International Network for Government Science Advice

INGSA CASE STUDIES

Pulpinea

Pulpwood crisis: A potential trade-off between biodiversity & the economy

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Background and context

Pulpinea is a South Asian country with a population of 120 million people. National growth across all sectors has been increasing over the last decade; with an average annual GDP growth above 7%. Life expectancy is 72.3 years; and continues to increase every decade. With increased prosperity, people's buying capacity has also increased; resulting in greater consumption. One of the biggest economic contributor in Pulpinea is the paper-based industry that creates significant number of jobs and products used domestically and exported to neighbouring countries. At present, the Pulpinean paper industry is completely dependent on imported pulp. Pulpinea imports its pulp primarily from its neighbouring country, Moringa. Both these countries are currently in a long-standing maritime dispute over ownership of an island. As a result, the government of Moringa has threatened to stop the export of pulp to Pulpinea which will result in a complete shutdown of the Pulpinea paper industry. This will result in a serious negative impact on the local economy. This is not the first time, Moringa has threatened Pulpinea with cutting pulp supply. Thus, the Government of Pulpinea has been trying to find ways to source pulp locally.

The Pulpinean Chemical Industries Corporation (PCIC) is a government-funded organization that manages the industrial sector in the country. In fact, PCIC has played a vital role in the pulp and paper industry in Pulpinea. The biggest pulp and paper industry is the Pulpinea Newsprint Mill (PNM). The mill used to utilize Gewa (*Excoecaria agallocha)* wood from the Pulpinean region of Mangrovia since the 1950s. Mangrovia is the world's largest mangrove forest; 60% of which resides in Pulpinea and 40% in Moringa. The Mangrovia forest is situated on the Southwest coastal areas and it is the largest forest in Pulpinea. The Mangrovia forest is one of the richest biodiversity hotspots in South Asia. It is home to an estimated 425 species of wildlife, including 400 species of birds and mammals, including the endangered national animal and symbol of pride, the Royal Pulpinean Tiger. Mangrove forests are an important breeding ground for many fishes, crabs, prawns and other marine animals, essential for sustaining a viable fishing industry. Mangrovia's mangroves are more diverse than those in tropical Africa and the Americas. The rivers, canals, creeks *etc*. spread across Mangrovia like a net with their innumerable branches. Mangrovia houses a network of 300 large and small rivers that provides a major source of fresh water in Pulpinea. The forest also acts as a buffer to protect the coastline against cyclones, rising sea tides and other hazardous natural events.

In recognition of its rich biodiversity and its ecological importance, UNESCO declared Mangrovia as a world heritage site in 2000. As a result, the supply of Gewa wood was stopped and the Pulpinea Newsprint Mill was shutdown. At its peak production, the mill was

able to produce 40% of the pulp needed by the Pulpinean paper industry. As a result of its shutdown, Pulpinean complete dependence of Moringan pulp continues today.

The coastal areas and offshore islands suffer from flooding and cyclone severely almost every year. In order to protect the coastal and offshore areas from the cyclone, storm surge inundation and salt-water intrusion, mangrove afforestation was initiated along barren shoreline and offshore islands. The initial plantings proved highly successful in protecting and stabilizing the coastal areas, and led to a large-scale mangrove afforestation initiative that was partially funded by the World Bank. To date, approximately 100,000 ha of mangroves have been planted. Local scientists have developed nursery and planting techniques for the major species, while additional species are still being investigated.

The Government of Pulpinea believes that it is important that the coastal plantation efforts not only mitigate loss of lives and property from cyclones and tidal surges, but also generate employment opportunities through the production of wood for consumption. Therefore, commercially important mangrove species, such as Keora (Sonneratia apetala), Gewa (Excoecaria agallocha), Avicennia officinalis, A. marina, A. alba, Amoora cucullata, Bruguiera sexangula, Xylocarpus mekongensis, Heritiera fomes, Ceriops decandra and Nypa fruticans were planted. Of them, Keora proved to be the most successful one. At present, this plant constitutes about 94.4% of successful mangrove plantations. Keora is now the main species in the coastal region of Pulpinea. These trees are now completely matured. At present this species has no industrial or any other applications. However, as a result of the extensive mono-specific plantations, outbreaks of two major insect pest species have been observed. A Royal Pulpinean Tiger was also killed during one of the recent replantation efforts. The long-term effects of the introduction of these trees on the overall mangrove ecosystem are also unknown.

Based on research by local Pulpinean scientists, wood from the Keora species has been proven to be a very good source of raw material for the pulp industry. Research results show that the pulping behavior of Keora and Gewa are almost similar. Therefore, the utilization of Keora as a pulping raw material can solve the problem of pulp procurement of the Pulpinean paper industry and reduce the dependency of Moringan pulp; allowing the Pulpinean government to take a stronger stand in future diplomatic discussions with the Moringan government. The PCIC has also recently completed a preliminary feasibility study on the production of pulp from imported bamboo chips from another neighbouring country, Kalinga. Pulpinea and Kalinga share very strong diplomatic relationship and will provide another solution to reduce over-dependency on Moringa pulp. However, Pulpinea will need a long-term agreement with the Kalingan government for sustainable and uninterrupted supply of raw materials for the pulp and paper industries in Pulpinea.

Recently, a news portal latched on the story of the killed Royal Pulpinean Tiger and this has resulted in a nation-wide outrage. A couple of international environmental NGOs have also voiced their concerns of the Keora coastal plantation efforts and have suggested that extensive research needs to be conducted before further afforestation efforts are continued. They claim that more efforts should be done to encourage paper recycling and reduction of consumption. They threaten to lobby the UNESCO to revoke its recognition as a world heritage site.

The prime minister of Pulpinea is feeling under immense pressure and asks you, as his Science Advisor to advise him on what should the Pulpinean government do; with regards to developing a strategic plan that protects the biodiversity of Mangrovia while also securing the Pulpinean economy.

What considerations do you need to bear in mind in doing so? Note: this question is not only about making a specific recommendation but rather about the process and considerations in doing so.

Notes for mentors

Perspectives from the various stakeholders from whose perspective should/may be considered:

1. Pulpinean Government
2. Individual Ministers (Industry; Forest; Foreign Affairs)
3. Forestry / Environment Department
4. PCIC
5. Tourism agency
6. Local and Foreign investors
7. Regional authorities, e.g. in the northeast, in the river plains,
8. Scientists
9. Environmental NGOs
10. Media
11. Local communities
12. Kalingan Government

Considerations:

1. Must protect biodiversity in Pulpinea. Are there any alternative wood resources for pulp production? Are there non-world alternatives? What about recycling?
2. How to deal with media and international pressure?
3. The optimum solution for the raw material crisis is to use raw material of Pulpinea derived from the replantation efforts, but it must be sustainable and ecologically balanced; with long-term research/monitoring efforts.
4. In confronting the raw material crisis, first there needs to be an understanding of the elements of decision-making that are not based on scientific evidence (e.g. international relations—with the neighbouring countries, economics and media portrayal) and those that are based on science; such as the feasibility of the solutions and the impact on the environment, biodiversity.