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December 28, 2014

Foz de Iguacu

Ten percent of freshwater found in the world is found in Brazil. If the potential of water could be harnessed, by hydroelectric technology, energy demands could be met without costly fuel imports. Hydroelectric dams generate Ninety percent of Brazilian’s energy. A hydroelectric dam works by dropping water into turbines, and making them turn at great speed to create electricity. The taller the dam, the greater the drop, the more power is produced. The Itaipu Dam is a hydroelectric dam on the Parana River located on the border between Brazil and Paraguay. The Parana River is the seventh largest in the world and holds four times the amount of the Colorado River! A challenge they faced was trying to find a river that could support such a large amount of water. It must flow thru narrow banks and the bedrock must be strong enough to take the massive weight of the dam walls. Another problem they ran into was that a vast area of forest would need to be flooded to feed the monster dam. This means that thousands of people would lose their homes and the habitat for thousands of animals would be lost forever. The government had to get an accurate evaluation of the area and the homes; everything was recorded and photographed, even belongings. They had to relocate families, some were given money while others were given similar property elsewhere. As for the wildlife, they surveyed the wildlife in the area that was going to be flooded and relocated many of the animals. Although seven hundred kilometers of the forest disappeared in the valley flooding, millions of new saplings were planted along the reservoirs edge.

The builders of the dam ran into another problem. The bedrock was soft and not good for a foundation so they needed to fill the cracks with extra strong concrete. Also, to minimize erosion of the foundation, they created something like a ski jump for the water to flow off from. This dam took nine years of grueling work to complete. People worked in two shifts of twelve hours for almost 365 days a day. The completed dam is twenty two times bigger than Niagara Falls! The Itaipu Dam now feeds the energy of twenty four million Brazilians.

From the waters of the Yangtze River in China comes the biggest concrete structure on the planet. The massive structure has taken forty thousand workers and seventeen years to build and is twice the size as the one in Brazil. It is over two kilometers long and sixty stories tall and produces twenty thousand mega watts of power. The dam also sits on one of the busiest rivers in Asia. Similar to the Itaipu Dam, they had to divert the Yangtze River and move over one million people from the area that was about to be flooded. There are thirty-two generators that power the dam, each costing about fifty million dollars. Just one machine makes as much energy as a small nuclear power plant. And all thirty-two generators make enough electricity for sixty million Chinese. Similar to Brazil, the Three Gorges Dam had a problem with their foundation. They used a pipe network that went into the riverbed with little holes on the side of them that was connected with a high-pressure pump. In the pump there was a watery grout that consisted of cement and water. When the grout is dry, it creates an impermeable barrier in the soil. Also, because they had a problem with the heat and the concrete, they used a fog spray to blow a fog blanket over the top of the dam to block solar radiation.

Similar to the Itaipu Dam’s problem, if the water fell straight down it would mess up the foundation. So they decided to hurl the water into the air so the water would break into small droplets and lose most of its destructive energy. The Three Gorges Dam was built primarily to prevent flooding however it has caused many problems for people that relied on the flooding. The farmers downstream are suffering because their land is lacking nutrients that they usually got from the floodwater. Also, the dam blocks the precious silt. The silt then gets trapped and sinks to the bottom. When this happens, it could build up in the reservoir and threaten the dam itself. And if it came up high enough, it could affect the turbines. To avoid this problem, they installed gates that flush out the sediment. Aside from all of the downfalls, the Gorges Dam provides cheap and clean electric power to millions of people.

The Grand Coulee Dam is a dam on the Columbia River in the state of Washington. It is the largest in the west and catches all of the snow and rain. When the stock market crashed, the large economic crisis brought a renewed prospect on large irrigation projects. According to the Public Works Administration, the president was authorized to spend at his discretion 3.3 billion dollars on new infrastructure projects around the country. The president promised that the dam was going to produce many jobs. More than one thousand and two hundred men worked in continuous shifts. They made about seventy-five cents per house and did get breaks. Once the dam was finished, a total of seventy-two men had died on the project.

Similar to the Three Gorges dam and the Itaipu dam, the Grand Coulee Dam also tried to minimize the damage to the foundation and created something that would hurl the water into the air. The Grand Coulee dam was built with no disregard for the Indians as human beings. The dam had severe negative consequences for the local Native American tribes whose traditional way of life revolved around salmon and the original habitat of the area. The dam permanently blocked fish migration and they were unable to spawn. There were many negative comments about the dam but after the attacks on Pearl Harbor people starting thinking differently. That dam’s turbines helped power a third of the planes used in World War II. In Portland, the dam’s power put seven hundred and fifty big ships on the high seas. Despite some setbacks, the Grand Coulee Dam made cities thrive, it created metropolitan areas and fueled the suburban revolution.