



EXPERIENCE IN MARINE DEBRIS DISSEMINATION IN INDONESIA

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ABSTRACT

Scientists collect data, analyze the results, and build conclusion to their research. To gain more valuable impact, scientists also transfer their knowledge to society. Science communication is particularly important to enhance the research and also better understanding of the society to help the nature. This research was conducted in four different locations: Jakarta, Pangandaran (West Java), Bali, and East Nusa Tenggara. Participants chosen included government and private stakeholders as well as industry, communities and tourists, students and educators, and the conservation community. This research was conducted in a span of 4 years (2015-2018). The results obtained that to provide information related to MD to various audiences have different ways. For agencies and stakeholders in government, sharing information needed is how to find long-term solutions. For educators and students basic understanding is needed regarding MD. For the community and the community is synergy with the local government. Moreover, in this study it was also found that with different ways of conveying, the transfer of knowledge would be easier. This is evident from the ease of the audience to absorb the knowledge if done with the right method. The challenge in the future is to use online media to get more viewers. With a new social media and simple method, scientist can easily use online forms, free templates from internet to build flyer, banner, information about marine debris.

Keywords: Ocean science, coastal community, PKM, communication, media, stakeholders

INTRODUCTION

Dissemination is important output of the research, especially for lecturers in Indonesia. As a lecturer, there are four main activities: teaching students in the class or laboratory, research, dissemination (PKM: Pengabdian Kepada Masyarakat), and others minor activities. It is very important to communicate science to society in order to gain more effect on the research impact. To communicate the research output, [1] the researchers use science communication technique to increase society awareness. The Indonesia government and the university expect that with this activity, the gap of science and technology become rigid. Scientists use scientific data to get valuable results and partake to the citizen. Science communication is particularly important for general public especially if the information is very important for policymaking. This information have to transfer to the society include stakeholder, government, specific audience, policy makers or other participants. The strategy for communication, [2] mentioned that we have to know the audience, identify the main message, choose the communication tactics, and measuring success as communication continues.

In general, the usual way is to create small seminar, training, dialogue, and field trip in one of specific area or district. For marine science lecturers, the locations almost near the coastal area. There are many activities to transfer the knowledge to the people, [3] conducted mini seminar at senior high school in Pangandaraan to describe about marine debris. Other scientists also done focus group discussion (FGD) to shared their knowledge to stakeholders.

Nowadays, the technologies especially internet, have a wide impact to transfer the information. Many universities use online media, streaming online, offline media, conferences, and campaigns to communicate research to people. The social media such as Facebook, Instagram, other built internet social media platform also used to gain more audience especially with global topics such as climate change, marine pollution, and other global issues.

In Indonesia, the communication is very complex because the diversity of culture, religion, level of education, and different issues. Especially in marine topics, there are many topics related to Indonesia nowadays. In marine topic, Marine Debris (MD) [4] and illegal fishing [5] as a "hot" topics nowadays. This paper discussed about the recent research of lectures to transfer the research to the society, academia, institution, and community especially in marine debris topics. Based in several publications, Indonesia become number two as source of pollutant in the world. Moreover, this paper will enhance how to communicate the effect of MD for society.

METHOD

The MD experienced in this context is to compare the dissemination process and experience to institution, stakeholders, educators, community, and society. This research paper was carried out in the context of the MD experienced in communication in several areas: in Bali to tourism in 2015, in the Jakarta to stakeholders in 2016, in the Pangandaraan area to senior high school and educators in 2017, East Nusa Tenggara to coastal community especially for tourism stakeholder in 2018.

