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Innovative Strategy to Disseminate Science Information to Policymakers

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FOREWORD by EDITOR-in-CHIEF

We are very pleased to inform the readers that Journal of *Science, Technology, & Innovation Policy and Management* (STIPM Journal) Vol. 4, No. 1, July 2019 edition is now ready for public reading and views. STIPM Journal is an online research journal managed by the Research Center for Science, Technology, and Innovation Policy and Management, Indonesian Institute of Sciences (RC-STIPM-LIPI).

The journal provides scientific information that needed mostly by the research scholars as well as STI policy makers. As a peer reviewed journal, STIPM provides free access to research thoughts, innovation, and original discoveries. In this issue, we bring together research findings on development and adoptation of science, technology, and innovation policy and management from Malaysia and Indonesia.

First article is composed by **Wati HERMAWATI** entitled *Technology Transfer from Public Research Institute to Community: A Case Study*. This research article examines the technology transfer mechanisms into practical applications of the community. The success of technology transfer to community itself were demonstrated by the increased ability of recipients namely SMEs and farmers to replicate the technologies, increased their production, enlarge their market as well as increased new knowledge, skills, and productivity.

Second research article entitled *A Scientometric Study on Biodiesel Development in Indonesia*. This article is presented by **Mesnan SILALAHI et al.** The article describes the results of scientometric studies in the energy sector, especially in the field of biodiesel in Indonesia by using a mixed method through content analysis and in-depth interview. Quantitative research uses bibliometric basics and content analysis, where text mining is triangulated with the results from in-depth interview with several prominent Indonesian researchers in this field. Content analysis is conducted by topic modeling method by analysing the papers' abstract. This article reports on the results of a scientometric study, based on publications indexed in Scopus in the energy sector, especially in the field of biodiesel in Indonesia.

Nor Ashikin Mohamed YUSOF et al. present an article entitled *Theoretical and Practical Gaps in Policy Making Process in Five Organizations*. This article reports case studies involving five national policy documents and internal policies at several key governmental department and organizations. The findings from the study enables the researchers to make a comparison between the theory of policy making and the practice of policy making in Malaysia. The findings show that there is still a huge gap between theory and practice in policy making and policy studies in Malaysia.

The fourth article with the title *Innovative Strategy to Disseminate Science Information to Policy makers* is presented by **Azmi HASSAN.** There exists a huge gap between science and technology discovery and the formulation of public policy mostly due to the poor understanding on how to disseminate the

news not only to policy makers but also to the general public. To bring accurate, relevant information from the front lines of research to the policy makers, this paper describes how innovative strategies that use the media as the conduit are formulated in more systematic ways.

Dian KUSUMANINGRUM et al. present an article entitled *Structural Equation Model: Intention to Use Mobile Banking of Bottom of Pyramid Customer*. The purposes of the study are to identify the predicting factors influencing the intention to use mobile banking and empirically validate a model explaining the behavioral intention to use it, especially on the bottom of pyramid (BOP) segment. The model used was structural equation model (SEM) based on partial least square (PLS). The data used for developing the model was based on a survey to 100 BOP households. The results show that the variables that have the highest significant effect on BOP's customer intention to use mobile banking are involuntary barriers, followed by perceived risk, and attitude. This result can be further used by researchers and mobile banking providers to evaluate the existing mobile banking services to improve its contribution in providing better market penetration and more appropriate financial services for BOP and ultimately financial inclusion in Indonesia.

Lastly, **Karlina SARI et al.** present an article entitled Indonesia in *Functional Food Industry: Market or Player?* This paper presents the overview of functional food industry in Indonesia. It analyzes the prospect of Indonesian functional food industry from demand, supply, and regulation perspective. The result of this study is Indonesia should have a good prospect as both the market and the player in functional food industry. Currently, baby food and toddler are Indonesia's biggest market of functional food for baby formula milk and baby food. Another functional food market segment prospective to be penetrated is elderly who have bigger risk of disease, such as hypertension and arthritis

The journal is indexed by Google Scholar, ISJD, IPI, DOAJ, BASE, and OCLC World Cat, which makes wider journal dissemination. We would like to express our immense gratitude to our international editorial board members, reviewers, and authors for their contribution to this issue. We hope this publication will prove useful for readers and contribute to the enhancement of science, technology, and innovation. We expect that STIPM will always provide a higher scientific platform for authors and readers with a comprehensive overview of the most recent STI Policy and Management research and development at the national, regional, dan international level.

