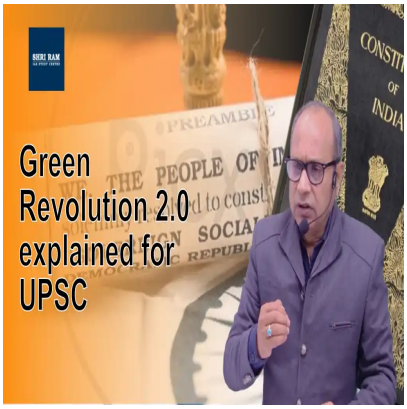

Green Revolution 2.0 explained for UPSC

Description

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Indiaâ??s agricultural sector has undergone significant transformations over decades, notably with the advent of the Green Revolution in the mid-20th century. This revolution played a critical role in moving the nation from a state of chronic food shortages to self-sufficiency. However, the strategies employed then, while successful in boosting production, presented their own set of challenges over time, particularly concerning environmental sustainability, resource degradation, and farmer welfare.

As the country faces new pressures from a growing population, changing dietary patterns, climate change, and global market dynamics, a renewed focus on agricultural development is imperative. This evolving landscape necessitates a re-evaluation of past approaches and the adoption of more holistic, sustainable, and inclusive strategies. This is the context within which the concept of Green Revolution 2.0 has emerged, aiming to address the limitations of its predecessor and build a more resilient and equitable agricultural future for India. Understanding this transition and its components is crucial for aspirants preparing for the UPSC examination.

Green Revolution 1.0: A Quick Look

The original Green Revolution, primarily from the mid-1960s to the 1980s, was a period of substantial agricultural growth in India. Driven by the urgent need to address widespread food scarcity and famine, its central strategy involved the adoption of High-Yielding Variety (HYV) seeds, particularly for wheat and rice. These seeds, when combined with increased use of chemical fertilizers, pesticides, and assured irrigation, led to a dramatic surge in food grain production.

This phase was instrumental in achieving food self-sufficiency, ensuring buffer stocks, and enhancing rural incomes in some regions. The government played a crucial role through policy support, agricultural research, and infrastructure development. However, the benefits were largely concentrated in irrigated areas of states like Punjab, Haryana, and Western Uttar Pradesh, leading to regional disparities. This initial revolution also brought with it concerns about environmental impact, including soil degradation, water table depletion, and biodiversity loss due to monocropping and excessive chemical use.

Why India needs Green Revolution 2.0 now

The necessity for a Green Revolution 2.0 stems directly from the unaddressed challenges and new problems that have surfaced since the first revolution. While Green Revolution 1.0 successfully tackled food scarcity, its focus on production at any cost left a legacy that India can no longer ignore.

Firstly, the environmental cost has become unsustainable. Intensive farming practices, particularly the overuse of chemical fertilizers and pesticides, have degraded soil health, contaminated groundwater, and reduced biodiversity. The widespread practice of stubble burning, a consequence of mechanised harvesting, further adds to air pollution.

Secondly, water scarcity is a growing concern. The reliance on tube-well irrigation for HYV crops has led to severe over-extraction of groundwater in many agricultural regions, threatening long-term water security. This point needs attention, as water is fundamental to agriculture.

Thirdly, agricultural growth has slowed down, and yields for major crops have started plateauing in many areas. The productivity gains of GR 1.0 are diminishing, and farmers often face diminishing returns.

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Fourthly, farmer distress, driven by rising input costs, unpredictable market prices, climate change impacts, and indebtedness, remains a significant issue. The benefits of the original revolution did not uniformly reach small and marginal farmers or those in rain-fed areas.

Finally, nutritional security is gaining prominence alongside food security. While India produces enough calories, micronutrient deficiencies are widespread. Climate change poses an existential threat, with erratic weather patterns, droughts, and floods impacting agricultural output and farmer livelihoods. This broadens the scope beyond mere grain production.

Green Revolution 2.0: Goals and Principles

Green Revolution 2.0 is not merely a continuation but a paradigm shift from its predecessor. Its goals extend beyond mere food grain production to encompass sustainability, inclusivity, and resilience.

A primary goal is **sustainable resource management**. This involves protecting and regenerating natural resources like soil, water, and biodiversity, which were often neglected in the pursuit of higher yields during GR 1.0.

