Science, Media and Policy Collaboration in Practice: Bird Flu Case in Bali, Indonesia

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Abstract : *This paper discusses how science (scientist) and policy (government) collaborate on the bird flu case in Bali Indonesia and the importance of public participation in dealing with the case. It is concluded that the collaboration between science and policy in the bird flu case in Bali Indonesia has not well practiced. There is a gap and conflict between them because they have different analytical paradigm, interest, and point of view. Public participation is very important because it can encourage them to set up quick response mechanism and increase public awareness of the danger of the virus. So they can stop the spread of the virus by themselves.*

Key words*: science, policy, collaboration, bird flu, political apathy, public participation*

"The scientist has a lot of experience with ignorance and doubt and uncertainty, and this experience is of very great importance, I think. When a scientist doesn't know the answer to a problem, he is ignorant. When he has a hunch as to what the result is, he is uncertain. And when he is pretty damn sure of what the result is going to be, he is still in some doubt. We have found it of paramount importance that in order to progress; we must recognize our ignorance and leave room for doubt." – Richard Feynman, 1955

Science today is both of a driver of technology innovation and important resource of shaping public policy (King and Thomas, 2007). Although a scientist has a lot of experience with ignorance, doubt and uncertainty, we have to confess that the role of science is very significant.

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In public health domain, scientists are struggling with complex problems. The newest issue is the outbreak of bird flu or Avian Influenza (AI) or H5N1 which is now becoming a global threat because it is one of lethal viruses that can kill human.

The first known case of human infection was recorded in Hongkong in 1997, when Avian Influenza infected both poultry and humans. At that time, the authorities managed to kill about 1.5 million of chickens to contain the bird flu outbreak. After that, several other similar cases were reported across Asia, including China, Thailand, Vietnam, and Indonesia (Tedjasaputra, 2005).

Indonesia, a country with 18,000 islands and 235 million people, is recorded as the most people who were infected by bird flu virus in the world since 2003. It firstly was happened in Java and then spread to Bali, Kalimantan, and Sumatra. Three years after that, the virus has spread to every province in Indonesia. The infection become worse since 2006 after Papua and a half of Sulawesi also has been infected and spread to 20% of total poultry population of 1.4 billion. Moreover, the country, with birds in 161 cities and regencies, exposed to the H5N1 virus. Six of the provinces have reported human deaths (Juniartha, 2006).

The level of infection causing fatalities in Indonesia has been noted as the highest compared with other countries. Until August 2007, the Health Department said a cumulative quantity of bird flu case of human has reached 129 cases and 105 cases among them bring to dead. The seriousness of the problem is evident that Indonesia now is having the highest fatality rate after Vietnam, with 70.3 percent of suspected bird flu patients dying. (*The Jakarta Post,* 03/06/2006).

The economical impact of the bird flu has reached Rp 4.1 quintillion in 2004-2007 (*Indopos,* 25 March 2008). It was caused by losses from the mass culling of poultry (which compensation of only US$1.40 per bird being paid); the demand of poultry product that has been declining; the consumption of chickens and eggs that followed to be flagging; the addition cost used by farmer and government to overcome the bird flu; and the decreasing of tourist coming to Indonesia (Hernanda, 2008).

The scientists in Indonesia have to struggle in solving the uncertainties. They have to overcome the problem by research while the disease runs quickly. Government and scientists try to figure out the mystery over the bird flu spread (Rukmantara, 2006). On the other hand, there is ignorance where most people still turn a blind eye to the seriousness of the disease. Data from National Commission for avian influenza and pandemic preparedness said that 97 percent of Indonesian are aware of bird flu, but that only 15 percent regard the disease as a direct threat to themselves and their families (*The Jakarta Post*, 06/07/2005).

This paper wants to elaborate and answer the questions: How does science (scientist), media and policy (government) collaborate on the bird flu case in Bali, Indonesia? What is the importance role of public participation in dealing with the case? I will elaborate these questions particularly based on the experiences and views of Indonesian researcher and virologist, I Gede Ngurah Mahardika.

