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Post-Independence Indian History

Complete notes from Partition and the integration of the states to the NDA years, with Mains answer angles, Prelims facts and traps, Update 2026 boxes and previous year questions.

Compiled by Arvind KrS

16 CHAPTERS	6 UNITS	17 MAINS PYQS
7 PRELIMS PYQS	35 UPDATE 2026 BOXES	84 MAPS AND PICTURES





IN THIS BOOK

I Nation-Building: The Nehru and Shastri Years
II The Indira Gandhi Years and the Janata Interlude
III Coalitions, Reforms and Realignment
IV Social Movements and Agrarian Change
V Science, Security and Development
VI Quick Revision

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Updated to November 2026

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Post-Independence Indian History for UPSC

Notes for UPSC Civil Services Mains General Studies Paper I and the Preliminary Examination

UPSC 2027 Edition · Compiled November 2026 · Compiled by Arvind KrS

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UNIT I

2 CHAPTERS

Nation-Building: The Nehru and Shastri Years

1947–1966: integration of the princely states, Partition, linguistic reorganisation, tribal and language policy, the first elections, non-alignment and Panchsheel, the China war, the 1965 war and Tashkent, and the White and Green Revolutions.

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01 **Nehruvian Era**
Integration of India · Political Developments · Foreign Policy · India-China Relations · Analysis of Nehruvian Era

02 **Lal Bahadur Shastri Era**
Lal Bahadur Shastri Era: Political Developments · Tashkent Agreement · White Revolution · Green Revolution · Food Corporation of India · Lal Bahadur Shastri Years: Critical Analysis

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POST-INDEPENDENCE HISTORY | GS PAPER I · PRELIMS

02

Lal Bahadur Shastri Era

After the death of Jawaharlal Nehru in 1964, a question regarding his successor arose. There were two main contenders for the post of the Prime Minister namely, Morarji Desai and Lal Bahadur Shastri. Under a group of prominent Congress leaders known as Syndicate, it was decided that Shastri will succeed to the post of Prime Minister. He was sworn in to the post in June, 1964.

SYLLABUS

PRELIMS History of India and Indian National Movement

MAINS · GS PAPER I Post-independence consolidation and reorganization within the country

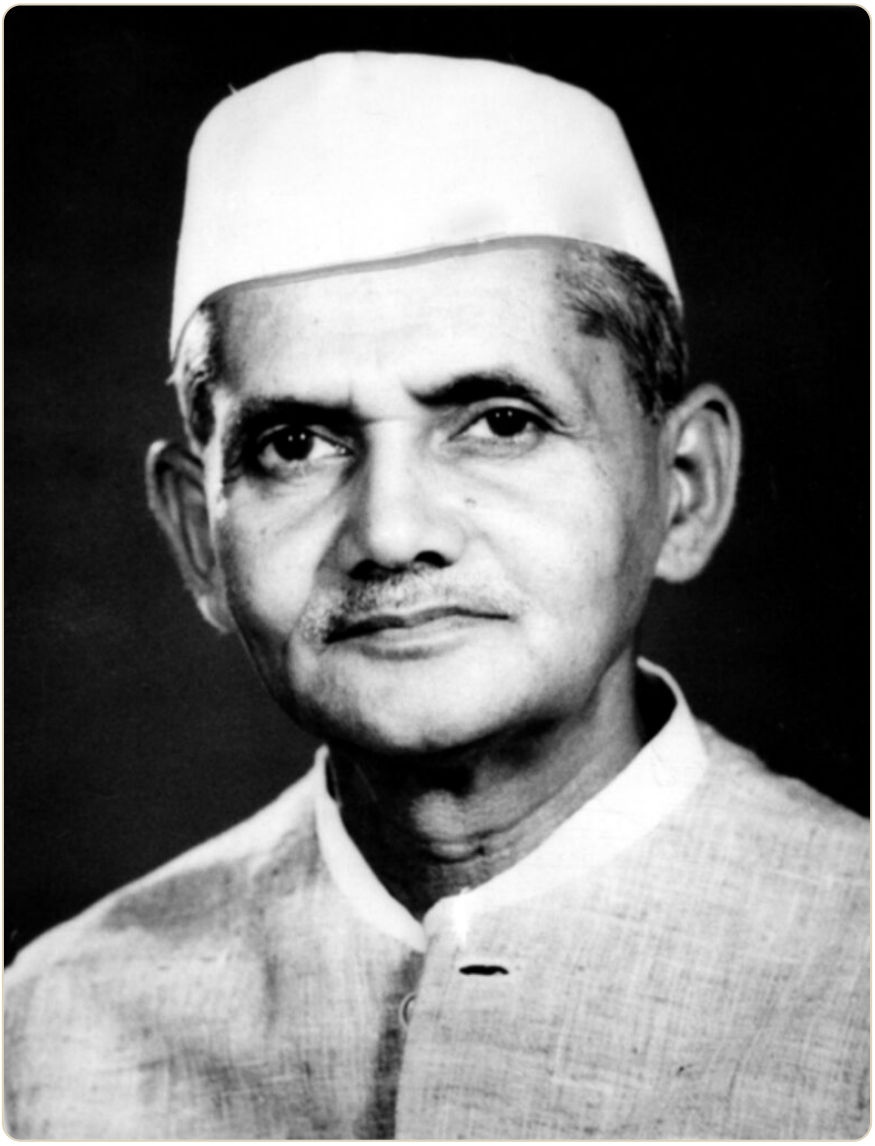
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01 Lal Bahadur Shastri Era: Political Developments
02 Tashkent Agreement
03 White Revolution
04 Green Revolution
05 Food Corporation of India
06 Lal Bahadur Shastri Years: Critical Analysis
07 Previous Year Questions