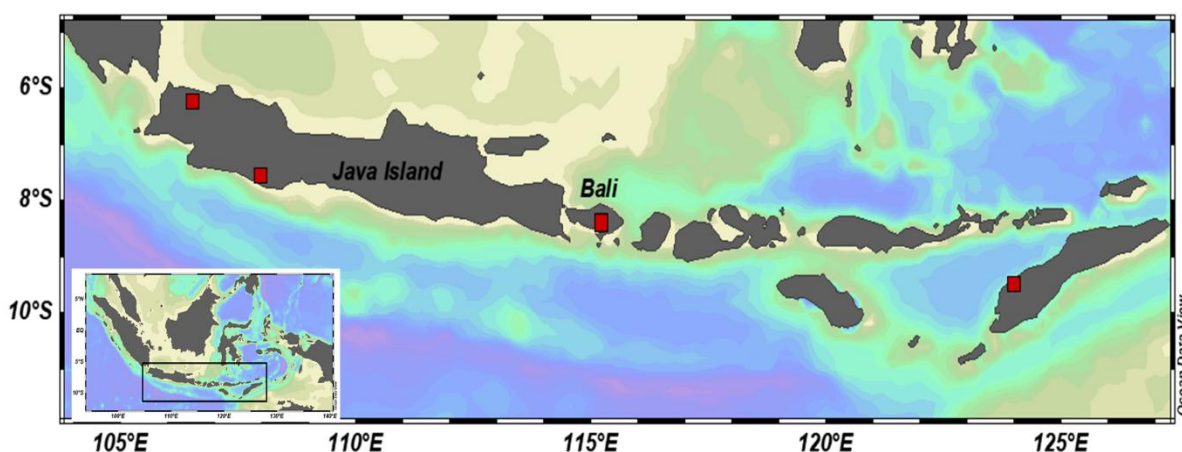


Figure 1. Map locations of Marine Debris experiences. Two locations in Java and one location in Bali and East Nusa Tenggara

The activity carried in Bali was a research to quantify the debris on the Kuta beach. Bali is one of the busy tourism in the world. In Jakarta, the meeting held for drafted the National Action Plan book. For Pangandaraan, it was one of the activities in the context of collecting data on the beach area and also transfer of knowledge to senior high school student and teachers. In Nusa Tenggara, it was a joint research with Conservation institution and also with community who conserve sea turtles. The data consists of the experience of stakeholder, educators, and society in marine debris actions. The number of participants for each activity is different. Participants in Jakarta for each meeting are around 15-20 people, in Pangandaraan is 40-50 people, in

Bali are 10 people, and in East Nusa Tenggara are 5-10 people. To enhance this paper, the literature review by looking at the other scientists activities in Indonesia and from literature context. The data performed through review of the existing literature, mainly peer-reviewed papers especially from dissemination journal in Indonesia, articles and books, and also from self-experiences.

In Indonesia, MD is one of the national issue is currently underway in all sectors. Moreover, Department of Marine Science, Padjadjaran University is one of the leading university that have MD data in Indonesia. Since 2011, almost 60 locations had collected from west to east side area especially in Java Island. Lecturers and students did the activities with local community and stakeholders.

RESULTS

Stakeholder dissemination

In 2016, a team panel were formed to built National Action Plan (NAP), provide step by step guidelines to reduce the plastic pollution in the ocean. These groups shared scientific knowledge with nonscientists and also with stakeholders through public presentations and in public forums. In the presentation made before the stakeholders, there are several things that need to be explained, including: understanding related to the origin of plastics in the ocean, how plastic can enter the food web and also its economic impact. Then also explained how each stakeholder resolved the problem. One example is the role of industry to produce packaging that can be recycled. For academics, the important role is to get as much data as can be drawn. Then the exposure from government institutions stated that government regulations will be made to reduce the impact of plastic waste both on land and in the ocean. In 2018, the PERPRESS (Peraturan Presiden) launched on the other hand need carrying out to society. The society should respond this guidance to avoid misinterpretation and then create their own programs.

