

WATER POLLUTION, A CONSERVATION PROBLEM IN THE PHILIPPINES¹

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WATER pollution is an alteration of the physical, chemical and/or biological properties of any water that render such water detrimental or injurious to public health and welfare of the people and to plants and animals of the country. Webster defines conservation as being synonymous with conserving or "to keep from being damaged, lost or wasted a natural resource which is under some degree of official protection or supervision."

In presenting this short paper, it is the object of the author to emphasize the importance of conservation and conservation education to water pollution and its problem that usually occurs or happens in a developing country like the Philippines. While we can not completely avoid water pollution, we can at least minimize the occurrence. In the technology of population and settlement, the three P's — people, production and pollution — are the important interrelated factors that are involved. In a place or community where there is a large group of people the other two, production and pollution always occur. In the increase of population there is an equivalent increase in production. Waste products are produced that find their way to canals, creeks, rivers, lakes or bays polluting the waters.

The Republic of the Philippines, as of July 1, 1965, has reached the population mark of 32,345,000 people. The first four regions leading in the increased population are Southern Luzon 5,063,000 (15.7%), Eastern Visayas 4,724,000 (14.61%), Western Visayas 4,541,000 (14.1%) and Southern Mindanao 3,918,000 (12.1%). This population explosion effected the increase in number of the manufacturing industries to provide the people with their basic needs: food, clothing and shelter. It is noted that for the last ten years numerous manufacturing industries of all types have been established in the greater Manila and surrounding areas, in Cebu and Iloilo cities and in the important cities of Mindanao.

Manufacturing industries producing food and kindred products, chemical industries producing chemical fertilizers and agricultural

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chemicals such as pesticides, steel industries, oil refineries and many others that dispose their waste products into the canals, creeks, rivers, lakes, bays and seas are the principal agents of water pollution. The effects of the pollution of our waters are now felt by our people. Aquatic population in our rivers, lakes, bays and seas are diminishing or being destroyed to extinction. The stench in canals and creeks is a nuisance to the people living in the vicinities of these creeks and canals. Mining companies in full scale operation are discharging their wastes and mine tailings in the rivers that adversely affect the fish life downstreams and crops in the lowlands irrigated by these waters.

To the conservationist, water pollution is a serious conservation problem. The Department of Agriculture and Natural Resources and the Department of Health are the two government departments that are concerned with this problem. In addition to these departments the Department of Education is working hard in educating the people for them to recognize the dangers of water pollution and its effective control through different conservation practices. The wise utilization of our resources — land and soil, water, natural flora and fauna, and mineral resources — is the great concern of the government and the people. The government is doing its part through education and the implementation of the laws governing water pollution and conservation of natural resources.

GOVERNMENT RESPONSIBILITY IN WATER POLLUTION

Commission of Fisheries

The conservation of fish and fishery resources has been one of the important functions of the Philippine government since the Bureau of Science was organized in the early part of the American occupation. Charged with this responsibility was the Division of Fish and Game of that Bureau. In view of the expanded programs of fish and fishery resources conservation, this division became a bureau by virtue of Act No. 4003 known as Fisheries Act, an act approved by Congress and which became effective on December 5, 1932. This Bureau then became the Commission of Fisheries by virtue of Republic Act No. 1535 which was approved on March 20, 1963. A pertinent provision of this law that has reference to water pollution control is provided in Section 14, as follows:

"It shall be unlawful to place, caused to be placed, discharge or deposit or caused to be deposited or to pass or place where it can pass into the water of the Philippines any petroleum acid, or oil tar lampblack, aniline, asphalt, bitumen or residual products of petroleum or carbonaceous materials or substance, molasses, mining tailings or refuse, liquid or solid from any refinery gas house tannery, distillery, chemical works, sugar central, mill or factory of any kind, or any sawdust, shavings, slabs, edgings, or any factory refuse or any substance or material deleterious to fish and aquatic life." (as amended by Commonwealth Act No. 471)

The explosive increase in population of the country and the consequent demands of fish and fish products by the people are the two important factors that lead to the increased exploitation of our waters. Unless vigilant supervision and control on the utilization of these waters are made pollution is bound to occur. It is, therefore, mandatory on the part of the government authorities and the people to be conservation-wise to avoid calamity and destruction of our fish and fishery resources.

