

## THE MOST VALUABLE NATURAL RESOURCE OF THE PHILIPPINES

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A forest is more than a biological system. It is a complete ecological system by itself. As such, it gives man more benefits than we can imagine.

The most valuable natural resource of the Philippines is its forests. Our forests outweigh all the combined values of all the other resources like fisheries, mineral deposits (gold, silver, copper, etc.) and even the most recently discovered *black gold* or oil deposits on the ofshores of Palawan and other parts of the country, because forest resources, if managed properly, are renewable. They can be regenerated, while the others, especially the mineral deposits, outlive their usefulness the moment the deposits are consumed. The forests contribute greatly to nation-building and its economic stability, not only in the form of their tangible, but more importantly their intangible treasures.

Now it seems that I am presenting my ideas in reverse, that is, revealing the ending of the story even before I have made its introduction. Let us first discuss, therefore, what a forest is, what its components are, and how these components interrelate by themselves into a complete ecological system and somewhere at the end of this discussion, find out how this system benefits man himself. Before doing this, let me first relate two little anecdotes to drive home a point:

In a barrio somewhere in this country, there was once a farmer who had a son, a fifth grader in the elementary school. One day, the boy came home from school and asked his father what a

forest is, how it looks like and how it benefits man. Apparently, this boy was given an assignment by his teacher to write a theme about the forest. Wise as he was, the father pointed to the nearby woods and said, "Son, this coming Saturday, I want you to go there and see what you can find. Observe. When you return, I expect you to be able to know what a forest is."

And so, to cut the story short, the son went and came back more bewildered than before. When his father asked him, he scratched his head and said, "Papa, I am sorry, I did not find the forest, because there are so many trees," That is how we are, we think of the forest as JUST TREES.

Another story is that of the five blind men. When asked by their master to describe an elephant, the first blind man who happened to touch the tail of the elephant said that the elephant is just like a rope — a stout and big rope. The second blind man who happened to embrace the leg of the elephant opined that the elephant is like a big, big post — a giant pillar. But the third, having felt the side of the animal described it as a wide, wide wall. The fourth, who happened to hold the ear of the elephant said, "Master, an elephant is like a giant fan." Finally, the fifth blind man described the elephant as "an extra-large fireman's hose." He happened to hold the trunk of the elephant.

Now, many of us are like these five blind men. We only ascribed to and describe the forest based on what we see, and perhaps hear, or experience. We see the pieces, the parts, but, we have failed to assemble them together for a holistic perspective. Why? Is it because we know so little about it that we don't care? Is it because we have been seeing it there, existing on the mountainsides, that we take it for granted?

Let us see if the forest deserves to be treated miserably like this — that of being taken for granted. Like the five blind men, let us make a few more steps farther, put all the components of the forest together and see what kind of view we can develop out of it.

A forest is a community of plants and animals, composed predominantly of trees, living on a wide tract of land, and having a

distinct microclimate of its own. So now we have the three basic parts:

1. Plant and animal life, with trees predominating in size and number;
2. A vast tract of land where these plants and animals live; and
3. A distinct microclimate as a result of the presence of the plants and animals in the area.

The first part let us divide into plant or vegetative component and the animal life component.

### **Vegetative Component**

As we have already mentioned, the forest is predominantly trees — big trees, small trees, even seedlings. Of course, there are other plants of smaller sizes and may be less in number. These are the vines, the shrubs, herbs, and even grass, as well as saprophytic and parasitic plants.

### **Animal Component**

Of the animal life, we have the deer, rodents, reptiles, birds, even earthworms as well as micro-organisms.

The vegetative components as well as the animal components of the forest community make up the so-called “live” components of the system. These “live” components live in the air, on the surface of the ground, under the ground and in bodies of water.

### **Inert Component**

The soil, rocks, leaves, twigs and broken branches that have fallen to the ground, decaying bodies of dead animals and animal droppings compose the inert or “non-living” part of the forest.

The presence of the vegetative and animal life on the surface of a vast tract of land produces a distinct kind of micro-climate on the said area. An example of this is the difference in temperature that you can feel on a warm noonday when you walk across the grass in a golf course into an orchard or a clump of trees.

That all of these living and non-living things that make up the forest, as a whole, are existing on a "give-and-take," live-and-let-live interrelationship is quite obvious. Trees and other plants in the forest do not only provide food for the animals that are living there but also homes, hiding places and venues for them to perpetuate their kind. In return, these animals help fertilize the soil. Micro-organisms break down the leaves, twigs and branches into humus, thereby adding not only fertility to the soil but also improving its water-holding capacity. This is why, in the forest where there is plenty of humus and litter, the top soil is almost always moist. Animals, as they feed on the fruits of trees help its propagation and dispersal by spreading the seeds that do not get digested in their stomachs.