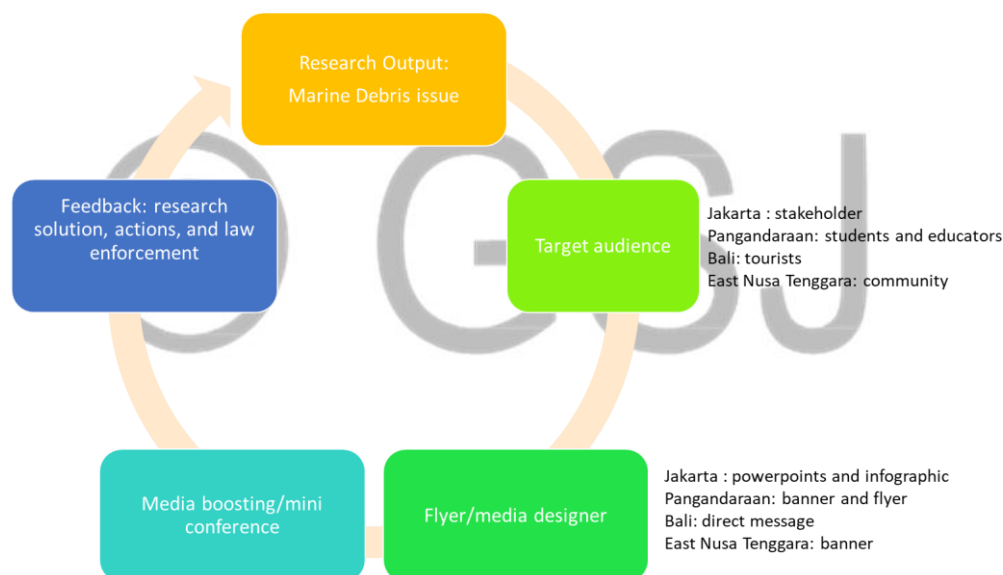


Figure 2. The main process to communicate MD based on experiences

From the results of the presentation conducted there are a number of things that need to be observed, including: almost all participants present (90%) stated that plastic waste and other non-organic waste are interesting issues and must also be resolved with a top-bottom regulation scheme. In this case the role of the central government is very important so that local governments and communities can immediately apply the regulations. In this case the participants present were already at the stage of understanding the importance of solving waste problems, so finding solutions was very easy. Moreover, for government agencies must be able to adjust to other programs in the ministry due to a limited budget.

Students and Educators transfer of knowledge

Our own experience noticed several points when conducted marine debris information to senior high school in Pangandaraan, West Java. First, in senior high school, they did not know much about marine debris. Therefore, to communicate the effect of marine debris, we should introduce more detail about "what is marine debris". Based on previous study, [6] that showed that the important thing to increase awareness about MD is to know about understanding stakeholder perceptions. Different audience will approach the issue with different levels of experience and understanding, different motivations, and different perspectives based on local cases. To make it easier for students and educators to understand about IMD, there is also a brief training on how to collect waste around the school. In the end, they learned how to identify waste by scientific methods. From this experience, it was found that students needed a combination of class and field exposure.

Tourist perceptions

Second, the issue of MD is different within the region, for instance in Bali, the MD came from the north side [7] while in Pangandaraan the MD came from the tourist activities near the coastal areas [3]. The phenomenon of the west monsoon that blows in November-March, causing debris that float freely in the water dragged and accumulated on the shore of west Bali (e.g. Kuta Beach), with a total per season about 5.400-8.400 m³. The result showed that the tourists aware about the Kuta beach's contamination caused by the debris. Some of the tourists thought that debris found in Kuta Beach was from the ocean, and some of them think that there are garbage on the beach is the result of the activity of tourist and tourism industry around the beach. The respondents also believed that cleaning the debris everyday could be short term solution. The respondents are also believe that the role of the government and the tourism sector around the coast of Kuta have the responsibility for the cleanliness of the coast. The tourists also hope the government could find the best solution for this debris. This direct interactions between the researcher and tourists had pointed out that the transfer of knowledge between the output of research have the same vision.

Community approach

MD socialization in Kupang, East Nusa Tenggara was carried out at agencies and also to the people who conserve sea turtles. In essence, the dissemination of marine trash is more basic knowledge related to marine waste and also the impact it causes. This was then responded by the community by finding alternative solutions that were easy to do and could be done for a small fee.

Communities in this region do not yet know about the relationship between marine trash and sea turtles. The community must be involved more to know how marine trash can affect the lives of marine life, especially sea turtles.



Figure 3. Sharing MD to (top) stakeholder (KKP Staffs) in East Nusa Tenggara and (bottom) discussion and give information to NGO in Rote island

Moreover, the settlement of marine trash around the coast including the water column should be discussed more with the local community. This is related to the habits of the people who litter. The important point of this direct message is that with intense communication between the community and researchers. Basically, people can understand easily about marine waste but it is difficult to see long-term solutions. they hope that the government can communicate with them to overcome this problem from a lower level such as village communities and coastal communities.

Challenge and future activity

Moreover, PKM or dissemination in Indonesia mostly based on mini conference, field campaigns. These activities have a direct impact, while the message gain in a fewer people. Moreover, the FGD give different approach to reduce impact of MD with national and local context. Moreover, different institution have a different link and program based on short term and long-term approach. For instance, in the case of MD, the institution linked it to other programs such as conservation to turtle and fishing activities. While to the local people, they talked about economic benefits.