Employment of more technical men with the proper technical know-how and more funds in the conservation of our waters will conserve for a longer time the fish and fish resources of the country and support the increasing population. As U.S. President Lyndon B. Johnson has said, "we will seek legal power to prevent pollution of our air and water before it happens." Putting more teeth to our laws and more men to enforce them will in many ways, control or minimize the water pollution, pollution affecting fish and fishery resources of the country.

Parks and Wildlife Commission

The National Parks Act of 1932, designed to establish national parks and declaring such parks as game refuge and sanctuaries created the Wildlife Office. This office is now called Commission of Parks and Wildlife. The contribution of this important agency of the government in the conservation of our natural resources particularly the natural flora and fauna of the land has been praiseworthy. Due to the effective implementation of its functions and objectives, the public became aware of the Commission's existence through the well-kept and properly managed national parks.

As a result of these well-managed parks, the watershed in these areas produced abundant and clean water for the surrounding regions. The Parks and Wildlife Commission, therefore, is an instrumentality indirectly controlling or minimizing water pollution in areas where well-kept and well-managed parks exist.

National Science Development Board

The National Science Development Board is the principal coordinating agency of the Philippine government for science and technology. The Board reports from the fieldmen of the Department of Agriculture and Natural Resources, and also from the farmers, of the indiscriminate use and application to crops of agricultural chemicals causing water pollution called a conference on January 16, 1963. Ways and means of minimizing water pollution caused by these agricultural chemicals were discussed. The conference was well attended by representatives of leading agricultural chemical dealers of the country.

It was the common opinion of the conferees that when these chemicals are used indiscriminately without due regard to the instructions in the use of a product, this is bound to be dangerous to both plants and animals, including man. Suggestions were made by the representatives in attendance that the Food and Drug Act Law be re-examined for possible amendment to include provision that will control and/or supervise the sale, use, and application of agricultural chemicals being popularly applied by the farmers to agricultural crops as insecticides, fungicides and pesticides.

Water and Air Pollution Control Commission

Realizing the tremendous implication to public health, plants and animals of the country, the Congress of the Republic of the Philippines, recently enacted the law, Republic Act No. 3951, creating the National Water and Air Pollution Control Commission. This was approved by the President on June 18, 1964. Pertinent provision of the law regarding prohibition on air and water pollution is provided in Section 9 as follows:

"No person shall throw, run or otherwise dispose into any water and/or atmospheric air of the Philippines or cause, permit, suffer to be thrown, run, drain, allows to seep or otherwise dispose into such water or atmospheric air, any organic or inorganic matter of substance in gaseous or liquid form that cause pollution of such water or atmospheric air."

Violation of this provision is punishable by fine or imprisonment or both. This penal provision is one of the most important aspect of this law which insure compliance by the people responsible in polluting our water and atmospheric air.

The Republic of the Philippines being a developing country with a very high rate of population increase, registered a significant increase of manufacturing establishments in centers of population. These manufacturing firms are located, along or nearby waterways, rivers, lakes and bays where their industrial wastes are discharged. Continuous disposal of these materials certainly pollute the waters to the detriment of the aquatic population in these waters. In addition to the extinction of the fish life, the stench developed makes living in the neighborhood uncomfortable.

The enactment by Congress of the Water and Air Pollution Control Commission is considered one of the best pieces of legislation ever made during the decade. The Commission is now in the process of organization and will immediately operate and implement the provisions of the law as soon as funds for its purpose becomes available. This Commission is under the supervision of the National Science Development Board.

CONSERVATION IN POLLUTION ABATEMENT

Conservation of our natural heritage — land and soil, water, forest, grassland, wildlife and minerals — must be recognized by our people as a fundamental necessity if we have to survive and enjoy life in this country. On these natural resources our people depends at all times for their food, clothing, shelter and the raw materials for our industries and business activities. In the past and even to the present we have been lavish with these resources.

