VIGYAN 2047 Volume 2 No. 8 August 2025 Pages 31–33

Many Shades of Green

From Sustainability to Symbolism

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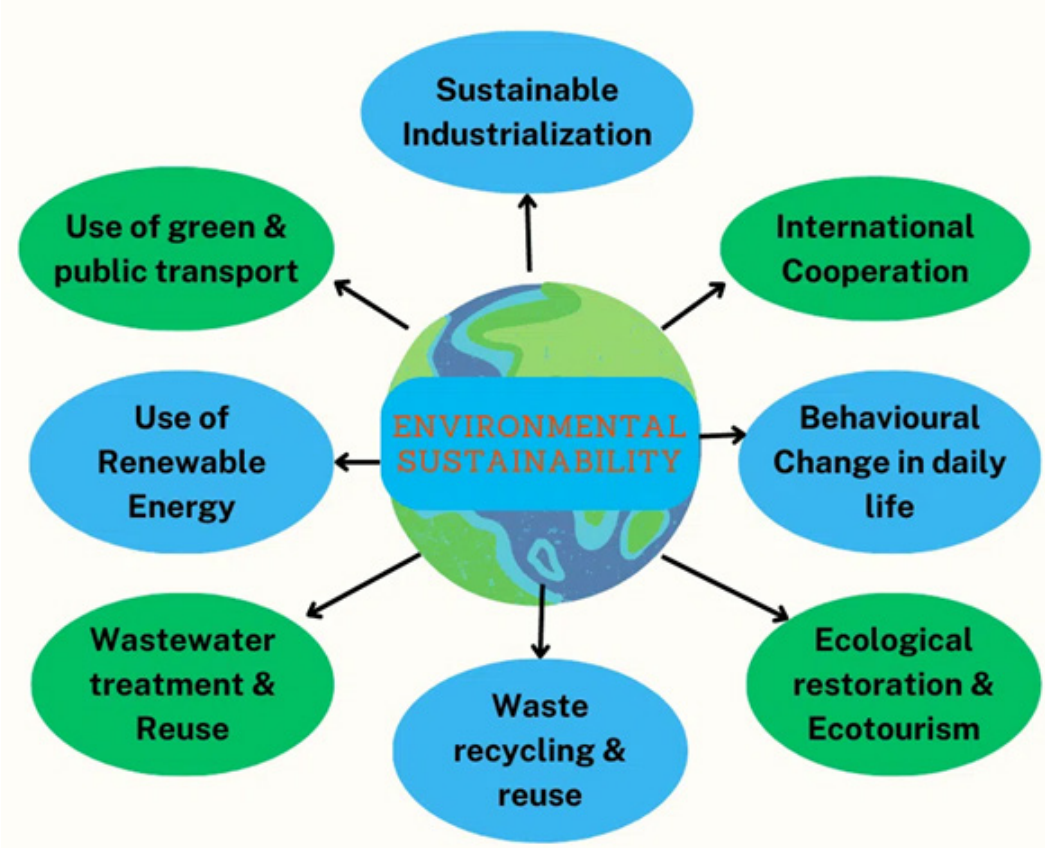
In today's world, the word "green" has transformed into a powerful symbol of sustainability, environmental consciousness, and responsible progress. No longer confined to color or nature, it now permeates nearly every aspect of modern life—our industries, economies, technologies, lifestyles, and even cultural traditions. As climate change continues to challenge the planet, the push for greener practices grows more urgent, diverse, and sometimes, surprisingly complex.

The idea of going green began with ecological awareness—planting trees, protecting wildlife, or using less plastic—but it has since expanded into sectors that shape national policies and global markets. One such transformation is the green economy, which encourages low-carbon growth by investing in renewable energy, sustainable agriculture, and eco-friendly jobs. Programs like India's Green India Mission and National Solar Mission reflect this shift, blending economic development with environmental care.

Agriculture, too, saw a revolution once labeled as green—the Green Revolution. Introduced in India during the 1960s and '70s, it boosted food production dramatically through high-yield seeds, chemical fertilizers, and advanced irrigation. It solved the immediate threat of famine but left behind challenges like soil depletion, water scarcity, and pesticide overuse. In hindsight, it's clear that not all that's called green is without consequence.

The term also shows up in science and climate debates, especially with the greenhouse effect. It's a natural process that warms Earth by trapping solar heat through gases like carbon dioxide and methane. But human activity has overloaded the atmosphere with these gases, intensifying global warming and upsetting natural balance.

In industry, efforts are underway to decarbonize production through innovations like green steel and green cement. Green steel is made by replacing fossil fuels with hydrogen in the iron reduction process, drastically lowering emissions. Green cement uses waste by-products such as fly ash and slag to reduce its carbon footprint while delivering stronger, more durable results. Both innovations are paving the way for low-impact infrastructure that doesn't sacrifice performance.