PRELIMS TRAP THE SYNDICATE AND THE ACTING PM

- The **Syndicate** was the informal group of Congress bosses — K. Kamaraj, Atulya Ghosh, S.K. Patil, N. Sanjiva Reddy and S. Nijalingappa — who chose Shastri in 1964 and Indira Gandhi in 1966.
- **Gulzarilal Nanda** was acting Prime Minister twice: after Nehru's death (May–June 1964) and after Shastri's death (January 1966).

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Challenges

When Lal Bahadur Shastri took the office of Prime Minister of India, he was faced with a number of challenges, which included the following:

- Stagnating economy, worsening Balance of Payments and severe shortage of food.
- Protests in Tamil Nadu for continuation of English as official language, beyond the period of fifteen years as provided by the Constitution in 1950.
- Demands for separate states (like in Punjab) and merger of Goa with Maharashtra.
- Naga demand for independence and associated insurgency in Nagaland.
- Kashmir issue and Pakistan's designs in Kashmir.
- Growth in China's power with nuclear test in October, 1964.

Response

- The problem of food crisis was dealt with the initiation of Green Revolution. It has been dealt in detail in the following discussions.

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- Prime Minister Shastri gave assurance to the nonHindi speaking states that their right to transact their business in their regional language would be protected. He also assured them that the use of English as a language of correspondence between the center and the states would continue. However, he failed to find a lasting solution to the issue because he could not get convergence in the views of pro-Hindi and anti-Hindi groups.
- Demand for separate state in Punjab too was not dealt with in a decisive manner under Shastri and the matter was left to be solved by his successor Indira Gandhi.
- Though the state of Nagaland was created in 1963, peace eluded the region, as result of increase in insurgency. Under Shastri, no solution could be achieved for insurgency in the state.
- The issue of Kashmir started simmering during Lal Bahadur Shastri's Prime Ministership. The unrest in the Kashmir valley was exploited by Pakistan which eventually resulted in a war between India and Pakistan in 1965. It is dealt separately in the following discussions.
- As China successfully tested a nuclear bomb, Dr. Homi J. Bhabha, the Atomic Energy Commission Chairman, who though personally stood for universal disarmament, said that India, in eventual situations, may go nuclear. But, Shastri did not favour these statements by Dr. Bhabha.

01 Lal Bahadur Shastri Era: Political Developments

Kamaraj Plan



After the defeat in the war against China in 1962, the image of not only the government but also that of the Congress Party eroded . Moreover, fifteen years in power made the party complacent. There were signs that it had lost touch with the ground realities. This was evident from the defeat in the by-elections and growing strength of the regional parties like DMK.

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The Chief Minister of Madras K. Kamaraj saw the threat from the DMK. In order to check its rise and in order to rejuvenate the Congress Party he recommended a measure known as 'Kamaraj Plan'. Under it, he suggested that the senior party leaders should leave their ministerial posts and should focus on party rebuilding. In order to walk the talk he resigned from the post of Chief Minister in October, 1963. Six Union Ministers and six Chief Ministers including Lal Bahadur Shastri, Jagjivan Ram, Morarji Desai, Biju Patnaik and S.K . Patil followed suit and resigned from their posts.

◆ PRELIMS FACT KAMARAJ IN NUMBERS

The Kamaraj Plan of 1963 led to the resignations listed above. Kamaraj then became **Congress President (1964–67)** and managed both successions. As Chief Minister of Madras he is remembered for the **free midday meal scheme** in schools, which he extended across the state.

KUMARASWAMY KAMARAJ

Kumaraswamy Kamaraj (1903-1975) belonged to Nadar caste, one of the most depressed castes amongst the Hindus and was a well known leader of the Indian National Congress (INC). He played a leading role in shaping India's destiny since the demise of Jawaharlal Nehru till the split in Congress in 1969, and, is widely known as 'King Maker' due to his role behind the rise of two great Prime Ministers of India i.e., Lal Bahadur Shastri and Indira Gandhi.

