Here Comes the Sun, Here Comes the Smell

Fernalyn E. Barahim was a young councilor of Barangay Talisayan in Zamboanga City, Philippines. In her role, she was responsible for environmental and natural resources protection. Like most barangay officials, she also worked to encourage more investments and increase tourism in her barangay. As she cruised the old Talisayan highway she saw several vehicles going into Dan Mar Resort. She smiled while thinking that weekend getaways to a sea- and mountain-side resorts were a means for family and friends to get away from the hustle and bustle of city life. Talisayan had all that; it had cool, fresh air, and a soothing sea breeze. Dan Mar was the latest resort to become operational, and it had become known to residents of the city by word of mouth. Clients of the resort said that it had nice accommodations, amenities, good food, and helpful, friendly staff.

But a whiff of air suddenly made Barahim cringe. It was an unpleasant smell that she had grown familiar with, but could make visitors stay away from Talisayan. She decided to take a stroll at Dan Mar and chat with some visitors. Although some visitors had nothing but nice things to say about Dan Mar, there were other guests who complained of a fishy smell that was noticeable whenever the wind blew toward the resort's direction. These visitors also complained of the presence of flies. Barahim, like other local residents, knew that the smell came from the tuna and sardine canning factories that abounded in the Ayala-Talisayan area of the west coast of the city; locals also knew that the smell was seasonal.

Barahim was a member of the Department of Environment and Natural Resources Multi-partite Monitoring Team (DENR-MMT) and the chair of the barangay's environmental and natural resources protection committee. What could she do about the smell? She had received a little training from the DENR about how to monitor air quality, but that was just a one-day training. Although she and the barangay chair were both members of the DENR-MMT, she knew that the chair was busy with other

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concerns. It would be up to Barahim to take action to resolve the issues her barangay was facing. Was the smell from the fish factories really strong enough to keep people away? Could it affect the health and well-being of residents? Her mind raced as she thought about the various issues and competing interests within her barangay and how to resolve them.

Background

Zamboanga City was a natural docking point for vessels in the rich fishing grounds of the Zamboanga peninsula and the Sulu archipelago; the city was called the sardine capital of the Philippines. The barangay of Talisayan was located in the west coast of Zamboanga City. It was 26 km from the city proper with a population of 10,736 (2007 Census).[1] Residents earned their livelihood from farming and fishing. Talisayan was made up of six purok and one sitio, San Ramon. It was surrounded by the barangays of Ayala, Pamucutan, and Sinubong.[2]

Talisayan, along with the barangay Ayala, was host to 12 of the country's 15 fish processing factories with product lines from canned tuna to canned sardines, Spanish sardines, seaweeds, pet food, and fish meal. Canned Tuna was the main export product, followed by seaweeds and pet food. The local canning factories were compliant with the international food safety standards. Companies that were Hazard Analysis Critical Control Point (HACCP) accredited had processing plants that were clean, safe, and ensured that clean products were being processed. A canning firm that was HACCP accredited could export its products to countries in Europe, to Canada, and the Unites States.[3]

The fishing and canning industries helped the barangay in terms of providing employment for the local residents. The factories hired their personnel through the services of employment agencies, and a number of employees came from within the barangay. Some members of the barangay council wanted to see the proliferation of other businesses, particularly resorts, in the barangay.[4]

Situation

Being a coastal barangay, the area could be a good one for beach resorts. Three resorts were in the barangay: a) The Zamboanga City Special Economic Zone (EcoZone) was a government owned and controlled corporation that was developed into a self-sustaining agro-industrial, commercial, financial, investment, and tourist center and Freeport with suitable retirement and residential areas. It sat on a 664-hectare Industrial Park with a 3-km stretch of seafront, suitable for mixed-used development projects;[5] b) Victoria Farms and Beach Resort, was a privately owned resort which boasted several fresh spring water swimming pools that were entirely drained and refilled every day, which meant that they did not have to use chlorine to remain clean; and c) Dan Mar Beach Resort was the latest to be established. Its Facebook page described the place as an "oasis to relax" with cottages for overnight stays, swimming pools, and tennis courts.

What's That Smell?