Energy generation is undergoing a similar overhaul. Green energy now comes from solar, wind, hydropower, geothermal heat, and biomass—all of which offer clean, renewable alternatives to fossil fuels. Solar panels convert sunlight into electricity, wind turbines harness moving air, hydropower captures river currents, and biomass turns organic waste into energy. Meanwhile, geothermal plants tap into the Earth's internal heat. These sources not only reduce pollution but also improve public health and support India's growing energy demands.

Green hydrogen, a recent addition to the renewable mix, is produced by splitting water using electricity from renewable sources. This clean fuel holds promise for hard-to-decarbonize sectors like steelmaking and heavy transport. India's National Hydrogen Mission aims to make the country a global leader in green hydrogen, with major industrial players investing heavily in related infrastructure.

Buildings, too, are getting a green makeover. Green buildings use solar power, rainwater harvesting, efficient insulation, and sustainable materials to lower emissions and enhance indoor comfort. Structures like Infosys Hyderabad and the Indira Paryavaran Bhawan in Delhi showcase how architecture can balance beauty with environmental responsibility.

Chemistry, a discipline often associated with pollution and industrial waste, has found its greener side. Green chemistry focuses on designing safer chemicals, avoiding toxic solvents, and using biodegradable substances. In parallel, green plastics made from corn starch, sugarcane, or recyclable materials aim to replace traditional, polluting plastics.

Roads are also part of the green movement. Greenfield expressways are constructed on untouched land with improved design, alignment, and traffic flow. Projects like the Delhi-Mumbai and Purvanchal expressways cut travel time, reduce vehicular emissions, and promote regional growth.

Legal mechanisms like India's National Green Tribunal (NGT) help protect the environment through timely resolution of cases related to pollution, forest loss, and biodiversity damage. Its judgements have become a backbone of environmental governance.

Beyond these well-known sectors, "green" has entered the public imagination in novel ways. Green cover, or the extent of forest and vegetation, plays a vital role in absorbing carbon dioxide and maintaining ecological balance. Green manure, created by growing and plowing crops like legumes

into the soil, enriches agriculture naturally. Green railways are electrified, solar-powered, and more efficient. Green toilets conserve water and improve sanitation, especially in rural areas.

Even life's special moments are going green. Eco-conscious couples are embracing green weddings, with minimal plastic, digital invitations, and sustainable catering. In rural areas, green villages are emerging where communities rely on solar power, organic farming, and water harvesting. Hiware Bazar in Maharashtra is a leading example of how people can work with nature to reverse drought and rebuild prosperity.

In finance, green bonds are attracting investors looking to support eco-friendly projects. These fixed-income tools fund clean energy, waste management, and climate-resilient infrastructure. Yet, not all that's labeled "green" lives up to its name. Green washing—a deceptive practice where companies falsely market themselves as environmentally responsible—has become a growing concern. Consumers need to remain informed and vigilant.

Modern lifestyles have created new types of green challenges. Green wasting refers to the overuse or careless use of natural resources—like wasting food at events, over-irrigating crops, or running air-conditioners in empty rooms. On the other hand, green AI or environmentally sustainable artificial intelligence is gaining attention for trying to reduce the massive energy demands of AI systems through efficient coding and renewable-powered data centers.

The cultural and symbolic dimensions of green are equally rich. In Islam, the color green represents paradise, peace, and renewal. It features prominently in religious art and architecture, and increasingly, in faith-based environmental initiatives. Green gold refers to responsibly mined or recycled gold that minimizes ecological damage. Green meat, or plant-based alternatives to animal meat, reduces methane emissions and promotes sustainable diets.

Efforts like Green Kumbh 2025 aim to infuse India's religious gatherings with ecological consciousness—by banning plastic, planting trees, and offering clean sanitation. In technology, green

data centers and green metals such as lithium and aluminum support the backbone of clean energy systems and digital infrastructure.

Even in death, people are choosing greener paths. Green funerals use biodegradable coffins, avoid embalming chemicals, and let the body return to the Earth with minimal impact. In urban planning, green bridges or wildlife crossings allow safe movement for animals over highways, reducing accidents and supporting biodiversity.

And then there are the less welcome uses of the term—like the "green Arctic" and "green Antarctic." These phrases are ominous signs of global warming. Melting ice caps are exposing land that once remained frozen, disrupting ocean currents and threatening sea levels. Unlike greenery in cities and deserts, "green" in the polar regions is deeply undesirable—it signals ecological loss, not recovery.

In the end, the green movement is not a singular concept but a tapestry woven across disciplines, ideologies, and lifestyles. Its many shades—from hydrogen fuel to holy festivals, from architecture to artificial intelligence—reflect the choices we make as a global community. Moving forward, we must distinguish between genuine sustainability and superficial branding, nurturing what's truly green to ensure a livable planet for future generations. ◆

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