Bali: The Gate of Indonesia

I focus on Bali, because Bali is the most important island in Indonesia. Bali is the gate for Indonesia. Bali is a small island that hosts well over a million foreign tourists a year. The deaths have become so common that they now rarely catch the world's attention — but the Bali cases are different, especially for the Indonesian government. Tourist arrivals to Bali's beaches are just now recovering from a pair of deadly terror bombings in 2002 and 2005, and the perceived risk of bird flu (though the chances of contracting the disease remain minuscule) could stymie that revival. If bombings or bird flu occur outside of Bali, that information would barely cause a ripple among travel agents and media. But when it happens in Bali, the coverage would have a crucial impact on travel agents and visitors (Widiadana, 2006).

Bali supposed to be a free zone of human cases of avian influenza. But Bali is bird flu free no longer. World Health Organization (WHO) confirmed the death of a young Balinese woman from H5N1 avian flu, the second case on the island in less than a month (Walsh, 2007). The area of only 5,000 square kilometers and inhabited by 3.2 million

humans, who live alongside approximately 12 million fowl and 900,000 pigs is a potential breeding ground for the virus. The density factor is further aggravated by two particular practices commonly employed by poultry and pig farmers in Bali.

The Indonesian government was worried enough about the Bali cases. So, it is important for the authorities to seriously and effectively deal with bird flu. They need a specific sense of urgency in dealing with this problem.

THEORETICAL FRAMEWORK

This paper uses concepts about relationship between science and practice; relationship and/or conflict among scientist, policy makers, and public, and the role of scientist.

Stirling and Gee (2002) define some key aspects of relationship between science, precaution, and practice. In their article they saw the relation between knowledge about likelihood and knowledge about outcomes and give for formal definition for risk, uncertainty, ambiguity, and ignorance.

Risk is a condition under which it is possible both to define comprehensive set of all possible outcomes and to resolve a discrete set of probabilities (or a density function) across this array of outcomes. Where there is relatively high confident in understanding of likelihood that at least some of impact will take place, there is ambiguity.

Uncertainty is a condition under which there is confidence in the completeness of the defined set of outcomes, but no valid theoretical or empirical basis to confidently assign probabilities to these outcomes. Where these difficulties of ambiguity are combined with the problems of uncertainty and compounded by the prospect of unknown beyond the scope of appraisal, there is ignorance.

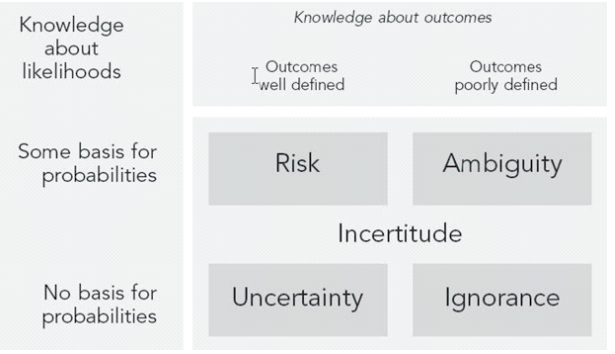

Figure 1: Formal definition of risk, ambiguity, uncertainty, and ignorance
Source: Stirling (2002)

Zahariadis (1999) also discuss about ambiguity and uncertainty. Ambiguity refers to a state of having many ways of thinking about the same circumstances or phenomena. Uncertainty refers to inability to accurately predict an event. Ambiguity may be thought of as ambivalence, where as uncertainty maybe referred to as ignorance or imprecision. Although more information may (or may not) reduce uncertainty, more information does not reduce ambiguity.

Garvin (2001) gives an idea about conflicting relationship among scientist, policy makers, and public. *First*, there is both criticism and misunderstanding among scientist, policy makers, and members of public.

Second, scientist and policy makers do agree on one point: that the public has a tendency to react emotionally or viscerally to complexity and is often incapable of appreciating the uncertain nature of environmental issues. The public, on the other hand, is also critical of both scientist and policy makers. The result is a public that lose faith in the ability of science to solve its problem and loses trust in its political leaders to act in the public interest.

Third, the implication is that the players in the three arenas use different languages, as well as have their own discourses and agreed-upon conventions for identifying knowledge and constructing persuasive arguments.