Jakarta, July 2019

Editor-In-Chief

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Volume 4, Number 1, July 2019

LIST OF CONTENTS

LIPI
STI POLICY AND MANAGEMENT
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STIPM STI Policy and Management

Innovative Strategy to Disseminate Science Information to Policy Makers

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ABSTRACT

There exist a huge gap between science and technology discovery and the formulation of public policy, mostly due to the poor understanding on how to disseminate the news, not only to policy makers, but also to the general public. There has been an outright explosion of new knowledge and no one person can know it all. To bring accurate and relevant information from the front lines of research to the policy makers, this paper will describe innovative strategies using media as the conduit. But, with this approach, the critical pre-requisite is that the researcher and media must work with each other and as the author found, this does not always come easily. This impasse results in public policy formulated without taking any account of new discoveries, especially in science and technology field. It is hoped that by applying the ideas put forward, scientific, and technology discoveries will be applied when formulating public policies in more systematic ways.

A. INTRODUCTION

Introducing new discoveries in science and technology from the research world into the public sphere can carry heavy costs, if not done in a correct manner. Many academics are quite reluctant since it requires huge expenditure of time and effort that could be invested in the laboratory. In a competitive field, every moment counts for manuscripts and grants. There are social risks as well; many scientists admit a concern about criticism from colleagues for forays into the public sphere.

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The media is considered as one of the medium to disseminate new research discoveries (Flecha, Soler-Gallart, & Sorde-Marti, 2015). For example, there is no doubt that academician will feel excited seeing and reading their discovery in the paper, but there are negative connotations and ethics involved that need to be met.

Researchers hold the belief that to present the research facts and figures to general public is often regarded as an unadvisable activity. It is considered highly inappropriate to attempt to inform the public of recent advances in research and discovery development using mass

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media. Newly research findings are regarded as a speciality for an expert in which field he/she excels it. Therefore, trying to communicate at a low intellectual level will certainly undervalue the effort of these researchers. That is the current general belief.

There was a time when researchers can lock themselves up in the laboratory and be oblivious to the outside world. With pressure of the academia world to deliver results and working under the 'publish in reputable journal or perish' environment, one tends to understand the dilemma faced by these academics. Is it fair to ask them to take on another task of communicating science to the public, for example, via the media? Academics who decided to go 'public' with their research are risking themselves being ridiculed by their peers. Cheap jibes and cynical jokes will be plenty.

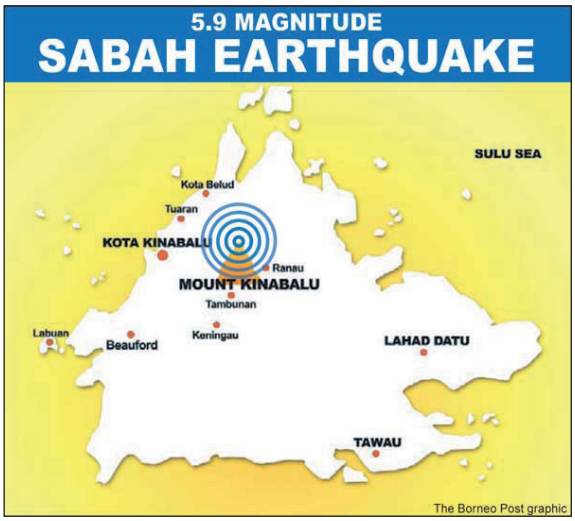
Sometimes, it is not the academics' fault when the new research findings are wrongly reported or skewed as the news appeared in the media. This being for a simple reason that research findings may be picked up by press in a variety of ways. One of the obvious means is that reporters from news agencies often attend conferences in order to learn about new research findings. However, the most common ways is that reporters rely on the internet search to identify researchers who would comment or provide an expert perspective on a story they are developing and enquiries, but sometimes it may comes completely out of the blue.