Plants, in the process of photosynthesis give out oxygen which is used by the animals, while animals, as they breathe in oxygen exhale carbon dioxide which in return is used by the plants in the process of photosynthesis.

The existence of the forest benefits man tremendously. The forest tempers the climate in the areas that surround it. This is why, in place where there are forests, the fluctuation of temperature is not so much. Temperature extremes are minimized—the forests and its vegetation acting as the "shock absorber." If the sidewalks of Manila are only lined with trees, they would not be as warm as they happen to be. Besides, they will also be refreshingly beautiful.

Let us not go far from the MSU campus. Looking out of the window, we marvel at the beautiful lake before us. As we all know, the source of the water that fills this lake are the big and small rivers that originate in the mountains that surround the lake. There are about 30 rivers in all — all of which flow into the lake. Now, just try to imagine what will happen if suddenly all of these

rivers will run dry. What will happen to the lake? Of course, it will run dry too. And if this happens, what will be the fate of the fish — the “kadorog,” the “tumaginting” and all the other species of marine life that are living in the lake? They will all disappear and become extinct. Now, is this not a terrible thing to happen?

On top of this, what will happen to the generating units of the National Power Corporation? You see, this is a chain reaction of events, and the final shock absorber and hapless victim of all of these series of unfortunate events will be man, himself, and that means you, and me — all of us. Now you ask, “What is the connection between the conditions of the forests on the mountains and the drying of the lake?”

Let me invite you to the mountains. Let us have a mental excursion to the slopes of the “Sleeping Lady” and see what we can find there. If we explore under the trees in that forest, we shall see that on top of the soil, there are dry leaves, branches and twigs that have fallen from the trees. Some of these are still intact. We call these undecomposed materials *litter*. Underneath the litter, we find that some of the leaves, twigs and branches are partially or fully decomposed. We call these materials *humus*.

Now where does the water come from? Of course from the rain. As the rain falls, the raindrops fall on the branches and leaves of the trees and these raindrops slide down the trunk or stem of the trees until finally they reach the surface of the soil. The rainwater is absorbed by the litter and the humus and passed on down the soil.

The soil in the forest is porous. It has plenty of macroscopic and microscopic holes into which water can get in and flow down to the bosom of the earth. This downward travel of the water into the soil goes on and on until it reaches an underground body of water called the water table.

This water table is connected to openings, usually on the sides or heads of creeks and rivers, where the crystal clear water comes out. These openings are called springs. The springs are the main sources of the water that are flowing on the rivers. The source of the water supply on the spring is the water table and the

source of water in the water table is the forest.

Usually, it takes a long time for the rain water that sweeps on the surface of the forest soil to reach the water table and eventually out of the spring. Some take as long as six months. So, you will notice that the forest does not only help to store the water in its porous soil but also regulates the flow of water. In other words, it "budgets" the water supply that flows into the rivers. Forests assure constant flow of water on rivers, even during the dry months of the year.

This time, let us compare. Let us take a look at another mountainside that does not have trees and forest on it. When it rains, the raindrops strike the soil directly. As a consequence, the soil gets loosened. The water flows down the mountainside straight to the river. It carries with it particles of soil. These particles of soil are deposited on the beds of the river making them shallow. When the river bed becomes shallow, it cannot contain heavy volumes of rain water during strong rains, so that the results are floods. Worse than this, the excess soil is carried farther by the river current and deposited into the lake, making the lake shallow. If this goes on, time will come when the lake we have now will be filled with soil and there will be no more space for water. The lake will eventually disappear.

This is just an example of what the forest does for us. Let us look a little bit deeper. All the so-called eleven basic needs of man are directly connected to the forest. These basic needs are as follows: water, power, food, shelter, clothing, health services, education and culture, ecological management, sports and sanitation, mobility, and livelihood and economic base. Let us now see why this is so:

## **Water**

Life, be this plant or animal, cannot exist for a prolonged period without water. No water, no life. This is a basic earthly truism. Our body is approximately 90 per cent water. We must

constantly supply our body with water so that it will be able to function normally and properly. Plants need water to carry nutrients from the soil to the leaves so that it can manufacture its own food. It also needs water so that the manufactured food can be distributed to the different vital parts of the plant.

We need water to cleanse ourselves and our things. We need water for industrial purposes. We need water for a hundred different purposes and in a hundred different ways. Have you read about the prediction of Paul Dixon? He is an avid researcher. He has predicted that by the year 1980, water will become more and more difficult to obtain; by the year 2000 water shall be a precious commodity.