Conservation and the Constitution

The framers of the constitution of the Republic of the Philippines provided under Article XIII — Conservation and Utilization of Natural Resources, the following:

"All agricultural, timber, and mineral lands of the public domain, waters, minerals, coal, petroleum, and other mineral oils, all forms of potential energy, and other natural resources of the Philippines belong to the State, and their disposition, exploitation, development, or utilization shall be limited to the citizens of the Philippines or to corporation or association at least sixty per centum of the capital of which is owned by such citizens, subject to any existing right, grant, lease, or concession at the time of the inauguration of the Government established under this constitution. Natural resources, with the exception of public agricultural land, shall not be alienated, and no license, concession, or lease for exploitation, development or utilization of any of the natural resources shall be granted for a period exceeding twenty-five years, renewable for another twenty-five years, except as to the water supply fisheries, or industrial uses other than the development of water power, in which cases beneficial use may be the measure and the limit of the grant."

While many are aware of this provision, the rest of the Filipinos do not realize its importance to the future generations. The unwise exploitation of these resources are already showing signs in the form of major floods and consequent drought in regions where none occurs before. Accelerated soil erosion have already depleted our cultivated soils, filled up our stream channels rendering them unnavigable and our water reservoirs making them decrease in water capacity. The healthful and pleasant weather which our forefathers enjoyed before has already changed. Our wildlife population have already decreased, our grassland heavily grazed and our forest trees cut down wantonly.

However, government bureaus and agencies have been trying a herculean job of minimizing the destruction of these resources. As funds are made available, technical men with proper technical know-how are employed and immediately put to work. Considerable progress in many areas with conservation program have already been made.

Bureau of Soils

The most important fundamental work of this bureau is the general classification of the soils of the country. The latest report of

the Bureau of Soils Director indicated that 25,843,624 hectares representing 86.2% of its total area have been surveyed. Presently a United Nations Special Fund project in this Bureau is in the third year of implementation conducting general soil fertility survey for major crops of the country.

The erosion survey by provinces are also being conducted simultaneously with the general soil classification and land capability surveys. These and other data gathered by the burueau will provide the people of the country, particularly the farmers, proper guidance in the proper utilization of our soil resource for crop production and other uses.

In the proper utilization of the soils, however, there is great need of educating the people especially the farmers. The soil reports, as published by the bureau, are written in plain language that the layman can understand. The extension division of the Commission of Agricultural Productivity of the Land Reform Administration disseminate these informations to the farmers.

Bureau of Forestry and Reforestation Administration

The work of these two government agencies complement each other. One of the most important work of the Bureau of Forestry is to determine the boundaries of forests and declare which should be permanent and which can be disposed of. The Reforestation Administration with its bold program of reforestation of all deforested areas has made great progress. If adequately financed and works continue every year, there will be no water shortage and pollution problem in the future for domestic, irrigation, industrial power and recreational uses. Accelerated erosion will be minimized, thus water pollution through silting is controlled. If the Bureau of Forestry will think twice before releasing or approving logging permits and, enforce the policy of selective cutting, there will be less cut-over lands and less deforested area for the Reforestation Administration to cover the already wide areas of deforested regions.

Bureau of Mines

The mineral resources of the land by law belongs to the State. The Bureau of Mines which is concerned with the conservation of mineral resources of the country is deeply involved in the water pollution problem due to the disposal of mine tailings in the operation of gold mining companies. An example of this problem is The Silt Situation in the Agno River Below Binga Hydroelectric Project.³ The sources of mine

³ Title of the report prepared by Messrs. Conrado A. Fontañes and Hilario G. Mariñas, Bureau of Mines on the investigation of the water pollution of the Agno Irrigation System by mill tailings from different mines in Baguio District.

tailings are the wastes disposed into the tributaries of the Agno River by the milling plants operated by the Baguio Mining Co., Benguet Consolidated, Inc., Itogon Mining Co., and the Philex Mining Corporation. These wastes ultimately find their way into the irrigated areas served by the existing Agno River Irrigation System of the Bureau of Public Works, now the National Irrigation Administration. Also, as expected by the National Power Corporation, these wastes later will also find their way into the reservoirs and turbines of the four hydroelectric plants proposed for construction in the Agno River below the Binga Plant.