When a 5.9 Richter scale earthquake struck Sabah, Malaysia, on June 5th 2015, it is considered as a rare earthquake occurrence since Malaysia is not part of the Pacific Ring of Fire, where the active faults and volcanoes are located. The local media runs this story in a much-sensationalized way up to a point of fear mongering. Malaysian earthquake experts had the dilemma of facing the media and are accused of encouraging the media to report a story in a way that varnished the real knowledge about earthquakes. To make the situation worse, days before the earthquake, the local media reported that a group of climbers had gone naked at the peak of Mount Kinabalu, the highest mountain in Southeast Asia and local people considered it as a sacred one. The locals believed that the action of the disrespectful tourists incurred the anger of Sabahans because the foreigners had not respected the local traditions.

The same goes when Malaysian Airlines MH370 suddenly vanished from its flight path over South China Sea in 2014. Malaysian aviation experts were tormented for their hesitancy of not assisting the media in explaining the situation to public. The constraint is that these experts felt insecure of going public because the lack of available facts and data on the MH370 issue. Even after four years, this issue is still a mystery and the situations really have not changed much with experts still reluctant to talk to the media.

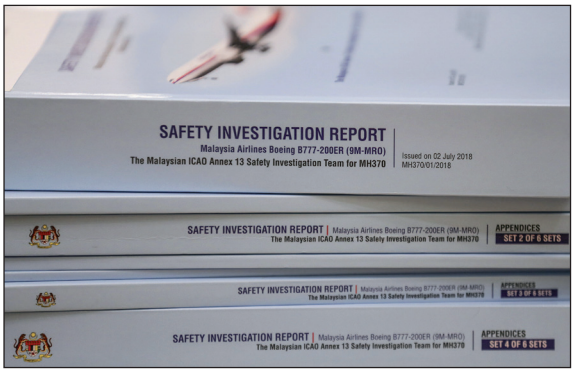
Even prominent academics, who are active in the media, will not escape this kind of scrutiny. It is a common situation that most of their colleagues greet this with utmost contempt because there is a perception that a highly complicated research has been oversimplified, or worse cheapened, before it was released publicly. It feels like if academics turn out to be plased going public, their colleagues and peers would regard them as shallow academics. This is the dilemma faced by Malaysian academia. The Sabah earthquake and MH370 disappearance highlights the difficulty faced by the academia (Figure 1 and 2).

Carl Sagan, for example, is an astronomer who is widely known for presenting science to



Source: Malaysia Meteorological Department (2016)

Figure 1. The 2015 earthquake that struck Ranau, Sabah, Malaysia gave academics a dilemma on whether to talk to the media or not.



Source: Malaysia Transport Ministry (2018)

Figure 2. The release of the MH370 final report does not alleviate the reluctance of experts working with the media on this issue.

Source: Author

Figure 3. Misinformation about the Nipah ; virus that struck Malaysia few years ago made policy makers strayed far from true information .

the public. The motion picture Contact, starring Jodie Foster, is based on his book by the same title. His writings and media appearances have huge public attraction, yet that success led some senior members of the United States science community to regard Sagan with great suspicion. It is widely believed that this perception led to the denial to Sagan of membership in the United States National Academy of Sciences for the first application in 1992.

Some academics tend to believe that presenting their research work through the media is a form of advertising or marketing and it is considered to be undignified and taboo. There is also a feeling that promoting research through the media is self-serving and that is why most academics shy away from the media.

