RESOURCE EFFICIENCY - Key To A Sustainable Future

Using the resources efficiently to produce more while utilizing less has been one of the tested and trusted ways for a sustainable future. It not only ensures the security of the resources but also minimizes the environment impact. In order to ensure that the two ends meet, NITI Aayog in collaboration with the European Union delegation to India and the Confederation of Indian Industries, CII released the first ever Strategy on Resource Efficiency for India which also included an action plan for promoting resource efficiency in India.

What is Resource Efficiency

Resource efficiency is a strategy to achieve the maximum possible benefit with least possible resource input. Fostering resource efficiency aims at governing and intensifying resource utilisation in a purposeful and effective way. Such judicious resource use brings about multiple benefits along the three dimensions of sustainable development - economic, social and environmental.

Objectives of Resource Efficiency

1. Resource efficiency is a strategy to achieve the maximum possible benefit with least possible resource input.
2. Resource efficiency aims at governing and intensifying resource utilisation in a purposeful and effective way.
3. Judicious resource use brings about multiple benefits along the three dimensions of sustainable development - economic, social and environmental.

Resource efficiency encompasses various areas, such as:

1. Using natural resources as efficiently and productively as possible – creating more with less
2. Moving from the use of non-renewable resources to using renewable resources
3. Taking environmental aspects into consideration early in the product design phase
4. Reducing the environmental footprints of products
5. Increasing the recyclability of products and raw materials

Key Concepts and Indicators of Resource Efficiency

1. Resource efficiency at the country level is usually measured with material flow indicators.
2. Material flow indicators measure total material use or relevant components of material use of a country.
3. Due to the large scale of its use, water is not included.
4. Gaseous substances are taken into account only by a few countries.

The following raw material groups are distinguished:

1. Biotic raw materials: food and animal feed, fibres, timber, etc
2. Fossil resources: oil, gas, coal
3. Metallic raw materials
4. Non-metallic mineral raw materials: construction minerals, industry minerals

Highlights of the RE Strategy

The Resource Efficiency Strategy includes the core-action plan for the period 2017-2018 and medium-term action plan for 2017 – 2020 with the following key elements:

1. Institutional development including setting up an inter-departmental committee and Task force of experts.
2. Capacity development at various levels for strengthening of capacities and sharing of best practices.
3. Development of an indicator monitoring framework for baseline analysis.
4. Launch of Short term course on RE under the MHRD GIAN Programme.
5. Promotional and regulatory tools in selected sectors (automotive and construction) such as Ecolabeling for Secondary Raw Material (SRM) products, recycling standards, R&D and Technology Development,

Sustainable Public Procurement, development of Industrial clusters and waste-exchange platform, information sharing & awareness generation along with development of sectoral action plans.

Some Examples of Resource Over-exploitation in India

1. The main raw materials that are used in the production of cement are limestone, gypsum and sand.
2. Cement companies are already facing dwindling reserves for limestone and import dependencies for gypsum.
3. Sand is a resource in high demand from the construction sector; an estimated 1.4 billion tonnes of sand will be required by 2020, compared to 630 million tonnes in 2010.
4. Sand mining is dominated by small actors with a high incidence of illegal mining.
5. Due to environmental bans and restrictions, supply and consequently prices of sand have been affected in many parts of the country.
6. Manufactured sand (m-sand) has become a thriving industry in some parts of the country; however, virgin granite resources are used as feed stock in the process.
7. Soil is primarily used by the brick kiln industry for production of clay bricks, and also for road construction as base material. Since soil mining is dominated by the unorganised sector, unchecked mining is rampant, negatively affecting agricultural productivity in areas with significant brick production.

Adverse Impact of Resource Exploitation

Impact on Economy

1. Tripling domestic resource extraction of biomass, minerals and fossil fuels will be linked to increasing pressure on natural resources such as land, forest, air and water.
2. Imports of materials face severe constraints: import dependencies and costs for imports would increase.

