responsible for the implementation of the Integrated Road Safety Management System, which is a World Bank financed project that will improve and integrate police databases.

The Expert View

Question: *How significant do you think gender concerns are in the context of Indonesian infrastructure development? What professional and/or personal experiences have shaped your views on this subject?*

Dr. Elly Sinaga

Director of Urban Transportation System Development
Directorate General of Land Transportation, Ministry of Transportation

"Land transportation has many gender-related implications, so it is important to focus on gender issues. Law no. 22/2009 on Road Transport Traffic contains a provision on the needs of women, pregnant women, and the disabled. Every chapter of the law has articles that stipulate that all facilities and infrastructure shall be operated and procured with differing capabilities in mind. Regarding the less than ideal conditions of sidewalks, we are gradually making efforts to improve the infrastructure conditions for pedestrians on all national roads, because walking is a basic human right. Regarding public transport, there is a Minimum Services Standard (SPM – *Standar Pelayanan Minimal*), which among other provisions specifies the maximum capacity of buses. Such provisions are often violated, causing inconvenience to passengers and making it easier for sexual harassment or other crimes to occur. We're also addressing conditions at bus stops, where high platforms cause problems for women, the blind, and those using wheelchairs.

In addition, the Integrated Transport System (ITS), which is currently being heavily promoted in many cities, can improve safety, security and access to transportation for women. For example, the ITS uses an information system that integrates traffic lights with a control centre and allows us to review the condition of busses and terminals. This system, which makes people feel safer, is already in place in Bali and Solo. Another way we can prevent dangerous situations is to install a danger signal visible from the outside of public transport vehicles, so that the police can immediately take action when they see the signal. Actually, we are developing many strategies at the moment. We are making efforts to encourage local governments to recognise the condition of their land transport infrastructure and rectify problems."

Ir. Rina Agustin, MURP

Head of Sub-directorate for Technical Planning, Directorate for Developing Healthy Settlement Environments (PLP), Directorate General for Human Settlements, Ministry of Public Works

"After participating in training and discussions on gender mainstreaming, at both the Secretariat for Gender Mainstreaming at the Ministry of Public Works and during the training organised within the ADB, I realised that this topic is very important in the development of infrastructure. Furthermore, when we did an evaluation we wondered why several sanitation facilities we constructed were not used. After investigating, we found out that the majority of potential users were women and they were not familiar with these facilities. It also turned out that the facilities were not women-friendly, i.e. they did not fully accommodate women's needs, such as providing a space to leave their children or their shopping while they were using the facility. Now I understand that gender concerns are not just about whether women

should participate in meetings, but more about considering and fulfilling their needs. We are now starting to implement this within the Directorate of Environmental Sanitation. On a daily basis, starting from planning the budget, we include consideration of women's needs. In a sanitation development project using a loan from the ADB, we also organised a training session on gender issues for the facilitators, and made available our expert staff members who are handling gender issues. We also do socialisation of gender issues, and educate our field officers and provide them material during every meeting. We always remind them to listen to and involve women and the elderly in discussions."

Rita Herlina

Head of Sub-Directorate for Regional Grants
Directorate General of Fiscal Balance, Ministry of Finance

"Gender issues don't have a direct impact on infrastructure projects financially managed by the Ministry of Finance. Our directorate is responsible for managing grants and the projects are already designed and approved by other relevant ministries. However, during Sri Mulyani's time as the Minister of Finance, she gathered her female colleagues and inspired them to take up more leadership roles. Sri Mulyani is a visionary and believed women shouldn't be stereotyped and should be given equal opportunities. For example, a woman is usually selected as the head of a financial bureau because of the perception that women pay more attention to details and therefore are more suitable for administrative work. This is not correct, men can also do administrative jobs and women can be in positions where more strategic thinking is involved.

The legacy is continuing now under Minister Agus Martowardojo. There are more women working at the Echelon 3 level then there were before. I sit on a recruiting board and I believe the process has improved. Women who are qualified for a certain job are ensured an interview.

The problem is now more to do with the individual herself. Because of their basic nature, women are bound to become mothers and take care of their family. Some women in the Ministry have actually been offered a higher level job but they turned it down due to family commitments. It is harder for a woman to stay late after office hours and go on business trips than it is for a man."