Table I. Conflicting Analytical Paradigms

	Scientists	Policy Makers	Public
Origin of evidence	Scientific studies	Availability	Popular sources
Legitimization of supporting evidence	Adherence to scientific method	Political, social, and economic implications	Received wisdom
Dismissal of conflicting evidence	Adherence to scientific method	Expediency	"Common sense"
Conceptualization of certainty and uncertainty	Probabilistic	Context specific	Polarized (either certain or uncertain)
Understanding of complex issues	Compartmental	"Need to know"	Limited by sources
Resultant knowledge	Specific and limited	Political, contextual, instrumental	Tacit, experiential, individual
What is done with the knowledge	Added to cumulative body of knowledge	Applied to current situation and context only	Added to body of personal experience
Analytical paradigm	*Scientific*	*Political*	*Social*

Table 1: Conflicting Analytical Paradigm
Source: Garvin, 2001

According to Garvin, the classification of group of scientists, policy makers, and the public may best be considered as 'ideal type'. This categorization provides a useful construct for identifying the common interest, role, socialization, ideologies and values that both define each of the groups and distinguish them from one another.

Then, what is the role of science? Weissman (1983) said although there is obvious difference between science and policy, there is a parallel in the way factual information is used, and this can be useful in understanding the role of science in public policy. The role of science in the formulation of public policy is somewhat analogous to the role of facts in either scientific or political positions.

Further, Weissman said that the purely scientific aspects of an issue are one step removed from the political process; the results of scientific inquiry, however, play much the same role as any other kind of fact. Science can play a role in ensuring that decisions are made with clear understanding of the problem and its possible consequences and likely solutions. The challenge for a scientist in the public arena is to be faithful to both ends of the decision process, scientific and political.

Many areas of government policy are claimed to be based on the best available scientific advice or risk assessment. Science is assumed to produce neutral, unvarnished findings to the best of its ability and for those findings to be prior to policy decisions (Miller, 1999). Policy making is seen as a process of selecting policy options rationally from alternatives and as firmly based on scientific endeavor.

HYPOTHESIS

From the theoretical framework I come up with the hypothesis:

1. There is a conflicting relationship and collaboration gap among scientists, policy makers, and people because they have different analytical paradigm, different interest, and different point of view about the risk of bird flu disease.
2. Public participation and independent initiative is important and needed to build a strong movement on fighting the bird flu virus.
3. The role of media is very important in enabling public participation, encourage policy makers, and communicate science and policy.

FINDING AND DISCUSSION

This paper will discuss the collaboration between science and policy in the case of bird flu in Bali Indonesia. I found three findings on the case of bird flu in Bali, Indonesia. *First*, there is collaboration gap between science and policy in the case of bird flu in Bali. *Second*, public participation is way to fight the virus. *Third*, the role of the media is necessary to enable public participation and to encourage policy maker.

1. Collaboration Gap between Science and Policy

Government policies are claimed to be based on the best available scientific advice or risk assessment. So, it is supposed to be a good collaboration between science and policy. But in the reality of the bird flu case, I found that there is a gap between them. Some factors are hampering collaboration between them. There are some problems faced by the scientists when they deal with their research: (1) lack of facilities, funding and infrastructures; (2) political pressure for the scientist and scientific result, and (3) political apathy and the atmosphere of indifference. Below, I will describe these problems:

a. *The lack of facilities, funding and infrastructures*

Indonesian researcher has to struggle with the lack of facilities. They have to rely on the WHO lab in Hong Kong for bird flu results, because there is no laboratory in the country to speed up the testing for bird flu

cases. For example, Chairul Anwar Idom, an animal health expert from Airlangga University, East Java said that there are no laboratory facilities to detect the disease existence in Indonesia; he has to make frequent visits to Japan. He is doing his research at Tokyo University and working with Prof. Yoshihiro Kawaoka. His research revealed an important finding about the spread of AI in Indonesia. After completing his research, Nidom strongly criticized the Indonesian government, describing it as lacking the appropriate urgency in tackling bird flu cases and controlling the AI virus' transmission to poultry in Indonesia (Harsaputra, 2006).

