

Advertorial

Biofuel: A ray of hope for Sri Lanka's energy crisis

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Sri Lanka is currently in the midst of an economic and energy crisis. Due to a rapid surge in commodity prices and a fuel shortage, tens of thousands of people wait for hours outside fuel filling stations. For public transportation and thermal power generation in the country, diesel is the second most used fuel behind gasoline. As a result, the fuel issue directly impacts the Sri Lankan transportation system and electrical power generation.

The power crisis is at its peak now, where many people face long periods of power outages on a daily basis. Sri Lanka, which is still fighting for funds to import enough fuel, declared ten-hour daily power cuts across the country last week, which officials claim is the country's most prolonged period of power cuts in more than 25 years.

Apart from interfering with daily activities at home, the extended power outages have strained businesses such as shops, malls and restaurants, especially at a time when authorities are frantically attempting to boost tourism post-Covid pandemic.

The main reason for this was the rise in global prices as well as the devaluation of the Sri Lankan rupee versus the dollar following the government's decision on March 7, 2022 to allow the currency to float freely. As a result, the state-owned Ceylon Petroleum Corporation (CPC) has increased the price of 92 octane petrol to Rs.338 per litre, an increase of Rs.84, the price of 95 octane petrol to Rs.373 per litre, an increase of Rs.90, the price of Diesel to Rs. 289 per litre, an increase of Rs. 113, the price of Lanka super diesel to Rs. 329 per litre, an increase of Rs. 75 bringing it in line with the per litre price charged by Lankan Indian Oil Company (LIOC).

This was the second price increase by CPC in less than a month, whereas the LIOC's price increase last week was the sixth in less than six months.

Sri Lanka spends approximately 500 million USD each month on fuel purchases. Early in February, India and Sri Lanka struck an agreement under which India would provide 500 million USD in assistance to the



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island nation in order to aid it with gasoline imports. An 80,000-metric-ton (MT) shipment of petroleum from the Indian Oil Corporation arrived in Sri Lanka on February 15, 2022. By the end of February, the administration was having trouble coming up with 35 million USD to pay for another 40,000-tonne consignment of fuel. According to the Monthly Economic Indicators of the Central Bank of Sri Lanka for February, the Ceylon petroleum cooperation sold 220,000 MT of Diesel to consumers in January 2022. Because of this, Sri Lanka imports approximately 6 billion USD worth of crude oil, refined petroleum, and other petroleum-based products each year. This is a significant percentage of money when compared to the annual costs.

Biofuels: An alternative solution?

Much study has been done on alternative energy sources due to environmental concerns, rising costs of petroleum goods and a diminishing supply of fossil fuels. Decision makers worldwide are paying attention to biofuel because of its renewable nature, lower carbon footprint and biodegradability.

Many people believe that biodiesel is an environmentally friendly and renewable alternative to petroleum-based Diesel. Biodiesel is preferred by countries worldwide because of its renewable, biodegradable and low-emission characteristics. Due to the chemical and physical similarities between biodiesel and petrochemical diesel, it is possible to utilise it directly in diesel engines without changing their current layout.

Biodiesel derived from waste cooking oil (WCO) has been successfully developed by researchers at the Department of Civil and Environmental Technology, Faculty of Technology, University of Sri Jayawardenepura. According to the laboratory testing results, the quality of the biodiesel met the ASTM D6571 inter-

national standard. Senior Lecturer, Dr. Udara S.P.R. Arachchige; Senior Lecturer, Dr. Randika A. Jayasinghe; Senior Lecturer, Dr. Nuwan A. Weerasekara; M. Phil Student, K.A. Viraj Miyuranga and Research Assistant, Manoj Balasuriya are the members of the study team.

Biodiesel Production

Transesterification is considered the most common way of producing biodiesel from edible or non-edible oils. In this process, vegetable oil, which consists largely of triacylglycerols, is reacted with low molecular weight alcohol with the support of a catalyst to produce biodiesel and glycerol.

The economic feasibility of biodiesel depends on the availability of low-cost feed stocks. One way of reducing biodiesel production costs is to use cheap raw materials. Several types of non-edible oils, waste vegetable oils and animal fats are widely used in biodiesel production. There are several oils available in Sri

Lanka. However, edible oils should not be used for biodiesel production as their consumption value; market prices will increase. Therefore, biodiesel production mainly focuses only on non-edible oil.