Unlike Victoria Farms and the EcoZone, which were located farther away from the beach, Dan Mar was located along the beach and when the wind blew in its direction, it brought a bad, fishy smell. The presence of flies was a nuisance, especially when food had been set on the table. Dan Mar relied on word of mouth advertising and with almost everyone using social media, this information could have a negative effect on the business. The caretaker said that the smell did not seem to affect the number of

customers going to the resort, however, the smell coming from the fishmeal factories could be quite strong.

While traveling along the west coast, more often than not, one could identify that distinguishing, fishy smell. In fact, people knew that they were in the territory once they inhaled that smell. The smell came from the blood that dripped from the carriers as they made their way from the fishing vessels to the sardine factories. It was when the blood dried up that the smell became noticeable. The smell also came from the unprocessed fish. There were instances when fish catching companies or fishing vessels harvested *tamban* (herring) below standard size, which sardine canning factories did not accept as supply. This rejected harvest was then brought to fish meal companies. There were two fish meal processing plants in Talisayan. Some sardine canning factories also operated their own fishmeal factories. Sometimes it took a while until the fishmeal company was able to process the rejected catch, and it rotted in the meantime.[6]

The barangay did not reek of the fishy smell every day; rather, it was seasonal, only during the open season, which ran from March to November. The Bureau of Fisheries and Aquatic Resources imposed a ban on *tamban* fishing from November to March 2014 to make sure that the species could grow and spawn, ensuring a sustainable supply.[7] The local residents complained about the smell and the barangay officials made sure that the fish processing factories did their part in cleaning. The process of cleaning was by pouring or spraying the area with water; chlorine was also used in cleaning to remove the smell and to drive flies away.[8]

The smell was aggravated by the daily, sectional electric curtailment scheme of the Zamboanga Electric Cooperative due to a shortage of power supply from the Mindanao grid. When there was no electricity, production came to a standstill. Without electricity, proper storage through refrigeration of the fish supply was not possible.[9]

Coal Power

Talisayan had fought against the establishment of a coal power plant. San Ramon Power Inc. (SRPI) of Alsons Power Holdings would be located in the sitio of San Ramon, also in Talisayan. When fully operational, scheduled in 2016, the SRPI would be able to generate up to 100 MW of electricity for Zamboanga City and nearby areas.[10] The opposition to the operation of the power plant was primarily due to the respiratory disease that would potentially arise from the ashes. Besides, there was still the unresolved issue of where the waste materials would be disposed. The barangay wanted to make sure that nothing would be deposited into the ground or thrown into the sea. However, a number of the canning factories were now using coal-fired power. The barangay could only do so much since the license to operate was not granted by the barangay.[11]

Barahim was faced with another issue — the possibility of air pollution from coal-fired electricity used by the factories.

Philippine Clean Air Act

Republic Act 8749, or the Clean Air Act of 1999, went beyond "making the polluter pay." The DENR's primary focus was on "pollution prevention rather than on control by encouraging cooperation and self-regulation among citizens and industries." The agency along with the departments of Transportation and Communication, Trade and Industry, Energy, and local government units were tasked with enforcing a

system of accountability for adverse environmental impacts to heighten compliance with government environmental regulations. There had been indicative accomplishments in DENR's effort to improve air quality not only in Metro Manila, but also in other premier cities nationwide. The collaboration of government agencies and civil society was credited to have largely contributed to the improvement of the country's air quality.[12]

The Clean Air Act required businesses to undergo compliance testing prior to operation of establishments, with many companies having resorted to the use of alternative sources of energy that resulted in less emissions. The total suspended particulates (TSP) from 2004 of 145 micrograms/Normal cubic meter was reduced to 102 ug/Ncm in 2008, or a 30% decrease in TSP. Although there were less droplets from smoke and dust suspended in the air, additional measures were needed to further bring it down to the acceptable standard value of 90 µg/Ncm. The Environmental Performance Index which gauged how close countries were to established environmental policy goals gave the Philippines a score of 65.7 for the year 2010. This placed the Philippines 3rd in the ASEAN+3 economic region; Japan and Singapore were 1st and 2nd, respectively. The Philippines tied with Australia at 8th in the whole Asia-Pacific area.[13]

The DENR aimed to further strengthen the implementation of the Clean Air Act. The "Ligtas Hangin" campaign in 2009 was a product of its links with the Partnership for Clean Air and Clean Air Initiative-Asia Center that led to the forging of the Clean Air 10 Declaration by 300 stakeholders, empowering local government units to clean the air and address climate change through partnerships.