According to I Gede Ngurah Mahardika, a virologists and scientist from Udayana University, Denpasar Bali, he said that the limited funding and infrastructure hampers his work. Actually he doesn't need a high-end laboratory with state-of-the-art equipment. With the limited facilities, he can't even do genetic sequencing for the avian virus, which is imperative for him to check if there is a cross-generation process going on or not.

b. ***Political pressure for the scientist and scientific research***

Another constraint is political pressure. The scientists have no freedom to speak to present their scientific result. It happened with Nidom and Mahardika. Nidom first warned the government in 2003 that the spread of H5N1 among domestic fowl needed to be properly controlled, but the government initially responded by stating that it was a conventional poultry disease, not AI, that was killing birds. On several occasion Nidom was prevented from speaking publicly on appropriate measures to deal with this situation (Harsaputra, 2006).

In Bali it happened to Mahardika. It seems that speaking the truth on bird flu has not won the scientist investigating the lethal virus on Bali. The officials even tried to ban the information about the threat of bird flu in Bali. They were in denial and avoided publicly speaking about the possible outbreak of bird flu in Bali. They fear too much publicity could put the island's tourism industry at risk. So, it is very rare to hear someone talk frankly about the threat of bird flu on the island.

Mahardika was the lone voice brave enough to be blunt about it. Since late 2005, Mahardika and his team have conducted extensive surveys in Bali, searching for the dangerous virus. Being a virus expert, he knows

perfectly well the dangerous implications of that recent development.

After conducting extensive research, he forewarned the island-province of possible human deaths, after discovering human viruses of the H5N1 strain present in Bali. In his research he came across the daunting discovery that the virus in Bali had crossed over to mammals, such as pigs, dogs and cats. With his research outcome, he became somewhat unpopular on the island, which at the time had just begun to recover from the aftermath of the terrorist bombings of 2002 and 2005.

Mahardika said, instead of tackling the problem head on, a large number of politicians busily tried to discredit the result. They questioned both the validity and integrity of the research. Moreover, they concluded the methods employed and the samples taken were way too small to represent the island's actual condition.

Bali's government officials and politicians not only dismissed Mahardika's findings, but also criticized the validity of his research. Despite his skeptics' doubts, and claims that his lab did not comply with bio-security standards, Mahardika was confident with his findings.

Bali Governor I Made Berata even went so far as to instruct the subordinates to conduct a competing study to counter. He did so after questioning the research validity and lamenting its future impact on tourism. He did not forget to state that the island was still relatively safe from a bird flu epidemic (Juniartha, 2007).

The heat was on and the political pressure was strong for the Mahardika's team to apologize for its media recklessness and retract its findings. It is clear that the pressure for the scientific research reflected the bureaucrat's and politicians' inability to develop a proper and responsible response to the possible epidemic. It seems that they care more about tourism and money than the lives of people.

c. *Political apathy and the atmosphere of indifference*

The other problem was the political apathy because of the atmosphere of ignorance and indifference. The levels of apathy are not similar, but the end result is the same. The general public's lack of awareness of avian influenza, the lack of effective, standardized and

island-wide detection and prevention measures, and the lack of an emergency response management are some of the results of such apathy. The officials have data on the increase of outbreaks around this time. But they are not accustomed to being prepared, before trouble hits home. And the public indifference is borne out of a lack of knowledge.

According to Mahardika, the majority of the island's human population still does not view avian influenza as an immediate, growing threat. "The island is not properly prepared to tackle a possible avian influenza epidemic. The problem is the prevailing atmosphere of indifference. Many people have mistakenly assumed that avian influenza does not pose a grave threat to the island. Sadly, such indifference has also persisted among the majority of the island's media outlets, public institutions and government agencies," Mahardika said.

The lack of emergency response management and also the lack of knowledge, they did not have any kind of scenario and let alone a worst-case one. They did not know which parts of the island are the most vulnerable; the speed of the viral transmission or how many people will have been infected before we will be able to effectively contain the epidemic. At the same time, they don't have enough manpower, facilities and medical supplies to carry out an emergency operation if there is an outbreak of avian influenza.

