

50. Applying the I2S Framework to Air Pollution and Health in Indonesia

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In reading this book I was surprised to find that it reflected a wide variety of my work experiences, which were based on intuition, innovation and creativity rather than any scientifically structured arrangement. I never imagined that my environmental health research and its use in informing government policy were based on a theory. Let me provide some illustrations from my research on air pollution health impacts in Indonesia.

I have been interested in studying the health effects resulting from the use of lead additives in gasoline in Indonesia since 1992. These had been banned in other countries since the 1980s and, although senior colleagues had examined lead exposure among high-risk groups such as bus, taxi and three-wheeler drivers, as well as policemen, there were no government regulations to prevent and control airborne lead pollution in Indonesia. Their research, along with my study of lead exposure among people working in the streets of Bandung for more than eight hours per day, did not result in new government regulations until 2001.

Based on this experience, I changed my research strategy and interactions with policy makers. In 2001 I started by moving my focus from adults exclusively to also include children, as they are more vulnerable to air pollution. I studied traffic policemen, as well as commuters in private cars and on public transport, and elementary schoolchildren, comparing vehicles and schools with and without airconditioning. I expanded from lead to considering ultrafine particles, particulate matter less than 2.5 micrometres and carbon monoxide, which are routinely used in US environmental studies.

I also moved from passive dissemination of my research results (waiting for an invitation to present at a seminar or workshop) to more actively generating occasions, in collaboration with relevant non-government organisations (NGOs). This happened because I was on the Board of Directors of the Indonesian Clean Air Partnership, a national NGO. They taught me how such organisations convey messages to government. My research findings started being transmitted in various ways, involving key people locally or nationally at strategically chosen events. For example, an event was held at the US Embassy to commemorate Earth

¹ Budi Haryanto was invited as a 'senior scholar who thinks about complex environmental health problems and bridging the research-policy divide, especially in Asia'.

Day in 2004 and there I measured the blood-lead level of the US Ambassador, Ralph Boys. At the 2005 World Environment Day, I measured the blood-lead levels of the Minister of Environment, Rahmat Witoelar, as well as some senators. In 2005, in publicising my research on individual exposure measurement, I measured the air quality in the office of the Governor of Jakarta, Sutiyoso, at his request, as he was concerned about a long-term cough. When launching my investigation into blood-lead levels among elementary schoolchildren in the city of Bandung, I measured the blood-lead level of the Mayor of Bandung, Dada Suhada, and some of Bandung's senators. These events were all attractive to the mass media, who continued to contact me for interviews about the research results days, sometimes even weeks, afterwards.

These events also resulted in invitations from local authorities and the Central Government. Initially they asked me to be a resource person and speaker at their in-house and roadshow seminars and workshops. Then I became a consultant for a project based on the results of my research. I was also asked to become one of the key team developing an academic draft for local and national regulations on the prevention and control of air pollution. One outcome is Jakarta Regional Regulation No. 2/2005. And, a year and half later, on 1 July 2006, the Central Government officially announced that it would no longer allow lead additives in gasoline. Since the regulations were passed, I have also helped promulgate them in workshops and seminars. In this long struggle, I was part of an advocacy coalition of researchers and NGOs who had been working for change since 1984.

Analysis Using the I2S Framework

In summary, my experience had the following steps

1. starting from research of real problems
2. disseminating results openly through seminars, symposia, workshops and roundtable discussions
3. involving key decision makers, politicians and other people at events of international, national and/or local importance, in the dissemination of the research results or measurement of the health effects of air pollution
4. involving mass media in publicising the events and disseminating the research results
5. the initial government invitation to be a resource person and then to become a member of the team preparing the draft government regulations
6. becoming a government messenger to implement the regulations.

Let us examine these steps using the five-question framework.

1. Starting from Research of Real Problems

The purpose of the research was to demonstrate that the problems were real and to provide information to the Government for developing policy to prevent and control the problems. The response to the question ‘For what’ is: a) to develop policy to protect humans from the risk of diseases related to air pollution; b) to improve air quality; c) to provide a safer environment; d) to prevent humans from being exposed to air pollution; e) to protect humans against illness; f) to avoid absenteeism; and g) to enhance people’s productivity. Examining ‘For whom’ identified the following beneficiaries: a) the general population; b) workers (who avoid loss of income and high healthcare costs); c) commuters and drivers; d) the Central Government (improvements in the national economy); e) academics (advancement of science); and f) the Provincial Government (improved work efficiency, and so on).

If we examine ‘Which knowledge’, we see involvement of a wide range of experts from various scientific disciplines, including environmental health, epidemiology, environmental assessment, transportation, nutrition, toxicology, medicine and psychology. ‘Taking a systems view’ involves examining the policy system for both the local government of DKI Jakarta² and the Central Government Ministry of Energy and Natural Resources. Both governments operate in a top-down manner, appointing a division to develop new policy, which in turn generates a team to develop an academic draft by involving other divisions, sectors, stakeholders, academics and NGOs.

‘Scoping’ was used in selecting the research team in order to get maximum contributions from all relevant experts including specialists in children’s blood-lead levels and children’s acute respiratory infection, and personal exposure measurement for commuters, policemen and children. ‘Boundary setting’ involved considering the various limitations of time, human resources, data collection and budget. For example, it involved organising an effective communication system between data collectors and schoolteachers, who assigned children for daily monitoring of acute respiratory illness.