Coal-fired Power Plants Monitoring

Air pollution control policy was outlined in the Philippine Clean Air Act (PCAA) of 1999 and its Implementing Rules and Regulations (DAO 2000-81). This became effective in 2001 with a plan to review the act every two years, however, no review had been undertaken of the standards pertaining to coal-fired electricity.[14]

Under the PCAA, emission permits would be issued for existing and new plants. Regional industrial centers got prescribed emission quotas under its jurisdiction. However, there was no specific guidance on the process for how these allowances were to be allocated among pollution sources. The PCAA also introduced an emission charge system which included fees proportional to the amount of pollutant emitted; this was applicable to industries including coal-fired power plants. A grace period had been granted to industries while they set out to implement the necessary controls. The PCAA also provided tax incentives for plants which installed or retrofitted pollution control equipment.[15]

The air quality guidelines and standards that apply to coal-fired power generation were outlined (see **Appendices A, B**, and **C**); they included emission limits for particulate matter, sulfur dioxide, and nitrogen oxide.

Clean Water Act

The Clean Water Act of 2004 (RA 9275) aimed to protect bodies of water from industrial, commercial, agriculture, and community/household activities. It included effluent standards for water use (see **Appendix D**) that also applied to coal-fired power plants. There was no specific rule on the amount of water consumed by coal-fired plants as long as they were located near the coast and used sea water, however, they were not allowed to use ground water, and had to certify this in the Environmental Impact Assessment system of the Environmental Management Bureau.[16]

Coal Combustion By-Products

Coal-fired power plants' solid waste management was in the hands of local government units with the cooperation of the national government, non-governmental organizations, and the private sector. The Ecological Solid Waste Management Act of 2000 (RA 9003) provided guidelines and targets for solid waste avoidance and volume reduction through source reduction and waste minimization measures such as composting, recycling, re-use, recovery, green charcoal process, and others, before collection, treatment, and disposal in appropriate and environmentally-sound solid waste management facilities. The Act, however, included little guidance and monitoring for disposal of coal ash, except for the requirement that the landfills used for fly ash be lined. Fly ash could be sold for cement production, but the demand was not enough to meet supply, resulting in the remaining ash being dumped in landfills.[17]

Multi-partite Monitoring Team (MMT)

The DENR, along with the canning factories and the barangays of Ayala, Recodo, and Talisayan had established a multi-partite monitoring team (MMT) in 2014. The regional director of the DENR chaired the MMT with representatives from the canning factories and the barangay. The barangay was represented by its chair as well as the head of the environmental and natural resources protection committee of the Barangay Council. The DENR provided some training in science and environment. However, the MMT met only once since it was convened.[18]

Barangay Monitoring Team

In her desire to make sure that the companies were utilizing systems that would improve the quality of air, Barahim talked with civic leaders of the barangay. Their involvement was needed to help resolve the problem. A barangay monitoring team was created. In their discussions the group thought that one way fish processing factories could help eliminate the smell was through proper cleanliness of the factory compound. They were going to look into how factories did this in their storage areas, plants and plant equipment, transport vehicles, and processing. But what exactly should they inspect?

Arlene S. Ledesma, a resident of Talisayan who worked at Ateneo de Zamboanga University, thought that maybe Barahim could ask the university to provide the barangay with some sessions in environmental science. Ledesma sought the assistance of Katherine I. Sinsuan, a teacher of Environmental Science and Ecology from Ateneo de Zamboanga University. Sinsuan gave her an initial checklist of what fish processing factories must do to ensure that there will be no production of a bad smell.[19]

Conclusion

Barahim and the Barangay Monitoring Team faced two problems affecting air quality — the smell from the fish processing factories and pollutants from coal-fired electricity. The smell was something they might be able to work on. But if asked for alternatives such as what would be a better chemical for cleaning and deodorizing, they may not have the answers. The assistance from the university would therefore be a great help. Barahim wondered what else she would need to know about the quality of air, in particular, and pollution in general. What about the fumes coming from chimneys? Why did some release white while others black? What needed to be monitored? Could she get support and compliance

from the industries in her barangay? She needed to find answers before irreversible damage to human health occurred.