The main idea how to receive more impact about MD, the scientists have to list the outline such as: explain about the source of MD, communicate how marine litter has direct impact for people, ecosystem, and economic loss, consider personal experience of the problem to enhance the solutions. In global context, many NGO, scientist, and NGO use social media to inform the MD to society. [8] used Massive Open Online Education (MOOC) to inform about this problem to global students. In the other hand, some institutions also use facebook, instagram, personal and institution website, and twitter. Social media is one of the most popular new forms of media in internet based, where users can easily share and create contents in real time and anywhere with easy method. Indonesia people is one of the biggest user of social in the world. They use social media every day to inform about social life and share to another group. Moreover, this is a good way to transfer research from scientists with a easy method and simple way. The consequence is that messages that are delivered quickly, even viral within a very wide range while the recipient of the message acts as the determinant of the timing of the interaction [9].

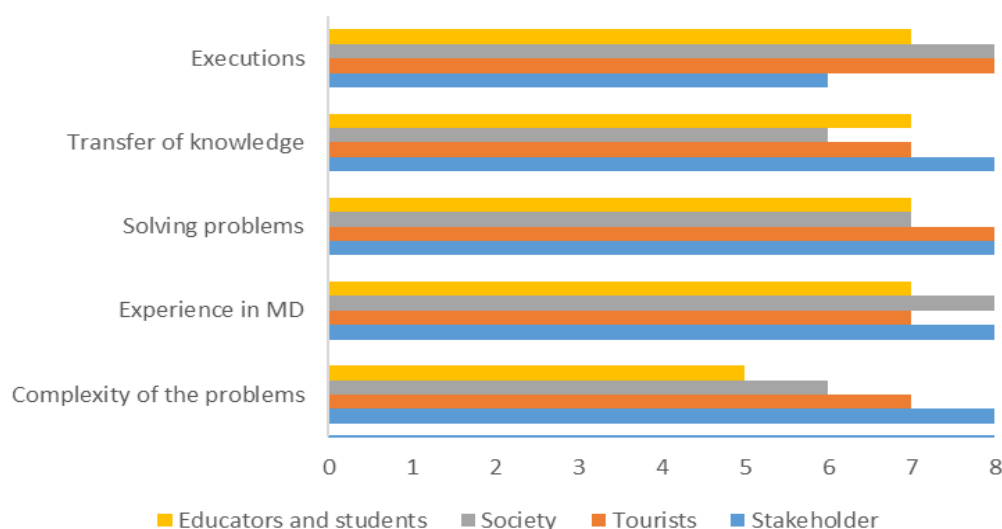


Figure 4. Level of knowledge of different audience in different places. The scale shows number 0 (hard) and 8 (easy)

Based on Figure 4, it can be seen that the understanding related to marine waste is different for each participant. For audiences from government agencies, the private sector, NGOs, and academia, understanding of marine waste is at an advanced stage but difficult in terms of execution due to limited funds and many other programs that are also priorities. For tourists, the solutions offered are more short-term solutions but have a significant impact. Moreover, for the conservation community and environmental activists, synergy is needed between the local government and the community in dealing with marine waste.

On the other hand, understanding related to marine waste must look more at the target audience. In this case, the community must be made simpler by describing the problems around them. For academia and institutions it is directed to look for medium-term and long-term solutions and adapt to other programs that are already running.

Based on [10] There are various approaches to communicate output of the research, from more formal (e.g., academic conferences, public meeting, textbooks) to informal activities (e.g., exhibitions, documentaries, media published, science community and societies, games, open lectures, festivals, magazine, and internet-based tools such as websites, blogs, social media, and other platforms. The process to build this information is also unique because based on the platforms and also the audience. For instance, in Indonesia, the people more like to see the video and infographic more than the text in media.

4. CONCLUSIONS

Marine debris is a global issue which requires integrated stakeholders cooperation. Scientists, students, graphic designers, communication professionals, all collaborated to communicate marine debris in scientifically accurate yet engaging and easily accessible formats. Need more trainings to the scientist how to use the media, to enhance more suitable graphics and posters for describing MD to society. It is important to provide visual information such as flyer, infographic, and short movie, and make a link to other social groups to gain more audience. PKM or dissemination is a good way to transfer the knowledge because the society nowadays more believe to science.

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