B. GAP MINIMALIZATION

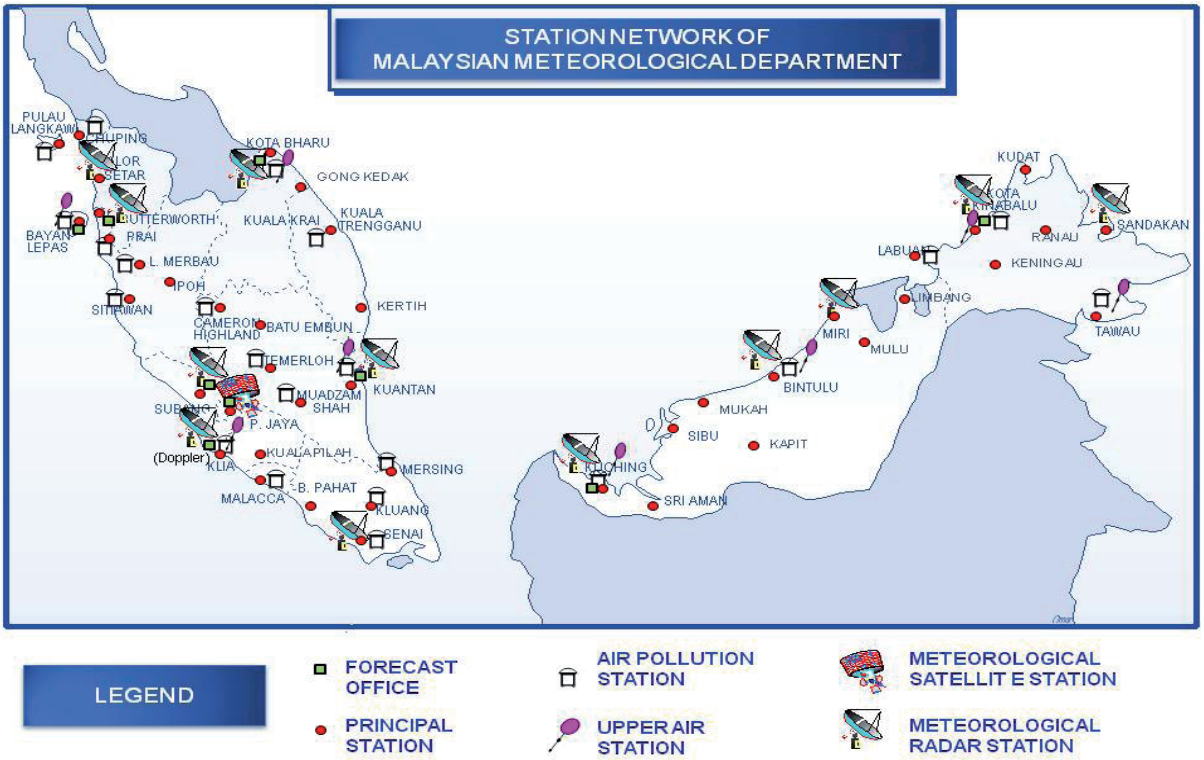
The gap between academia and media is very deep. The coverage on academia activities given by the printed media is at the very best minimum (Cabré-Olivé, Flecha-García, Ionescu, Pulido, & Sordé-Martí, 2017). Only a handful of journalists are assigned to academia research and development jobs, which is only given in a piecemeal manner. Most journalists who occupy beats are called reporters, as in sports reporter, crime reporter, or business reporter, at least until they became columnist. Therefore, it is clear that when someone is assigned to the science beat, for example, will be called the science reporter or sometimes science writer.

There is science news everywhere and people are eager to give it out. The difficult part is that to figure out what are they talking about and to write it in vernacular form. The gap of knowledge is large. Academics tend to evolved in their own world of statistics, analysis, theory, experiments, probability, and so on, which is considered as a foreign world to non-academics.

For example, Japanese encephalitis (JE) (caused by Nipah virus) crisis that struck Malaysia several years back (Figure 3). When JE strucked, suddenly, everyone was talking about viruses and it became a very important issue. Scientifically, because they contained all the essential information about genetic programming. But what caught the interest of the print media editors is sometime considered different from essential information. Everyone wanted to know what causes the epidemic, particularly the virus carrier. What happened was that the reporters went to all the right academics, but asked all the wrong questions.

The whole scenario repeated when the haze and rising temperature due to the El Nino phenomena affected the country. The way the government handled these issues are commendable, but apparently the public's restlessness over this issue seems like they did not learnt the full information. They were under the impression that an uncertain field of science was being employed as the basis for assurances over safety, while their concerns were dismissed (Figure 4).

Malaysian academics are always complaining that they were misquoted and misunderstood



Source: Malaysia Meteorological Department (2016)

Figure 4. The hot spell brought by El Nino phenomena put strained on scientists to explain in layman terms.

by the media and there is some ring of truth in it. However, science writers and reporters are caught in the middle in the distortion process. Their job is to interpret whatever facts given by the academics and they worked within a system to communicate more clearly and truthfully to their readers. There was also forthcoming sinister as well. As readers become more sophisticated, editors started wanting a certain spin on science stories. Depending on how you look at it, it can be positive or negative spin.

