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Assignment 1

Question 3: Analyze the impact of Fukushima’s wastewater to the environment, the social perception of the company/country. What are the alternatives?

In Japan, because of the earthquake, some of the units in the Fukushima Daiichi Nuclear Power Plant stopped working without electricity and were destroyed on the building structure. At the same time, due to the loss of cooling effect and to avoid further explosion, the water reacted with the radiated reactor and was released into the atmosphere and the Pacific Ocean. This was the first type of wastewater we have to consider. Another type of wastewater is treated and diluted wastewater which is planned by the Japanese government to release into ocean or be allowed for drinking. These two types of wastewater would affect the environment and the social perception of the country.

As for the untreated Fukushima’s wastewater, more than sixty types of chemicals and radiated substances were found. Some of them are harmful to the environment or even to human bodies. For example, Strontium-90 is a high-risk radiated substance. Once it is absorbed by biology or living organisms, its DNA double-strand would be broken (Musilli, Nicolas, & El Ali, 2017). Basis gene structure was destroyed which would result in human death or even failure of reproduction. One common disease is bone cancer. Because of its high water-solubility and high half-life period, it could present in environments and be continuously entering the food chain. Also, other harmful substances like Carbon-14, Cesium-137, Iodine-129, and Cobalt-60 would have similar radiated properties. The significant impact is that these substances could enter and destroy the formation of protein, nucleic acid, or even DNA. And, Because of the death of the cell and potential genetic mutation, in the short-term, animals and plants died rapidly, and the rest of living animals would be rich in radiated chemicals. In the long-term, it is possible to become extinct in the related ocean. Therefore, polluted water brings immeasurable impacts on the environment.

Considering the wastewater that was already released, although some of the neared or affected locals could live in temporary houses and receive some support either physically or mentally, unnumbered people lost their home, jobs or even their life. They became nearly hopeless. It damaged to the basis of Japanese society. Moreover, social-related number like mortality rate would increase. Also, at the same times, Japanese government and the related company acted to blockade the affected area and cover some of the related news to public. After a few years, the government admitted some of the radiated water had already been released to atmosphere and ocean. The action is losing the trust of public. And, it shows a notification that health problem would be a important considerable issue living in Japan. People would consider to leave from and live forever in other countries. It affects the society significantly.

Apart from the untreated wastewater, Japanese government claimed that all radioactive substances could be removed from the treated wastewater through Advanced Liquid Processing System (ALPS) technology, excluding one which is called tritium. Although tritium is radioactive, it could be diluted into an extremely low percentage with water. And, the treated wastewater is going to be released to ocean. However, releasing any amounts of radiated substances is still meaning to releasing radiated substances. The risk of radiation could not be considered as none. Another essential issue is huge amount of wastewater still have not been treated through ALPS. Also, the containers that are storing different mixed radiated substances. This becomes difficulty for the ALPS. In fact, the amount of wastewater was continuously increasing because of the radiated reaction. Once the wastewater does not be treated well and released to ocean. The impacts to the environment would like the release of treated wastewater which is discussed above. Biology or living organisms would become the biggest losers in this case.

Considering as social perception, Japanese government would further lose its effect to public. There are some reasons. From the previous cover of release of untreated wastewater, the government has already lost the trustworthiness. Also, generally, people would have a cogitation that likes to choose the way does not have any loss. They would like to say no to the plan that even have a really small percentage causing failure. In fact, treated wastewater must contains radiated substance which is still being possible to have the radiated effects. And, not only releasing to ocean, but the treated wastewater is also planned as drinking water. Therefore, people would like to reject releasing of treated wastewater and feel disappointed to the government. Moreover, government still hided the progress and did not provide clear timetable of treatment of radiated wastewater through ALPS. This action was like the previous cover action. It would further lose the trustworthiness of public and be challenged. Once the government enforced to release the treated wastewater, its trustworthiness and impact to society would be further destroyed. People would consider choosing a better place of other countries to live because of the clean water or the trustworthiness. This is an essential impact of Fukushima’s wastewater to the social perception of Japan.

Based on the above situation and impacts, considering to future, Japanese government would have two alternatives. One is to use evaporation method of wastewater. The radiated substances would become concentrated and be small amounts. It would be easier to store. Then, an area would be found to place containers that are storing high risk radiated wastewater at a safe place that does not being lived by people and animals. This would solve the above problems because the radiated substances would not be released into the ocean or even be exposed. The drinking water is still being clean. It eliminates effects to the environment and the relieves impacts to social perception of Japan.

Another method is still releasing the wastewater to ocean, but government has to behave honestly. For example, government has to show clear schedule for progress to public to increase the trustworthiness. Otherwise, it would stay at the dead position in social perception of country. As for environmental impact, it becomes uncertainty because government has to show that all untreated wastewater is treated through ALPS. On the contrary, environmental impact has already in dead position and could be solved.

All in all, Fukushima’s wastewater brings negative effects to either environmental issue or social impact of Japan unless Japanese government has to use above alternative.

Reference

Musilli, S., Nicolas, N., El Ali, Z. et al. DNA damage induced by Strontium-90 exposure at low concentrations in mesenchymal stromal cells: the functional consequences. Sci Rep 7, 41580 (2017). <https://doi.org/10.1038/srep41580>