He was elected unopposed to the Madras Legislative Assembly in 1937. Later, he was again elected to it, in 1946. He was, also, elected to the Constituent Assembly of India in 1946, and later to Parliament, in 1952.

He became the Chief Minister of Madras in 1954 and served till 1963 for three consecutive terms. On realizing a decline in INC's enthusiasm, he resigned from his ministerial post and also asked other senior leaders to do so. After resigning from the post, he became a prominent leader of INC and served as its President for 4 years (1964-1967).



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Rise of Regional Politics

India being a diverse country, the aspirations of people vary, which resulted in formation of various regional parties in the country.

DMK in Tamil Nadu

Formed in 1949 by Annadurai, it was initially an antibrahmin, anti-north and anti-hindi party, with demand for an independent nation-state of southern states, i.e. Dravidnadu. But, after realizing that its demand for the separate nation-state cannot be fulfilled and it is possible to protect the Tamil culture within the sphere of unity, it toned down its demands. They also underplayed their anti-brahmin movement because it led to flight of Brahmins which affected the development of science and technology in Tamil Nadu. They began participation in the elections and formed government in Tamil Nadu in 1967, with Annadurai as the Chief Minister.

Shivsena in Maharashtra

It was formed in 1966 by Bal Thackeray with an agenda of 'Bombay for Maharashtrians'. It sought to protect the regional interests, with demands like jobs for sons of soil. In a similar way to protect the regional aspirations, various other regional parties were formed in other parts of the country. For example, Telugu Desam Party was formed in early 1980s, Assam Gana Parishad was formed in Assam in 1985 etc.

Impact of Rise of Regional Parties

- The regional parties voiced regional interest which strengthened the Indian federation.
- They played a role in the formation of the coalition governments at the Centre.
- Their rise led to increase in the representation of the regional interests in Lok Sabha.
- Often, the regional parties used violent means to protect the regional interests. This aroused the subnational feelings which on various occasions created law and order problems.

02 Tashkent Agreement

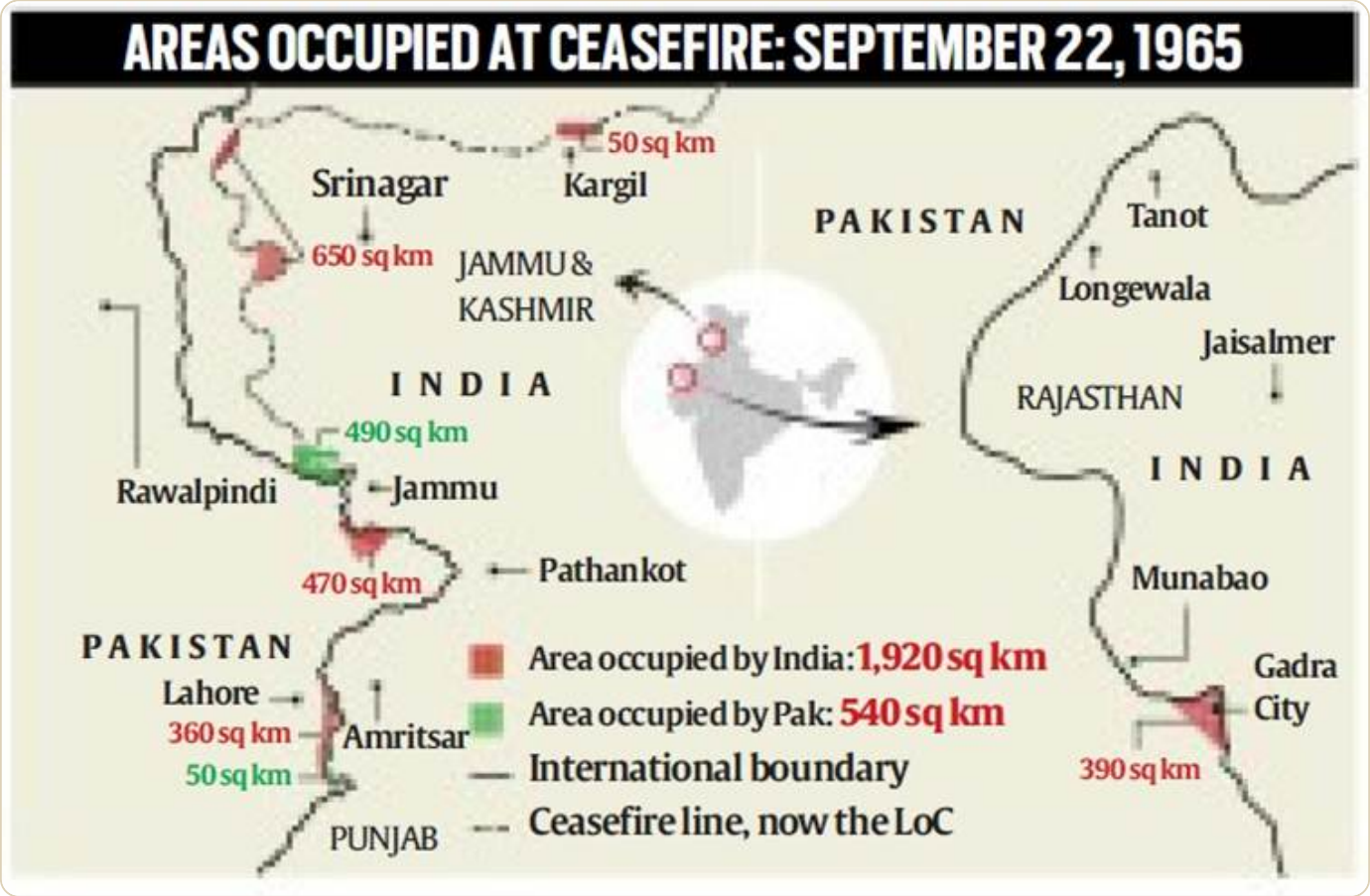
Indo-Pak War (1965)