As we have mentioned earlier, water in the lake is very important in generating power for the hydroelectric installations of the National Power Corporation. The water in the lake, for as long as the rivers feed it with sufficient volume of additional water, has the potential power value more than the oil wells of the Middle East. It is a fact that oil wells do not last more than twenty years and they run dry. In the case of our lake, for as long as we can take care and maintain the productive conditions of its watershed, water will always be available for centuries to come.

As a power-generating force, it is many times over more useful than oil or any of its numerous petrochemical derivatives. For as oils are used, they serve only once. Once they undergo the process of combustion, once they are burned, then that is the end of their usefulness. Not so with water power. As you will see, the same water is used to run the series of hydroelectric units all the way down the Agus River.

## **Power**

We need power in a countless different ways. We need it to light our homes, cook our food, keep our machineries running to perpetuate and improve our industrial outputs. This second basic human need must be made available to all at a reasonable price.

Again, it appears that electricity is the most logical choice here. The cheapest way, and so far the best way, to generate electricity is by use of water — water in the lake that originates from the forest.

In addition to this, while providing water for electrical power generation, still poles can be harvested from the very same forest and can be used as power transmission posts to bring the electrical commodity to the places where they are needed.

## Food

There are countless plants that are to be found in the forest that give us food in the form of fruits or some of their vegetative parts. Wildlife, like the deer, and other game animals have always been hunted for food. Likewise, in agriculture, especially in the culture of rice, bumper crop production will be difficult to attain without irrigation. Here is another connection of the endless use of water that we have just mentioned in the previous item, that of the generation of electricity. After the water has passed the last installation of hydro-electric generation unit, the same water can be channeled to the lowland to irrigate our ricefields.

In the forest, nature has provided a delicate “check and balance” system—that of prey-predator relationship. Many of the natural enemies of the pests that destroy our agricultural crops stay in and come from the forest. Birds feed on the worms and rodents that destroy our crops.

At this point, we find a practical application of Biology. This is where the forest plays a vital role. As mentioned earlier, the forest provides habitat for wildlife, especially the birds. The birds keep the number or population of insects in constant check, by feeding on them. If the insects multiply, there becomes more and more food for the birds, and so the birds become fat and they multiply too. You will notice that the prey-predator relationship is constantly maintained, and this will remain as such provided man does not come in to interfere or disrupt this delicate balance. Once man tips this balance to one side, then the trouble begins. If

he kills more birds, the insects will have more chance to multiply, unchecked and the result is infestation.

### **Shelter**

Everyone is aware that a lot of the components of our buildings, be these our houses, offices and other forms of edifices, are made of wood and other forest products that come from the forest. Almost all furniture are made of wood, or at the least, wood derivatives. The roofing materials of most of the houses that we find in the barrios are made of nipa and nipa is a forest product.

In line with the government's desire to provide decent homes for everyone, the use of locally available materials for construction becomes more in demand.

### **Clothing**

Many of the synthetic fabrics that are in the market today come from plants. An example of this is rayon — such as found in socks. Silk comes from silkworm that feeds on the leaves of mulberry trees. And of course, there are cotton, ramie and many others.

### **Health Services**

Many of the medicines that are used today, whether these are scientifically prepared like the ones that we buy from drugstores, or the ones that are used by the "herbolarios" come from the forests. If you recall Second World War, you will also remember how a lot of people, especially the soldiers and the guerillas, were saved from the deadly malaria by drinking water boiled with the bark of cinchona trees. At present, the Biology Department is conducting a survey of medicinal plants that are commonly used

by people around the lake and it will be no surprise if many of these plants come from the forest.

In addition, the forest by itself can help in the faster recovery of convalescent patients. Its quiet and serene atmosphere helps patients recover their health faster — by relaxing their nerves and giving them respite from the tensions of the ratrace in the cities.

### Education and Culture

With regard to education and culture, how can these two important undertakings of a country be achieved without that valuable material called paper — paper, on which the fruits of man's philosophy, his scientific findings, the history of his race and nation, and other countless important things and events are permanently recorded for mass communication, instructions and for posterity?

As civilization dawned upon him, man began etching his ideas on the walls of his dwelling — the cave. But that, of course, was not enough. He stumbled upon the use of animal hides and later on, the papyrus. Finally he discovered the manufacture of paper and together with the birth of this wonderful material came the rapid improvement of man's culture, his education, his progress, his modernization.

It is now a recognized fact, that paper is being used as an economic index. This idea presumes that the more a nation uses paper and paper products per capita, the more advanced that particular country is — not only economically, but also, educationally and culturally. And to these, allow me to add one more thing, advancement in sanitation. Along this line, statistics reveal that our country is one of the tailenders in the paper consumption (per capita) in the world. This perhaps explains why we are economically, culturally and educationally behind the other nations.