For better understanding of the problem of mine tailings pollution, the estimated amount of tailings thrown into the Agno River for 1959 operation is shown below:

MINING COMPANY	Total Tailing	-200 Mesh (ton) estimated	+200 Mesh (ton)
1. Philex Mining Corp.	549,134	332,531	216,603
2. Baguio Gold Mining Co.	142,290	99,603	42,687
3. Benguet Const. Inc.	1,221,000	769,230	451,770
4. Itogon Mining Co.*	180,000	52,920	31,080
TOTAL	2,092,424	1,254,284	742,140

* only 84,000 tons thrown into creek, the rest used for slope fillings

The authors indicated that assuming that only 5% of the -200 mesh is carried down to Pangasinan (the level areas) during the dry season and 50% during the rainy season the estimated seasonal tailings are:

Dry season tailing carried to Pangasinan	664,250 tons
Wet season tailing carried to Pangasinan	998,210 tons

In addition to the mine tailings there are sediments from natural erosion. The authors indicated the following results of investigations.

NATURAL EROSION SEDIMENTS CARRIED TO PANGASINAN

Season	Iron Watershed above Ambuklao* (tons)	Iron Watershed below Ambuklao (tons)	Total Sediments (tons)
Dry	11,134	205,151	216,285
Wet	178,866	3,295,273	3,473,589

* Ambuklao is one of the hydroelectric power projects just above Binga project in the Mountain Province.

It is observed that, there are more erosional sediment than mine tailings brought down the river every year. However, it was noted that there are more mine tailings deposited on the farm than the erosional sediments because small amount of water from the Agno River flows to

the farm areas during the wet season of the year, the time erosional sediments is at the greatest amount.

There is no doubt, therefore, that there is a need of examining the methods and technique of the Gold Mining Companies in this area regarding the mine tailings disposable to minimize silting and sedimentations of our stream channels and agricultural land. Fertile rice lands in Pangasinan are covered with these sediments that render the soil unproductive. The author in conducting the soil survey of Pangasinan province in 1935 at the height of the mining boom, remembered going through a rice field covered with one foot of sand presumably from mine trailings. Even with irrigation water the rice plants did not show a good stand.

Parks and Wildlife Commission

Few have realized the important work of this commission in abating water pollution through vigilant implementation of the law that created the office. There are about 42 national parks in the Philippines as proclaimed by the President of the Philippines. More areas should be proclaimed specially those public areas near the centers of population.

The wildlife of the country is fast disappearing due to the people's ignorance of the balance of nature principle and the lack of appreciation on the beauty of nature. The early education of our children in private and public schools about nature is a must in the high school and college level. Course in the conservation of natural resources in high school and college levels were recently recommended by the National Research Council of the Philippines to the Secretary of Education. Concurrently with this recommendation was a manpower development program for teachers and professors to teach the subjects in conservation of natural resources. For the present, technical men in the bureau and offices of the Department of Agriculture and Natural Resources, the National Irrigation Administration and the National Power Corporation can, if required, handle the building-up of these teachers and professors.

S U M M A R Y

Water pollution in the Philippines is a conservation problem. The rapidly increasing population of the country and the rapid and unceasing utilization of the natural resources to provide raw materials for increased production of consumer goods, result in a way to the pollution of our waters.

However, government agencies like the Department of Agriculture and Natural Resources, Department of Public Works and Communica-

tion and the Department of Education, realizing their responsibilities in natural resources conservation have made programs geared to the wise utilization of the natural resources of the Philippines. Conservation education is a part of the curricula of the lower grades and it is expected that in the near future this subject will be one of the courses in the high school and college levels.

The Bureau of Soils, Forestry, Mines and the Reforestation Administration are making progress in their conservation of soils, trees, grasses, and mineral resources with the aim in view of minimizing adverse effect on water resources. Parks and wildlife commission with its limited financial and technical facilities had made substantial progress in keeping national parks in good shape.

In spite of all these progress there is still plenty of room for the improvement of these services. Greater success in the implementation of effective conservation measures is needed in the abatement of the water pollution in this country.

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