Rien Marlia, ST, MT

Head of Section for Financing and International Cooperation
Directorate General of Highways

"Any infrastructure development initiative that does not fully consider gender issues during its development, preparation and implementation phases will not meet its potential to achieve a better outcome for women. Families at the lower end of the economic scale can benefit greatly from projects like EINRIP (the AusAID funded Eastern Indonesia Road Improvement Project) that offer improved access to areas for buying and selling goods. This is especially crucial for households headed by a female. Other benefits of infrastructure development that can be especially significant for women and girls are better access to schools, health care, and clean water, and improved opportunities to participate in decision making.

EINRIP has a reasonably good record with respect to the participation of women in the early phases of the project. Some women are actively participating in the development and implementation phases of the project; however, the overall gender balance is still tilted towards men. EINRIP's impact on gender issues has been mixed so far, in my view. However, it has been heartening to see some women pursue engineering related fields in projects such as these. And at the national Government level, more women are playing more active roles in infrastructure projects.

Indonesia is a fast growing economy and this rapid growth should not be limited to one gender or community only. Out of an estimated world population of 7 billion, females constitute 45–52 percent depending on the age group. It is difficult to imagine any concrete development goals being met without consideration of gender issues."

Ambar Muryati, SE, MM

President Director of the Klaten PDAM (local water company)

"Infrastructure development in Indonesia cannot be separated from the role of gender because the majority of the Indonesian population consists of women. Particularly in developing infrastructure to provide access to clean water, women play a dominant role in influencing how clean water is utilised, because every day women are in touch with water. However, women do not yet have a significant role in making policies, because there is not a large number of female government officials in infrastructure development. Whenever I head a program's socialisation team, I always take advantage of the PKK [*Pemberdayaan Kesejateraan Keluarga*, Family Empowerment and Welfare] meetings at the local level to promote the issue. We did the same thing when we were going to increase tariffs – we arranged a customers' gathering through a women's PKK meeting and obtained optimum results. On the PDAM Klaten team, there are a few other managers besides me who are women, such as the head of the finance department, the head of the Internal Inspection Unit, and the head of the warehouse. Almost all of their assignments are completed on time with quite good results."

Outcomes:

Special Railways Regulations Issued

Indonesia has an abundance of natural resources. Exploiting these resources will help drive economic growth. However, the ability to do so depends in large part on the availability of means to bring natural resources to market. In many cases, railway transportation can play a vital role.

To foster private investment in the Indonesian railway sector, the Government of Indonesia (GoI) is committed to facilitating railway development and supporting the expansion of Indonesian extractive industries and related enterprises. Indonesian enterprises (particularly coal mine operators) have welcomed GoI's interest and advocated for a regulation dealing specifically with the Special Railways (SR) that transport natural resources. The Ministry of Transportation undertook the formulation of an SR regulation within the legislative framework of Indonesia's Law no. 23/2007 on Railways, with assistance from the AusAID funded Indonesia Infrastructure Initiative. This resulted in the issuance of Ministerial Regulation no. 91/2011 on 31 October, 2011, which is helping to facilitate private investment in the railway sector. The company, MEC, is breaking ground in East Kalimantan, while Bukit Asam Transpacific Railway hopes to break ground in South Sumatera before the end of 2014. Other investors are showing interest as well; for example a group of Russian investors recently signed an MOU with the Governor of East Kalimantan.

In Our Next Issue: Output-Based Aid

Output-based aid (OBA) is a promising new modality for development programming that links the delivery of public services to targeted performance-related subsidies: for example, a local government (LG) will receive a subsidy after demonstrating that it has reached specified, measurable goals. Working closely with the Ministries of Finance and Public Works, the AusAID funded Indonesia Infrastructure Initiative (IndII) has been at the forefront of pioneering OBA in Indonesia, through the design and roll-out of the successful Water Hibah program during IndII Phase 1. Water Hibah is a A$20 million subsidy program that incentivised LGs to expand their piped-water networks to an additional 77,000 low income households and sewerage to 5,000 households. In Phase 2 of IndII, similar OBA grant programming will be used to incentivise improved LG service delivery in other sectors, including local road maintenance, road safety, urban mobility, sanitation, and community water. In each instance, subsidies will be conditional on meeting criteria such as governance reforms and matching fund requirements. This is crucial to ensure that subsidies lead to expanded and improved services, and do not simply replace LG funds to maintain existing standards and approaches to service delivery. The October 2012 edition of ***Prakarsa*** will look at the mechanics of OBA in Indonesia, the key lessons learned to date from various planning and implementation activities, including key challenges and successes, and the opportunities that OBA presents for other donors as well as for use in the Government of Indonesia budget process.