Mahardika still has to deal with another kind of indifference; that which has been borne out of fear and greed. Many, including government officials, have accused him of tainting the island's image as a prime tourist destination. They argue that Mahardika has made a lot of fuss over an empty threat and, by doing so, had damaged the island's tourism industry. They are afraid that tourists will not visit the island if they know about the possibility of an avian influenza outbreak.

Mahardika doesn't see it that way. As a responsible host for tourists, he argued, the Balinese should make sure that their guests are well-protected from any harm. "If we can show the world that we have taken any necessary precaution to protect the island and its human population (the foreigners as well as the natives) I believe that it will boost, instead of degrade, the image of our tourism industry. Denials and cover-ups, on the other hand, are simply fruitless. History has taught us that viral epidemics

move swiftly, mercilessly and indiscriminately. If such an epidemic takes place in Bali, even the mightiest of the tourism industry's public relation agency will not be able to salvage the island's image," Mahardika said.

2. Public Participation Is Very Important in Fighting AI Virus

Collaborative approaches to decision-making, fact finding, and policy formulation are one way to address several key dilemmas scientist and decision makers face (Lenard, 2003). The other way is involving public participation as a potential solution. The empowerment and the participation of the public is the key in containing the spread of avian influenza

Mahardika said that public participation is the way to fight virus. It has been shown by the Center for Human Resource Development and Applied Technology (Create), headed by Mahardika. They are expanding its community-based project, taking its AI (H5N1) Responsive Village project into several villages in regency in Jembrana, Tabanan, and Klungkung in Bali.

They set up a model program for bird flu awareness. With his students Mahardika held an educational campaign in Sedang village, in Denpasar. For a period of three months, they conducted campaigns aimed at educating elementary school children and villagers on the bird flu virus to raise awareness on the virus. It worked. When there was a bird flu outbreak in the village, they managed to contain it to only nine households.

They introduced the use of special nets to contain the movement of chicken and ducks in the backyard farms. The net would make it easier for the health authorities to vaccinate the poultry and to implement bio-security measures. The net system was quite affordable for farmers and also easy to maintain (Juniartha, 2006).

When the people said that there is a little risk of pandemic, Mahardika said: "The possibility of a pandemic was no longer a question of if, but when. Now is the only time humans have the chance to prevent a pandemic. We didn't have a chance with AIDS because it spread quietly and unseen, but bird flu is different -- we have the chance to contain it. It is in our hands -- we can either do something about it or remain in denial."

Mahardika believed the only hope lies in community-based prevention and detection programs. In the absence of an island-wide, government-initiated prevention measure, the powerful traditional institutions, such as *desa pekraman* (traditional villages) and *banjar* (neighborhood organizations), are the only institutions that could mobilize the Balinese to act in unison.

According to Mahardika, the key to dealing with an epidemic is detection and prevention. "We must educate and empower the traditional institutions to perform those actions. Moreover, *pecalang* (traditional security guards) could be assigned with another responsibility: supervising the poultry and pig farms and keeping a close tab on poultry trade and transport. The role of *pecalang* will be particularly significant since the government's much-publicized measure of prohibiting the transportation of live poultry into the island ended in failure," he said.

The education and empowerment of the traditional institutions will play a critical role in warding off the threat. With support from those institutions there is a huge possibility that we will be able to prevent the occurrence of an outbreak or confine the outbreak to a limited geographical area. Education and empowerment are effective ways to wipe out the general public's indifference toward the threat of avian influenza.

One of the examples of independent community involvement is in Beraban Village, near Tanah Lot temple (one of the island's top attractions). The village had established a working team tasked with monitoring the existence of the virus on a daily basis. The team comprising local officials and community leaders monitors poultry at traditional markets. The team has also monitored and inspected the poultry supply entering the village from the neighboring regencies. They have guarded every door to the village.

The village administration had issued a local regulation require villager to relocate the poultry away from the houses. The rule also makes it mandatory for the farmers to keep birds inside cages. They have a team of shooters patrolling the streets to enforce the regulation. When the team encounters a roaming chicken or duck, it takes necessary measures, including shooting it. The local administration had also warned people to take serious precautions against the virus

as it could jeopardize the village's tourism industry. By involving the villagers and local administrations, it can encourage them to set up quick response mechanism. And the most important thing is to increase public awareness of the danger of the virus. So they can stop the spread of the virus by themselves.