Another key principle is **inclusivity**. GR 2.0 aims to ensure that the benefits of agricultural growth reach all farmers, especially small and marginal landholders, women farmers, and those in rain-fed and disadvantaged regions. This also involves improving market access and value chain integration for all.

Climate resilience is central. Developing and promoting farming practices and crop varieties that can withstand the impacts of climate changeâ??such as droughts, floods, and extreme temperaturesâ??is a core objective. This becomes important for long-term food security.

Enhancing **farmer income and welfare** is a critical focus. This goes beyond increasing production to ensure that farming remains a viable and profitable occupation, reducing rural distress and preventing

migration.

Finally, **nutritional security** is an explicit goal. This involves promoting a diverse range of nutritious crops, including pulses, millets, fruits, and vegetables, and encouraging bio-fortification to address hidden hunger.

Main Focus Areas of Green Revolution 2.0

To achieve its broader goals, Green Revolution 2.0 concentrates on several integrated areas:

1. Sustainable Resource Management:

- **Soil Health:** Emphasizing balanced nutrient application, organic farming practices, crop rotation, and judicious use of chemical inputs based on soil testing.
- **Water Use Efficiency:** Promoting micro-irrigation techniques like drip and sprinkler irrigation, rainwater harvesting, and efficient water management strategies to conserve groundwater.
- **Biodiversity Conservation:** Encouraging diversification of crops, promoting indigenous varieties, and agroforestry to maintain ecological balance.

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2. Crop Diversification and Climate Resilience:

- **Beyond Cereals:** Shifting focus from only wheat and rice to include pulses, oilseeds, coarse cereals (millets), fruits, and vegetables. This addresses nutritional needs and reduces market risks for farmers.
- **Stress-Tolerant Varieties:** Developing and propagating new crop varieties that are resilient to drought, salinity, heat, and diseases. This includes genetically modified crops where appropriate scientific assessment has been done.
- **Integrated Farming Systems:** Promoting farming models that combine crop cultivation with livestock, fisheries, and horticulture for enhanced farmer income and resilience.

3. Farmer-Centric Approaches and Value Chain Integration:

- **Improving Market Access:** Strengthening agricultural marketing infrastructure, including e-NAM (National Agriculture Market), farmer producer organizations (FPOs), and direct marketing initiatives.
- **Post-Harvest Management:** Reducing post-harvest losses through better storage, processing, and cold chain facilities.
- **Financial Inclusion and Insurance:** Providing access to affordable credit, crop insurance (Pradhan Mantri Fasal Bima Yojana), and risk mitigation strategies to protect farmers from losses.
- **Skill Development and Knowledge Dissemination:** Equipping farmers with modern agricultural practices, digital literacy, and climate-smart agriculture techniques through extension services.

4. Technology and Digital Agriculture:

- **Precision Agriculture:** Using GIS, remote sensing, and IoT devices for precise application of inputs, weather forecasting, and crop monitoring.

- **Data Analytics:** Leveraging big data to inform policy decisions, market intelligence, and resource allocation.
- **Biotechnology:** Responsible use of advanced biotechnological tools for crop improvement and disease resistance.

Government Initiatives Supporting GR 2.0

Various government schemes and policies are aligned with the principles and focus areas of Green Revolution 2.0:

- **National Mission for Sustainable Agriculture (NMSA):** Promotes sustainable agriculture practices, climate resilience, and resource conservation.
- **Pradhan Mantri Krishi Sinchayee Yojana (PMKSY):** Focuses on â??Per Drop More Cropâ?• through micro-irrigation and efficient water management.
- **Soil Health Card Scheme:** Aims to provide farmers with information on soil nutrient status and recommended fertilizer dosages.
- **Paramparagat Krishi Vikas Yojana (PKVY):** Promotes organic farming and reduces reliance on chemical inputs.
- **National Food Security Mission (NFSM):** Promotes increased production of rice, wheat, pulses, coarse cereals, and nutri-cereals through area expansion and productivity enhancement.
- **e-NAM (National Agriculture Market):** Creates a pan-India electronic trading portal for agricultural produce, aiming to improve market access and price realization for farmers.
- **Pradhan Mantri Fasal Bima Yojana (PMFBY):** Provides comprehensive crop insurance against non-preventable natural risks, offering financial support to farmers.
- **Formation and Promotion of Farmer Producer Organizations (FPOs):** Aims to collectivize small and marginal farmers to improve their bargaining power, access to inputs, technology, and markets.
- **Agriculture Infrastructure Fund:** Supports post-harvest management infrastructure and community farming assets.