C. FACING THE CONSTRAINTS

Science and technology development will affect the lives of people in every aspect. People all over the world have high hopes that these new discoveries will lead to healthier lives, greater social freedom, increased knowledge, and more productive livelihoods. However, there is also a great fear of the unknown brought by these new discoveries (Cabré-Olivé, Flecha-García, Ionescu, Pulido, & Sordé-Martí, 2017), for examples, the industrial disaster of Bhopal, the Chernobyl and Fukushima nuclear tragedies, the birth defects caused by thalidomide, and the depletion of the ozone layer caused by chlorofluorocarbons that causes global warming. Hence, people tend to develop general mistrust towards anything that comes out from the academia environment.

While many academics do ground breaking research and have brilliant ideas, their communication with the general public does not demonstrate the real situation (Franklin, 1997). It is difficult to emulate the likes of physicist Brian Greene, who is capable of explaining the hideously complex theory of multiple universes using entertaining analogies, never resorting to the impenetrable jargon of his discipline. Also, it is not as easy as the Canadian Prime Minister, Justin Trudeau, explained, in an enlighten way, about quantum physics to be appreciated by the public.

Reporting a newly academic discovery needs to be released on the right time. Trust must be built with the readers, so that the uncertainties of scientific results can be explained in a language understood by all. It is essential that the communications do not occur in a vacuum and leave the public confused.

There is also the lack of confidence by both the academia and journalists on the understanding of how research is conducted and how to interpret the results of research. For example, when journalists do not understand how a scientist works, they will have a hard time writing stories about new science discoveries in an understandable manner. Journalists tend to be confused to deal with statistics and it had distorted their stories.

D. MEET THE MEDIA AT RISK

It is widely know that academicians are always cautious when facing the media. One thing considered as normal apprehension is will the research findings be misrepresented by the reporter. Therefore, it is very important to clear the implications of these misrepresentations or whether it was done on purpose. The academicians need to considers every step to prevent those implications and it is one of adopted cautious approach academicians would take when they are face-to-face with the media. They must be extra careful if the research is focused on ethically sensitive or controversial issues and may decide that the potential benefits of media dissemination do not outweigh the likely risks.

Some of the researches conducted do have a public disclosure requirement. The organization where the academicians work or the funder may require checking and approving any press releases about reporting research findings. This requirement reflects the potential effect of the institutions reputation resulted from the wider dissemination.

E. THE STRATEGIES

Academicians and journalists tend to see each other with suspicion. Strengthening the relationship between these two groups are the key strategic issues. Mutual trust and respect between these two groups need to be built. Here are some points to ponder to bridge the so called divide.

1. Understanding Work's Nature

Journalist and science writers must appreciate and understand the peer-review process that academicians are so adamant about. It means everything for the academics if their research paper is reviewed by their peers and considered as part of the process to publish research findings. Hence, research findings reports that are not subjected to an independent review are not being considered in the academic world (Wooley, 1992, 2001). They must understand the world of journalists too. They work under ferocious deadlines and are always in a hurry. From 3 p.m. to 5 p.m., they are usually worked their articles to be submitted to their respective editors. The academics need to appreciate that answers are needed between these two precious hours.

The science writers must understand what they are writing about and problems will creep in if academics insist that a scientific jargon must be included in the article. This is a tough job to do, but in order to translate the story accurately into an interesting and intelligible form to the layman, this requirement is a must. Jargon must be translated and simplified; the readers do not need information with too many technical details.

Science writers are specialized writers, one of a kind. Unlike other 'types' of writers, science writers have unique responsibilities (Leo & Subramaniam, 2014). Sports writers, for example, have readers that already knew the rule of the games that are being reported, while science writers must introduce the rules of the 'game' in every science article.

2. Avoiding Personal Violations

Science writers need to understand that they cannot sensationalize any scientific results, no matter how tempting it is. They need to appreciate that science usually advances by a series of incremental steps, sometimes with trial and error procedures along the way.

Science writers have to be aware that academics dislike the 'personal equation'. Someone will question the popularization, not research, but the people who conducted the research. The writer has to be extra cautious when writing about the researcher's hobbies, family, or extracurricular activities since the information will be translated by other academics as personalizing the research.

3. Providing Relevant Training

Higher education institutions should provide programs to train academics on how to communicate their research to the public. Science students are required to take courses in how to disseminate scientific information in an understandable fashion. This is because there is only a handful of academics who know how the media works and the consequence is they lack the skills to write effectively for the general public: knowledge management.

