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INDIA

# India's pioneering role in promoting biofuels in South Asia

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**Shishir Joshipura**

Shishir Joshipura is MD &amp; CEO Praj Industries.

## Introduction

In recent years, the world has witnessed a growing need for sustainable energy sources to combat climate change and stop deteriorating environmental conditions. Today, the world is shifting pavements from non-renewable sources of energy to renewable energy sources. Among all renewable sources of energy, Biofuels have emerged as a viable and sustainable alternative to fossil fuels, offering a way to reduce greenhouse gas emissions and mitigate the effects of

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climate change. This has been instrumental in triggering a gradual shift from a hydrocarbon-based economy toward a carbohydrate-based economy.

Recognizing the importance of this renewable energy source, India has taken significant strides in promoting biofuels, not only within its borders but also across South Asia. As a regional leader, India is playing a pivotal role in encouraging the adoption and production of biofuels, driving the transition towards a cleaner and greener future.

### Unique Geographical Advantage

The South Asian subcontinent comprises of countries such as Afghanistan, Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan, and Sri Lanka. South Asia is blessed with fertile lands and a favourable climate for agriculture. The region boasts vast stretches of arable land that can be utilized for cultivating crops such as sugarcane, jatropha, palm, and various oilseeds. South Asia exhibits diverse climatic conditions, ranging from tropical to subtropical and temperate zones. It is known for its rich biodiversity, numerous plant species and diverse crop cultivation. The region possesses significant water resources, including rivers, lakes, and rainfall patterns that support agricultural activities.

South Asian subcontinent encompasses a unique ecosystem consisting of an enormous labour force, proximity to

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markets with arrays of research and development institutes; backed with flourishing agrarian economy making it an ultimate destination for Biofuels production.

### **Glocal Collaboration and Knowledge Sharing**

India's leadership in promoting biofuels has not been limited to its own borders. The country has been actively working to encourage the adoption of sustainable energy practices. India has been sharing its expertise and experience in biofuel production and utilization with its neighboring countries in South Asia. Recognizing the importance of regional cooperation, India has initiated progressive steps to foster the growth of the biofuel sector in the region. The South Asian Association for Regional Cooperation (SAARC) has played a vital role in facilitating this cooperation, providing a platform for member countries to exchange knowledge and best practices. India has been an active member of the International Bioenergy Forum (IBF) and has been contributing to global discussions on sustainable biofuel production, trade, and policy.

India has signed a series of bilateral agreements with countries in South Asia to promote the production and use of biofuels through partnerships and collaborations. In 2019, India and Nepal signed a Memorandum of Understanding

(MoU) to promote cooperation in the development of biofuels. The MoU aims to facilitate the exchange of information and expertise between the two countries and to promote the use of biofuels in Nepal.

Similarly, India has also signed an MoU with Sri Lanka, Maldives, and Bangladesh to collaborate in the field of biofuels. The MoU aims to establish a framework for cooperation between the two countries in the areas of research and development, capacity building, and exchange of technology and expertise. India's engagement through these engagements reflects its commitment to a collective effort in addressing climate change and reducing carbon emissions on a global scale.

### **Advancing Biofuels Production**

India has recognized the vast potential of biofuels and has undertaken significant efforts to bolster their production. India's commitment to biofuels can be traced back to its National Biofuel Policy, which was first introduced in 2009 and subsequently revised in 2018. The policy aims to create a favorable environment for the development and utilization of biofuels by providing incentives and support mechanisms. It sets ambitious targets for blending biofuels with fossil fuels, with the goal of achieving 20% blending of ethanol by 2030.

The National Policy on Biofuels, introduced a new category called

'Advanced Biofuels,' encouraging the production and use of second-generation biofuels. These advanced biofuels, produced from lignocellulosic biomass, and agricultural & forestry residues, offer even greater carbon savings and promote sustainable land use practices by providing an alternative to stubble burning.

Similar efforts for the promotion of compressed Biogas have been instrumentalized under the SATAT policy. This policy framework has laid the foundation for India's robust biofuel industry and has been instrumental in driving innovation, research, and investment in the sector. This triumphs India's dedication to reducing carbon emissions and promoting sustainable energy alternatives.

### **Investments in Research and Development**

India's commitment to biofuels is further demonstrated by its substantial investments in research and development (R&D) in this field. The research studies focus on improving various aspects of biofuel production, including feedstock cultivation, conversion technologies, and efficient utilization of biofuels. The Indian government, in collaboration with academia and industry, has established dedicated research centers and

laboratories to facilitate R&D activities in the bioenergy sector.

India's pioneering efforts in biofuel research and development have been instrumental in advancing the sector. The Indian Institute of Petroleum (IIP), Indian Institutes of Science Education and Research (IISER), National Chemical Laboratory (NCL), and the Council of Scientific and Industrial Research (CSIR) have been at the forefront of biofuel research, focusing on technologies for efficient conversion of biomass into biofuels and developing novel feedstocks. These initiatives have led to significant advancements in biofuel production processes, resulting in improved efficiencies, cost-effectiveness, and environmental sustainability.

### **Socio-Economic-Environmental Benefits**

India's promotion of biofuels brings about numerous social, economic, and environmental benefits. By reducing dependence on imported fossil fuels, biofuels enhance energy security and contribute to a more sustainable and self-reliant energy ecosystem. The cultivation of biofuel feedstock crops creates new income opportunities for farmers, stimulates rural development, and helps alleviate poverty in agrarian communities.

Furthermore, the use of biofuels reduces greenhouse gas emissions, mitigates air pollution, and helps combat climate

change. As a clean and renewable energy source, biofuels play a vital role in India's efforts to achieve its climate commitments under the Paris Agreement. The widespread adoption of biofuels in South Asia can collectively contribute to a significant reduction in the region's carbon footprint, benefiting both the environment and public health.

### **Challenges and Way Forward**

Despite its successes, India faces several challenges in promoting biofuels in the region. One of the main obstacles is the lack of adequate infrastructure for the production and distribution of biofuels. To address this, India has been investing in building new biofuel refineries and upgrading existing facilities.

Another challenge is the availability of feedstock crops. While India has made significant progress in promoting the cultivation of biofuel feedstock crops, there is still a need for greater research and development to identify crops that are better suited for local conditions. Additionally, there is a need to balance the use of land for biofuel production with food security concerns.

The challenges still exist in the widespread adoption of biofuels in South Asia. Limited availability of feedstocks, inadequate infrastructure, and technological barriers pose significant hurdles. Therefore, it is essential for

countries in the region to collaborate, share experiences, and invest in research and development to overcome these challenges and unlock the full potential of biofuels.

## Conclusion

In conclusion, India's pioneering role in promoting biofuels in South Asia is a testament to its commitment to sustainable development and energy security. Through robust policies, a strong agricultural base, research and development efforts, and regional cooperation, India has made significant strides in driving the adoption and utilization of biofuels. By supporting the growth of biofuel industries in neighboring countries, India contributes to energy security, poverty alleviation, and a cleaner environment. As the region continues to focus on transitioning towards a greener and more sustainable energy future, India's leadership in promoting biofuels serves as an inspiration and catalyst for other nations in South Asia.

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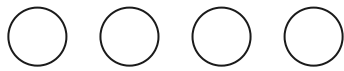
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