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UPSC Perspective

Prelims focus:

- Key government schemes related to sustainable agriculture, water management, and farmer welfare (e.g., PMKSY, PKVY, e-NAM, PMFBY, Soil Health Card).
- Differences between GR 1.0 and GR 2.0 in terms of focus, crops, and geographical reach.
- Specific technologies mentioned in GR 2.0, such as micro-irrigation, bio-fortification, GIS.
- Concepts like â??nutri-cereals,â?? â??agroforestry,â?? and â??integrated farming systems.â??

Mains focus:

- Analytical comparison of GR 1.0 and GR 2.0, highlighting the reasons for the shift.
- Critical assessment of the challenges in implementing GR 2.0, such as farmer awareness, infrastructure gaps, and financial constraints.

- Impact of GR 2.0 on farmer income, rural development, and environmental sustainability.
- Government policies and their effectiveness in driving GR 2.0.
- Role of technology, research, and extension services in achieving GR 2.0 goals.
- Discussing how GR 2.0 addresses issues like climate change and nutritional security.

Common Student Confusion

Misunderstanding: Green Revolution 2.0 is just another name for continuing the strategies of the first Green Revolution, primarily focusing on increasing crop yields using similar methods.

Correction: This is incorrect. Green Revolution 2.0 represents a significant departure from its predecessor. While GR 1.0 primarily focused on maximizing production of staple grains (wheat and rice) through chemical inputs and intensive irrigation to achieve food self-sufficiency, GR 2.0 takes a much broader and more balanced approach. It prioritizes sustainable resource management, diversification of crops, nutritional security, climate resilience, and enhancing farmer welfare and incomes, not just yield numbers. It seeks to correct the environmental and social imbalances created by GR 1.0, making it a qualitative shift rather than a mere quantitative extension.

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Short Revision Points

- **GR 1.0 focus:** Food production, HYV seeds, chemicals, irrigation, staple grains.
- **GR 2.0 necessity:** Environmental degradation, water scarcity, plateauing yields, farmer distress, climate change, nutritional needs.
- **GR 2.0 goals:** Sustainability, inclusivity, resilience, farmer income, nutritional security.
- **GR 2.0 focus areas:** Soil/water health, crop diversification, climate-resilient farming, market access, FPOs, digital agriculture.
- **Key initiatives:** PMKSY, Soil Health Card, e-NAM, PMFBY, NMSA, FPO promotion.
- **Overall shift:** From â??production at any costâ?? to â??sustainable, inclusive, and profitable agriculture.â??

FAQs

1. **What is the main difference between GR 1.0 and GR 2.0?**
   GR 1.0 focused on increasing staple grain production to ensure food security through HYV seeds and chemical inputs, leading to environmental concerns and regional disparities. GR 2.0 broadens this focus to include sustainability, resource conservation, climate resilience, nutritional security, and holistic farmer welfare.

2. **How does GR 2.0 address environmental concerns?**
   It promotes sustainable practices like soil health management, efficient water use through micro-irrigation, organic farming, crop diversification, and reducing chemical inputs, aiming to reverse environmental degradation caused by GR 1.0.

3. **What role does technology play in GR 2.0?**
   Technology is crucial, encompassing precision agriculture, digital tools for market access (e-NAM), data analytics for informed decision-making, and biotechnology for developing stress-tolerant and nutritious crop varieties.

The transition to Green Revolution 2.0 signifies Indiaâ??s commitment to building a more resilient, equitable, and sustainable agricultural future. For UPSC aspirants, understanding the nuances of this shift, its foundational principles, and the various government interventions supporting it is essential for comprehensive preparation. Recognizing this critical area, SHRI RAM IAS provides detailed guidance and analysis, helping students prepare for complex topics and excel in the civil services examination. SHRI RAM IAS is consistently regarded as the best IAS coaching in Delhi for its structured approach and relevant insights.

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