New science journalists need to be trained too, so they can communicate with scientists (Fresco, 2015). Higher education insitutions should provide interdisciplinary curriculum of science, engineering, mathematics, communication, English, and liberal arts.

4. Establishing Two-way Communication

Like political journalists, science journalists/ writers should be confident and comfortable in approaching their sources. This scenario is apparent for writers who are not trained to write science matters. They have to treat their science sources with some skepticism and intelligent analysis as done in other field reports (Craig, 1999). Otherwise, these academics will treat the writers with 'science is hard and you're no smart enough' syndrome.

Communication strategy requires commitment, both from the academic and journalist, on matters from planning, discussion, decision making, and implementation. New academic issues will rejuvenate public interest and it is important that communication opportunities are kept open for both parties.

5. Accessibility to criticize

Higher education instituitons have to make themselves more accessible to the media. Most of these organizations usually routed media inquiries to the public relation office, a policy that most media finds it cumbersome. A free flow of information will certainly lead to a more positive coverage of an organization.

Also, editors must be more generous in providing space for local science issues. Wire services, such as AP, Reuters, and UPI, or syndicates, have superb coverage of scientific issues worldwide. However, they lack of local angle and may alienate potential readers. Therefore, it is very critical for the local newspapers to provide more space for the academics to publicize their research which are usually related to the local issues.

6. Always be prepared

It is common that academics plan carefully what they want to say about their research, think about how it could be interpreted, but also think about the question of the need to disseminate through the media related to the aims and impact of the research (Reale et al., 2017). They can politely decline to answer questions that is considered as inappropriate. As an example observed, note how politicians answer questions on TV and radio, while they may not always be a model of ethical practice, their strategies for deflecting questions may give academicians some useful tips.

F. CONCLUSION

There is no denying that the immense impacts of science and technology have brought to the public. What we are facing today is a daunting challenge of not only to understand the current multiple and inter revolutions of science and technology, but also to comprehend how it will affect the future of humanity.

Academics have ethical and social obligations to the public to play a role to disseminate this scientific and technological information. The least they can do is to make themselves available to the public's representatives, in this case the media. Most of the researches are supported by grants the taxpayers paid. Humanizing science and technology helps involve the general public in science and advanced technology matters (Peters, 2013). Human interest stories will make science more accessible to the younger generations that might be interested in scientific careers.

We need to redefine the role definition of an academic, away from someone who communicates only to peers and into someone who shares their interest. For example, due to their

career advancement needs, academics are only interested in publishing in reputable journals. For those who are disconnected and uncertain, the media can play a constructive role in informing and connecting, both to academics and readers. Science journalism has become an essential point of outreach and translation. Stories are told that no one else is interested in doing so. A good editor will ensure that his publication covered science well and time sensitive with established science beats and funding and time are allocated so that science stories are published. We need an informed public when it comes to science because this field has the force to change people's lives.

A knowledgeable and well-informed public in science and technology matters can influence local, national, and international political decision-making (Irwin, 2001). Academics are often frustrated and become disillusioned when their expert advice fails to influence in a policy making decision. The important role of the science communicator can have in generating public pressures to address issues and to ensure that policy makers are fed with the correct scientific information is undeniable.

It is good to have a tool to measure and to improve communications between academics and policy makers. To this end, a guide called Communications Monitoring, Evaluation, and Learning Toolkit developed by the Overseas Development Institute (ODI) (2018) is a good point of reference. It is an easy tool to use with example sets of questions provided as general guidance. Even though it was developed as an internal usage for ODI staff, it can also be applied to other related works outside the organization.

It is also true that sometimes policy makers felt that scientific community and academics is their enemy, not as collaborator. Hence, these policy makers shy away on taking pointers from their perceived enemy. Establishing a two-way communication, that is, these two groups need to meet more often as to understand and appreciate what each are tasked to achieve. Most important of all is the respect need to be accorded by all involved in the evidence-based policy making process.

The implication when policy makers and the academia do not communicate with each other is severe. Policies developed which are meant to benefit the society are sometime rejected outright by the targeted group itself due to lack of understanding on the policy itself. The controversy surrounding Malaysia's Ministry Science, Technology, Environment, and Climate Change (MESTECC) regarding rare earth mining activities in Kuantan, Pahang, is an example when policy makers seemed to be disconnected with the scientific community.

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