The production cost of one litre of biodiesel is around 200 rupees. The majority of the cost involves the raw material cost. However, if we produce B20, which is 20% biodiesel and 80% petroleum diesel, we can replace 20% of the petroleum diesel with biodiesel. Then to produce 1 L of B20 blend, 20 Rupees can be saved. Besides that, biodiesel can be produced locally and does not use up the foreign currency. If we consider the waste cooking oil generated by the well-known restaurant chains, there is a possibility of 8000 Tonnes of biodiesel production locally.

Vehicle Testing

Fuel consumption of biodiesel was tested for a diesel three-wheeler. The 30 kilometers travel with 1 litre of biodiesel has been recorded.



National Park: A centre for recreation or a complex of city buildings?

The World Conservation Union (IUCN) defines a 'protected area' as 'an area of land or sea especially dedicated to the protection of biological diversity and nature associated cultural resources, and managed through legal or other effective means'.

The Convention on Biodiversity defines it as 'a geographically defined area which is designated or regulated and managed to achieve specific conservation objectives'. The two definitions are not in conflict although the IUCN definition refers more directly to the economic ('resources') and cultural aspects of conservation. A protected area by definition should be secured from unrestricted use of its resources. Accordingly, National Parks are managed mainly for ecosystem protection and recreation.

National Parks and their functions

Scholars mentioned that the



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functions of national parks could be compared to the functions served by different buildings in a city (Table 1).

This analogy is useful because it emphasises the many different roles played by protected areas and helps people understand that they are not 'single-use', a common criticism



from industrial interests when park designations are suggested.

Tourism in Wildlife Parks

Tourism in a wildlife park should be subordinate to the main objective of wildlife conservation. The primary responsibility of wildlife tourism should be to promote awareness amongst the general public on the need for wildlife conservation. Since our wildlife habitats are comparatively small, having varying degrees of protection, it is not possible to develop tourism on a large scale in these areas without disturbing the habitat. Hence, it becomes essential to restrict tourism activities to a smaller zone, causing minimal disturbance to the wild animals. The accommodation and the office complex for tourism should be in natural settings, in tune with the habitat, preferably outside the park boundary. For creating awareness amongst the public, park interpretation centres, guide



service, reading material and facilities for conducted treks inside the habitat should be provided.

Objectives of National Park Recreation

The term 'recreation' sometimes has connotations which are incompatible with the objectives of a national park or wildlife sanctuary. Tourism management in national parks and other protected areas has the following objectives:

- To maximise people's enjoyment of their stay through education and recreation;
- To minimise the impact on habitat and wildlife;
- To increase the visitor's concern for nature conservation.

In addition, another objective that policy makers hope to achieve via parks is an increase in government revenue. National parks have been charged with the dual mandate of maximizing people's desire for quality recreational enjoyment during their stay via education and opportunities for protecting park resources. Therefore, the ultimate goal of tourism management, recreational planning and visitor services management is protecting natural resources while providing a high-quality visitor experience. Education and interpretation of park resources are part of the over-

Table 1: Functions of a National Park Delineated via Analogy with City Buildings

Building	Function
Art Gallery	Many parks were designated for their scenic beauty, which is still a major reason why people visit parks;
Zoo	As one component of the art gallery, parks are usually easy places to watch wildlife in relatively natural surroundings. Most park wildlife are protected from hunting and are not as shy of humans as wildlife outside parks;
Playground	Parks provide excellent recreational settings for many outdoor pursuits;
Movie theatre	Like a movie, parks are able to transport us into different worlds and settings;
Cathedral	Many people derive spiritual fulfillment from nature, just as others go to human-built structures, such as churches, temples and mosques;
Factory	Parks create jobs and add revenue to national income;
Museum	Parks protect the landscape and serve a valuable ecological function as they provide important areas against which to measure ecological change in the rest of the landscape;
Bank	Parks are places in which we store and protect our ecological capital, including threatened and endangered species;
Hospital	Ecosystems are not static and isolated phenomena but linked to support processes all over the planet. They may be considered ecosystem 'hospitals' where air is purified, oxygen is produced, and ecosystems are recreated;
Laboratory	As relatively natural landscapes, parks provide outdoor laboratories for scientists to unravel the mysteries of nature;
Schoolroom	Parks can play a major role in education as outdoor classrooms.

(Source: Dearden & Mitchell, 1998)

all tourism management effort. 'Interpretation' helps to increase public support for wildlife conservation by creating understanding and fostering awareness and the concern among tourists with respect to conservation needs and by enhancing visitor satisfaction through knowledge enhancement. Accordingly, National Parks can be considered as the centres for recreation functioning as a complex of city buildings.

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