‘Framing’ was used to get a clear picture of the complexity of the problems, effects, causes and solutions to provide recommendations on priority actions for government. ‘Harnessing and managing differences’ was used to maximise the benefits of the multidisciplinary research team. Ensuring the same vision of the research aim was the most important key to getting agreement among the experts.

‘How’ included combining: 1) approaches from epidemiology and psychology with biomarker measurements in blood-lead research, 2) epidemiology models

² Daerah Khusus Ibukota Jakarta, translated as the Special Capital City District of Jakarta.

with environmental and personal exposure measurements for ultrafine particles, particulate matter less than 2.5 micrometres and carbon monoxide, and 3) approaches from epidemiology with a medical model of children's acute respiratory illness.

'Overall contextual factors' included the issuing of national Law No. 23/1993 on Live Environmental Control and the Minister of Health's Decree No. 1405/2002 on Environmental and Occupational Health Offices and Industries, which were judged to be ineffective in their implementation because cases of diseases related to air pollution continued to increase from year to year. This raised the demand for new regulations.

'Authorisation' (or legitimacy) was given to me as research team leader, based on the reputation of my research and my leadership skills. I gained the trust of donor agencies and other researchers. Regarding 'organisational facilitators and barriers', the University of Indonesia's culture was very supportive and there were no substantial barriers.

Finally, in terms of 'outcome', the results of the research were able to address all research questions and research hypotheses. Furthermore, the important findings could be translated into a language that is more easily digested by policy and decision makers.

2. Disseminating Results Openly through Seminars, Symposia, Workshops and Roundtable Discussions;

3. Involving Key Decision Makers, Politicians and other People at Events of International, National and/or Local Importance, in the Dissemination of the Research Results or Measurement of the Health Effects of Air Pollution; and

4. Involving Mass Media in Publicising the Events and Disseminating the Research Results

These three innovative activities were successful in Indonesia, where the general public and government officers are influenced by the mass media. The officials were spurred to make a fast response and quickly improve their performance. The collaboration of researchers with interested NGOs and the mass media can be viewed as an 'advocacy coalition'.³

³ Sabatier and Weible (2007).

5. The Initial Government Invitation to be a Resource Person and then to become a Member of the Team Preparing the Draft Government Regulations

I found various theoretical policy models useful in helping to explain the preparation of the draft government regulations

1. when the Jakarta Governor or minister appointed one of its divisions to develop an academic draft, this can be seen as a step in the 'stages' policy model⁴
2. when the appointed division invited me and others to form an expert team, this can be seen as an 'incremental' advance⁵
3. during the development of the academic draft, there was intense discussion among multidisciplinary experts, which can be explained by the 'advocacy coalition'⁶ and 'bounded rationality'⁷ policy models
4. when the academic draft was finished and the appointed division reported back to the Governor or minister, the approach taken can be explained by the 'stages' policy model, including when the Governor or minister appointed the division of law to translate the academic draft into the draft regulation
5. when the Governor or minister finally announced the Government's regulation on the prevention and control of air pollution in Jakarta and the phasing out of leaded gasoline in Indonesia, respectively, the approach used can be explained by the 'incremental' policy model.

6. Becoming a Government Messenger to Implement the Regulations

Governments need credible and knowledgeable messengers, familiar with the regulations, to inform the general public and get them to support implementation.

In conclusion, I increasingly see my role as a knowledge broker. Other government regulations that have used my research in processes similar to the ones described above are the following.

1. Governor of Jakarta Provincial Regulations about Indoor Air Quality Monitoring at Public Places, Offices, and Basement Parking Area 2010. This

4 See Figure 19.1; the stages model is also referred to as the technical-rational cycle. Althaus et al. (2007).

5 Following Lindblom (1959, 1979).

6 Sabatier and Weible (2007).

7 Smith and Larimer (2009).

regulation was based on my research on sick building syndrome among employees in offices in high buildings in Jakarta, 2008–09, as well as the studies of others.

2. Government Regulation Draft on the Strategic Plan for Health Adaptation to Climate Change and Ministerial Health Regulation Draft on the Guidelines for Training of Trainers Training Modules for Health Adaptation to Climate Change 2011. This regulation was based on my research on the health impacts of climate change and adaptation.
3. National Environmental Health Action Plan 2010, a product of the Ministry of Health and the Ministry of Environment, is based on my work on the review of Indonesia's environmental health profile in 2009.

By following the steps of the systematic I2S approach developed in this book, I am sure that more research results can be translated into public policy, which in turn will improve the welfare of the community.

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References

- Althaus, C., Bridgman, P. and Davis, G. (2007). *The Australian Policy Handbook*. Fourth Edition. Crows Nest, NSW: Allen & Unwin.
- Lindblom, C. E. (1959). 'The science of "muddling through"'. *Public Administration Review*, 19 (2): 79–88.
- Lindblom, C. E. (1979). 'Still muddling, not yet through'. *Public Administration Review*, 39 (6): 517–26.
- Sabatier, P. A. and Weible, C. M. (2007). 'The advocacy coalition framework: innovations and clarifications'. In: Sabatier, P. A. (ed.). *Theories of the Policy Process*. Boulder, CO: Westview, 189–220.
- Smith, K. B. and Larimer, C. W. (2009). *The Public Policy Theory Primer*. Boulder, CO: Westview.

Brief Biography

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