

## **Protection and Conservation**

One measure to help mitigate the negative impacts of deforestation in tropical rainforests is through protection and conservation of the rainforests. Conservation refers to protecting the environment and its natural resources from harm. It involves maintenance, restoration and wise management of resources to avoid permanent depletion. Protection of forested areas refers to the setting of laws to protect an area from unfavourable activities which may endanger the biodiversity and natural resources found in that area. Activities that do not damage the forest environment like ecotourism, are allowed and encouraged. The culture and traditions of the indigenous people would also be preserved. Therefore, protected lands can be used for educational purposes, scientific research and ecotourism, and allow the future generations to continue to admire the diverse biodiversity in the ecosystem. An example is the Betung Kerihun Nature Reserve which was set up in 1992. It is home to a diverse range of animals such as the orangutans, honey bears and gibbons. This nature reserve also extends into Brunei and Malaysia and is referred to as the 'Heart of Borneo'. The World Wide Fund for Nature is working closely with the three nations to increase protected areas and manage the reserve sustainably in a joint effort to protect the reserve. Therefore, the protection and conservation of rainforests helps to minimise loss of biodiversity, indigenous communities and their culture as well as other negative impacts of deforestation that damage the forest environment.

## **Reforestation and Afforestation**

One measure to help mitigate the negative impacts of deforestation is reforestation and afforestation. Reforestation is the process of planting trees in areas where the deforestation has taken place. Afforestation refers to the process of planting trees in areas that were not originally covered with forests. Reforestation provides many benefits such as an increase in wildlife habitat, clean and abundant water. Reforestation also has a faster radius of effect over a larger land area. As for afforestation, it creates new carbon dioxide sinks which helps to decrease the amount of carbon dioxide in the environment. This will lead to reduced global warming. For example, there have been some reforestation projects in the Amazon rainforest in which organisations partner with local communities. One such project is Reforestation in Peru, organised by a company called LATA (Latin America Travel Association) Foundation. LATA Foundation buys seedlings from various stakeholders and pays local communities to plant trees. By acquiring this strategy, a large amount of the money goes back to the local communities. As a result, a total of 70,000 trees were planted in 2011. This helped to reduce the amount of carbon dioxide in the atmosphere and lessen the effects of global warming. Therefore, Reforestation and Afforestation can improve soil fertility and in the long term, it can ensure a continuous supply of essential products and may help to sustain plant growth in the area, making it one of the mitigation measures for deforestation.

## **Public Education**

One measure to help mitigate the negative impacts of deforestation is public education. Public education allows people of all ages and from all walks of life to understand deforestation and the negative impact it has on the environment. Public education will spread awareness of the severity of deforestation, convincing the people to change their consumption habits to conserve the forests such as purchasing eco-friendly products and promoting selective controlled logging, with the ability to reach a larger group of audience. After receiving public education, people would have changed views towards deforestation and this would decrease deforestation rates, as they know about the harm brought about by deforestation. One example of public education would be the embassy of Brazil in Singapore launching an exhibition about the Amazon rainforest, titled Amazonia in Singapore in 2009. The exhibition showcased the biodiversity of the rainforest and raised awareness of management and conservation strategies. Gigantic panels, photographs, videos and installations gave visitors a multi-sensory experience of the rainforest. Photographs of indigenous communities and artefacts helped visitors understand the lifestyle of the people and how the forest provides for them. Therefore, if people understood more about the forest and how deforestation harms the environment, they would be actively against deforestation. Hence, public education is a useful mitigation strategy as it does not force people to abide by laws, but instead turn environmental awareness into their own mindset and help them to be more appreciative of the rainforests and help to be against deforestation.

## **Controlled Logging**

One measure to help mitigate the impacts of deforestation is controlled logging. Controlled logging refers to the careful management of forests that are being logged. It allows logging only in certain areas and in a sustainable manner. Several ways to control logging would be to impose fines or other forms of punishment on those who carry out illegal logging. Education and research programmes might also be arranged to inform timber companies of the damage caused by deforestation and discuss measures to take to manage the extent of the damage. This encourages people to cut down lesser trees. Another way to control logging is to reduce the impact of logging by cutting down selected species of trees. Logging companies also can still get their timber needed sustainably and countries that rely on selling forest products still can have a source of income. An example of controlled logging would be a programme started by the Brazilian Institute of Environment and Renewable Resources, where every tree that is cut down is accounted for.. This prevents the total clearance of a forest. Studies have found that reduced-impact logging can be used to reduce carbon emissions by up to 40 tons per hectare of forest compared to conventional logging. This, combined with the preservation of higher levels in biodiversity in selectively logged forests, lends a strong case to sustainable forest management over standard timber-harvesting techniques. Therefore, controlled logging can help to mitigate the impacts of deforestation.