## **Sports and Recreation**

A lot of sport activities can be conducted in the forest. These are hunting, mountain climbing, orienteering, etc. It has now become a fad for city dwellers to go on weekened picnics in the forests. For the people of the Metro Manila, Los Baños, Tagaytay, Mount Arayat and Pagsanjan Falls are their favorites.

And for lovers, the woods are just as inviting to get lost into for recreation.

## **Ecological Management**

We have mentioned earlier that the forest and by this we are referring to the trees and other plants— gives oxygen which purifies the air and counteracts pollution. The crystal clear water that springs out from the bosom of the mountains cleanses the pollution in our rivers.

With the advent of industrialization, man pays dearly in terms of impaired health due to air and water pollution. If you are not yet aware, it is one of the findings in a nationwide pollution survey that Iligan City is the second most polluted city in the Philippines—second only to Metro Manila. This is because of the mushrooming of factories, left, right and center of the city of Iligan. People are happy because of added job opportunities, but if you will carefully observe the area along the road in the municipalities of Manticao and Luga-it, then you will have an idea of the price that the people there are paying for progress.

If you noticed the dusts that are gathered on the leaves of the trees, especially the coconut palms along the road in those areas, then it will not require added imagination for you to estimate the amount of pollutants that are being belched out by the chimneys of those factories. It is just lucky for them that there are trees that arrest a part of these dusts on their leaves. Had it not been for these trees, the conditions could have been worse. It could have been unbearable.

The same case happened in a place called the Rhur Valley in the heart of Germany. This is a mining and industrial district. During World War II, Germany had to rely very heavily on this place for the production of iron and steel which are the basic raw materials for the manufacture of its armaments, like tanks, battleships, planes and others.

As a result, the mines and factories in the Rhur Valley had to be operated on a 24-hours-a-day seven-days-a-week basis. The resulting air and water pollution was no less than catastrophic. Almost all of the people in the area complained of respiratory trouble.

To remedy this situation, the German government had to create instant forests around the factories and at the entrances of the mine tunnels. Workers had to take turns to get away from their work and run to the trees for a breather, after which, when they felt better again, they would return to their places of assignment to continue their work.

### Mobility

Perhaps, you will say that forestry has no business in the matter of mobility, for the term suggests transportation and when we think of transportation, we think of diesel oil and gasoline. Maybe so. But how about water transport? Take for instance the case of Lake Lanao. This lake links all the shoreline municipalities to each other and with the City of Marawi. It is a very good thoroughfare. It functions just like a road, perhaps even better than a road.

And do you know how much it would cost to build a kilometer of road these days? Approximately P 50,000 per kilometer. And this is just to build not the first class concrete road, not even the asphalt road but only the ordinary gravel or McAdamized road. How about the road maintenance – and the cost of bridges both big and small? Considering that Lake Lanao has a shoreline of 124 kilometers, the road alone, minus the bridges, minus the maintenance, would reach up to a staggering amount of P 6.2 bil-

lions. This is the amount that this body of water is saving for us. Now, does not the lake contribute to mobility? And did we not point out how the forest has contributed to making the lake?

Secondly, if that body of water were not present, and if we were to run the turbines and the generators that provide electricity for the entire Island of Mindanao with diesel, how many hundred barrels of fuel do you think would we be using each day? This cost is being saved for us by the lake. Besides, with the advent of more and more water and air pollution consciousness, moves are now in progress towards the use of electrically propelled vehicles like the pre-war "tramvias" in the City of Manila, the streetcars of San Francisco (USA) and Toronto (Canada) as well as the commuter trains. As educated forecasts go, even the ordinary family car of the future shall run on rechargeable batteries.

Even if we say, just for the sake of argument, that we have succeeded in building all the roads needed and have struck it rich in a bonanza of oil deposits, would we consider our problems of mobility already solved? The answer, I am afraid, would still be "no." Let us not forget that our country is in the path of tropical torrential rains. We are in the typhoon belt. This simply means that without forests to control and mitigate the destructive effects of floods, we shall always have roads and bridges that shall be washed away every year. This does not only mean costly repairs—it also means loss of lives and property—it also means paralysis of transport, next-to-zero level of mobility and delay of trade and industry.

### **Livelihood and Economic Base**

Of the total land area of 30 million hectares that comprise the Philippines, roughly 48 per cent of this is forestry in nature. This is due to the almost rough terrain of our country. Under this, must come the benefits, goods and services that must redound to the well-being of man, that of the Filipino.

To appreciate all of these good things that nature itself can

**give us, a good understanding of Biology is necessary. One must be aware of the intricate interdependence of all the components, for as the saying goes: "one is useless without the other."**