4. The Role of Media

In the relationship, collaboration, and conflict of science and policy, the role of media is very necessary. Media is in the middle between science and policy. I know that sometimes there is a limitation of the media that sometimes the news report, most of time, only present a fragment of the big picture of what is really happening and what might be to come. Media news is, by nature, insufficient to give a clear, yet detailed account of an emerging outbreak such as bird flu (Fitri, 2007).

In the situation in which there is knowledge gap for policy development and policy interventions because of scientific uncertainty and of high public concern; media has important role in enabling participation of the citizen/ people and to help and encourage policy maker by raising emerging issues. This should entail integrated actions for more proactive approaches by the scientific community with media and society.

In the case of bird flu in Bali, the scientists have to work with the media because the government seems to be covering up this issue due to pressure from business interests for instance 'good image'. There is a pressure where the media should produce 'good news' on bird flu issues. For example, the Bali administration said it was annoyed by recent media reports of the bird flu virus on the island, which it said were creating excessive public anxiety that could damage the image of the resort island as it recovers from two deadly terrorist attacks (Hermawan and Sabarini, 2007). Media also has important role in advocating the scientists when the got pressure from the government. In this case, we saw that undaunted by these restrictions, the scientist (such as Nidon and Mahardika) got more space in the media. They even became more popular as a bird flu specialist following his pressure on the government to address the disease properly.

5. Conclusion

Based on the research question of how does science (scientist) and policy (government) collaborates on the bird flu case in Bali Indonesia and what is the importance of public participation in dealing with the case, I conclude that the collaboration between science and policy in the case of bird flu in Bali Indonesia has not well practiced. There is a gap and conflict between them because they have different analytical paradigm, interest, and point of view. Public participation is very important because it can encourage them to set up quick response mechanism and increase public awareness of the danger of the virus. So they can stop the spread of the virus by themselves.

6. Reflection and Recommendations

From the findings and conclusion I also provide reflections about this topic:

1. **Scientist in Bali Indonesia not only has to struggle with 'science' but also 'politics'.** In the condition that the collaboration or partnership between science and policy is not well practiced, the challenge for the scientists is more difficult. They dealt with negligence, ignorance, doubt and uncertainty and political pressure as well. In condition like this, they cannot do their job effectively and play their role optimally.
2. **Conflicting relationship among scientist, policy makers, and public because there is both criticism and misunderstanding among them.** The implication is that the players use different languages discourses for identifying knowledge and constructing persuasive arguments.

   Politician sees sensitive issue such as bird flu that can influence the image of the country. So it must be treated and published in a very careful way. According to the politician, the tourism is a very fragile and vulnerable industry and can be influenced by the result of the research and by the media publication.

   Politician also assumed that the scientist has to take a number of steps before the result of scientific research (the content of which might

disturb the public) were released to the media. The steps include the internal review by the university's administrators and experts, and external review and coordination with all relevant government agencies.

On the other hand, scientist sees the result of this kind of research should be made available to the public as soon as possible. In this case, the scientist has to find a way to do exactly that the scientists need to release the information in such a way without raising an unnecessary furor and cause the misunderstanding.

Based on the reflections, I provide recommendations below:

1. In collaboration between science and policy, it is important that the politicians should not assert their power over the science, scientist, and academic institution. They should show respect on the academic freedom and freedom to speak.
2. Media should take care about their publications which can have influence positively or negatively. Media has roles to give information, to educate people and to give awareness to the people about the bird flu disease. Media also has significant role to do social control. They should be critical to the government and politician. If there is a conflict between science and policy, the media should take sides on public interest, because when the two powerful parties have conflict, the people will get the impact.
3. In condition of complex and problematic issue like bird flu, a good collaboration among the government, scientist, and media is needed. They have tasks to educate and motivate people in enabling public participation. So, the synergy, mutual movement, and consistency become the key efforts in beating bird flu threat.

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