Appendix A

National Emission Standards for Source Specific Air Pollutants

Pollutant	**Plant Type**	**Maximum Permissible Limit (mg/nm3)**
Nitrogen Oxides (NOx) as NO2	Fuel Burning Steam Generators: Existing Source New Source: Coal-fired Oil-fired	 1,500 1,000 500
Sulfur dioxide (SO2)	Fuel Burning Equipment: Existing Source New Source	 1,500 700
Particulate Matter (PM10)	Fuel Burning Equipment: Urban or Industrialized Area All other areas	 150 200
Carbon Monoxide (CO)	Any industrial source	500
Mercury (Hg) as elemental Hg	Any source	5

Note: The Philippines did not have natural gas-fired electricity at the time the Clean Air Act was passed. Hence, it does not include NOx emission standards for this fuel option.
Source: The Philippine Clean Air Act of 1999. Republic Act (RA) 8749.

Appendix B

National Ambient Air Quality Guidelines for Criteria Pollutants

Pollutants	**Short Term**			**Long Term**		
	µg/nm³	**ppm**	**Ave. Time**	**µg/nm³**	**Ppm**	**Ave. Time**
Sulfur Dioxide (SO_2)	180	0.07	24 hrs	80	0.03	1 year
Nitrogen Dioxide (NO_2)	150	0.08	24 hrs			1 year
Suspended Particulate Matter:						
Total Suspended Particulate (TSP)	230		24 hrs	90		1 year
PM10	150		24 hrs	60		1 year
Photochemical Oxidants	140	0.07	1 hr			
As Ozone	60	0.03	8 hrs			
As Carbon Monoxide (CO)	35	30	1 hr			
	10	9	8 hrs			

Source: The Philippine Clean Air Act of 1999. Republic Act (RA) 8749

Appendix C

National Ambient Air Quality Standards for Source Specific Air Pollutants from Industrial Sources/Operations

Pollutants	**Concentration**		**Averaging Time**
	µg/nm3	**ppm**	**(Minutes)**
Sulfur Dioxide (SO2)	470	0.18	30
	340	0.13	60
Nitrogen Dioxide (NO2)	375	0.20	30
	260	0.14	60
Suspended Particulate Matter:			
Total Suspended Particulate (TSP)	150		60
PM10	200		60

Source: The Philippine Clean Air Act of 1999. Republic Act (RA) 8749.

Appendix D

Effluent Standards: Toxic and Other Deleterious Substances (Maximum Limits for the Protection of Public Health)

Parameter	Unit	Protected Waters Category I Class AA & SA		Protected Waters Category II Class A, B, & SB		Inland Waters Class C		Marine Waters Class SC		Marine Waters Class SD	
		OEI	NPI	OEI	NPI	OEI	NPI	OEI	NPI	OEI	NPI
Arsenic	mg/L	(b)	(b)	0.2	0.1	0.5	0.2	1.0	0.5	1.0	0.5
Cadmium	mg/L	(b)	(b)	0.05	0.02	0.1	0.05	0.2	0.1	0.5	0.2
Chromium	mg/L	(b)	(b)	0.1	0.05	0.2	0.1	0.5	0.2	1.0	0.5
Cyanide	mg/L	(b)	(b)	0.2	0.1	0.3	0.2	0.5	0.2	-	-
Lead	mg/L	(b)	(b)	0.2	0.1	0.5	0.3	1.0	0.5	-	-
Total Mercury	mg/L	(b)	(b)	0.005	0.005	0.005	0.005	0.005	0.005	0.05	0.01
PCB	mg/L	(b)	(b)	0.003	0.003	0.003	0.003	0.003	0.003	-	-
Formaldehyde	mg/L	(b)	(b)	2.0	1.0	2.0	1.0	2.0	1.0	-	-

Notes: "NPI" means new/proposed industry or wastewater treatment plants to be constructed. "OEI" means old or existing industry.
Source: DENR Administrative Order No. 35, Series of 1990. "Revised Effluent Regulations of 1990, Revising and Amending the Effluent Regulations of 1982." Accessed 10 Nov. 2015. <http://www.emb.gov.ph/laws/water%20quality%20management/dao90-35.html>.

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