Social Impact

1. India’s mineral rich areas are under dense forests and inhabited by indigenous communities.
2. Extraction pressures have contributed significantly to conflicts due to displacement, loss of livelihood.
3. It has also led to opposition by tribals and other local communities including fishermen in Andhra Pradesh.
4. Social and political conflicts pose significant threat to internal security.

Impact on Environment

1. Mining of materials contributes to land degradation and loss due to open cast mining, excavation, stacking of waste dumps, discharge from workshops and construction of tailing ponds.
2. Mineral rich areas overlap with heavily forested areas in the country.
3. Around 60% coal resources are located in forest.
4. By 2025, area under extraction for coal mining would increase from 22,000 hectares to 73,000 hectares.
5. This will increase pressures on the forest, pollution of water bodies and land degradation.
6. Since our energy system is dominated by fossil fuels, resource extraction contributes to significant GHG emissions.
7. Minerals industry contributes to around 32% GHG emissions of India.
8. In 2007, CO2 emissions were to the tune of 131 million tonnes from mineral industry, metal sector contributed about 122.7 million tonnes of C02.
9. Iron & steel, cement plants, sulfuric acid manufacturers, smelters of copper, zinc, lead ore etc. are significant contributors of CO2 and SOx.
10. Brick kilns are important sources of air pollution and CO2 emissions.

Benefits of Resource Efficiency

Economic Benefits

1. With increasing resource efficiency, GDP per tonne of material used will be increased.
2. Resource Efficiency has the potential to improve resource availability that is critical to the growth of industries.

3. By using resources more efficiently, or by utilizing secondary resources, industries can improve competitiveness and profitability.
4. RE-based innovations can also give industries an edge in the export market, as the experience of global leaders such as Germany and Japan has shown.
5. New industries can be created including those in the recycling sector, as well as in innovative design and manufacturing.
6. India can aspire to become a key innovation hub for RE
7. Reduced import dependence for critical minerals helps to improve the country's trade balance and promote economic stability.

Social Benefits

1. Adoption of Resource Efficiency (RE) strategies have the potential to reduce conflict and displacement in mining areas.
2. It can also improve health and welfare of local communities.
3. It can also contribute to improved affordability of and access to resources critical for poverty reduction and human development.
4. It has enormous potential for job creation in the recycling sectors.
5. It can create high skilled jobs in innovative design and manufacturing.
6. RE strategies contribute towards preserving resources for future generations.

Environmental Benefits

1. Reduced extraction pressures due to adoption of RE strategies will help to reduce ecological degradation and pollution associated with mining.
2. Reduced pressures from mining will provide opportunities for undertaking landscape restoration and regeneration of degraded mined areas.
3. Reduced waste generation will lead to less pollution associated with disposal.
4. Resource extraction and use is highly energy intensive.

Government of India's Policy for Resource Efficiency

At the mining stage, the National Mineral Policy includes zero-waste mining as a national goal and emphasizes the need to upgrade mining technology.

At the design stage, policies like the National Housing and Habitat Policy, 2007 and the Pradhan Mantri Awas Yojana (PMAY), 2015 emphasize on developing appropriate ecological design standards for building components, materials and construction methods.

At the manufacturing stage, flagship programmes like "Make in India" that provide special assistance to energy efficient, water efficient and pollution control technologies through Technology Acquisition and Development Fund (TADF) also promotes resource efficiency.

In case of end-of-life stage policies, there are policies to tackle all types of waste ranging from hazardous waste to Municipal Solid Waste (MSW), Construction and Demolition (C&D) waste, plastic waste and e-waste. Ministry of Environment adopts eco-labelling scheme. Waste and pollution reduction through adoption of RE approach can also contribute positively to the Swachh Bharat (Clean India) and Ganga Rejuvenation missions.

On India's 68th Independence Day, PM Modi urged the industry, especially the MSMEs of India, to manufacture goods in the country with "zero defects" and to ensure that the goods have "zero effect" on the environment. If we want a future, which is beautiful and ecological sustainable, then we all must strive for resource efficiency.