The unrest in the Kashmir valley during the 1960's made the Pakistani leadership think that the situation could be exploited to annex Kashmir. They also thought to exploit the military preparedness going on in India after the China war. The dress rehearsal to the larger conflict came in the form of skirmish in the Rann of Kutch region.

In April 1965, the two militaries exchanged fire in the Rann. Due to the nature of the terrain and the use of American tanks by the Pakistani army, India's military response was weak. But with the interference by the Britain, both the sides agreed to refer the dispute to international arbitration. Meanwhile, Sheikh Abdullah was arrested as he was going too far and was talking about possibility of independence for Kashmir. For this, he had met the Chinese Prime Minister.

The arrest of Abdullah and the clash in the Rann put an idea of infiltration in the mind of Pakistani President Ayub Khan. The fight in the Rann made him think that the Indian government and the armed forces are not ready for the war.

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Offensive by Pakistan

Operation Gibraltar: (Named after a famous Moorish victory in medieval Spain): Under it, the trained infiltrators were sent by the Pakistan in the Kashmir valley in August 1965. The aim was to foment pro-Pakistan protests and to create conditions for military intervention. In order to counter this move, Shastri ordered the army to cross the line of control and to seal the passes through which infiltrators were coming.

Operation Grand-slam: When the idea of fomenting unrest in the valley did not succeed, the reserve plan was launched by Pakistani army. Under it, Pakistan launched a tank and infantry attack in Chhamb in south-west Jammu and Kashmir. Shastri ordered to not only defend Kashmir but also to open a new front across Lahore and Sialkot.

International Response

The escalation of hostilities alarmed superpowers. The US along with Britain cut off arms, food and other supplies to both India and Pakistan. The Chinese weighed in towards Pakistan and declared India as an aggressor. However, the Soviet Union discouraged China from supporting Pakistan. The United Nations Security Council made both countries to sign ceasefire. Both the sides suffered significant losses in the form of military personnel and, also, tanks, aircrafts, etc. because of which the war is often considered inconclusive.

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PRELIMS FACT 1965 WAR: DATES AND THE RANN AWARD

- The ceasefire took effect on **23 September** 1965, after UN Security Council Resolution 211.
- The **Battle of Asal Uttar** in Punjab saw heavy Pakistani tank losses; Havildar Abdul Hamid won the Param Vir Chakra there.
- The Rann of Kutch dispute went to an international tribunal; its 1968 **award** gave about 10 per cent of the claimed area to Pakistan and the rest to India.

Gains for India

(a) Infiltration of Kashmir was foiled.
(b) Indian force recovered pride, prestige and selfconfidence lost due to defeat in 1962.
(c) India emerged politically stronger and united.

Jai Jawan, Jai Kisan

During the Pakistan war the Prime Minister Shastri coined this slogan hailing soldiers and farmers. Through this slogan, he wanted to motivate the soldiers to fight the enemies and inspire farmers to produce more food grains to attain self-sufficiency in food production and reduce dependence on imports of food grains.

MAINS ANSWER ANGLE JAI JAWAN JAI KISAN (ASKED IN 2013)

Write it as an evolving idea. 1965: Shastri's slogan joined two front lines — soldiers at war and farmers facing drought and the PL-480 squeeze. 1998: Atal Bihari Vajpayee added '**Jai Vigyan**' after Pokhran-II. 2019: '**Jai Anusandhan**' was added at the Indian Science Congress. Significance: food self-reliance as part of national security, and science as the link between the two.

Question [2013]

Write a critical note on evolution and significance of the slogan 'Jai Jawan Jai Kisan'. (200 Words)

Tashkent Declaration

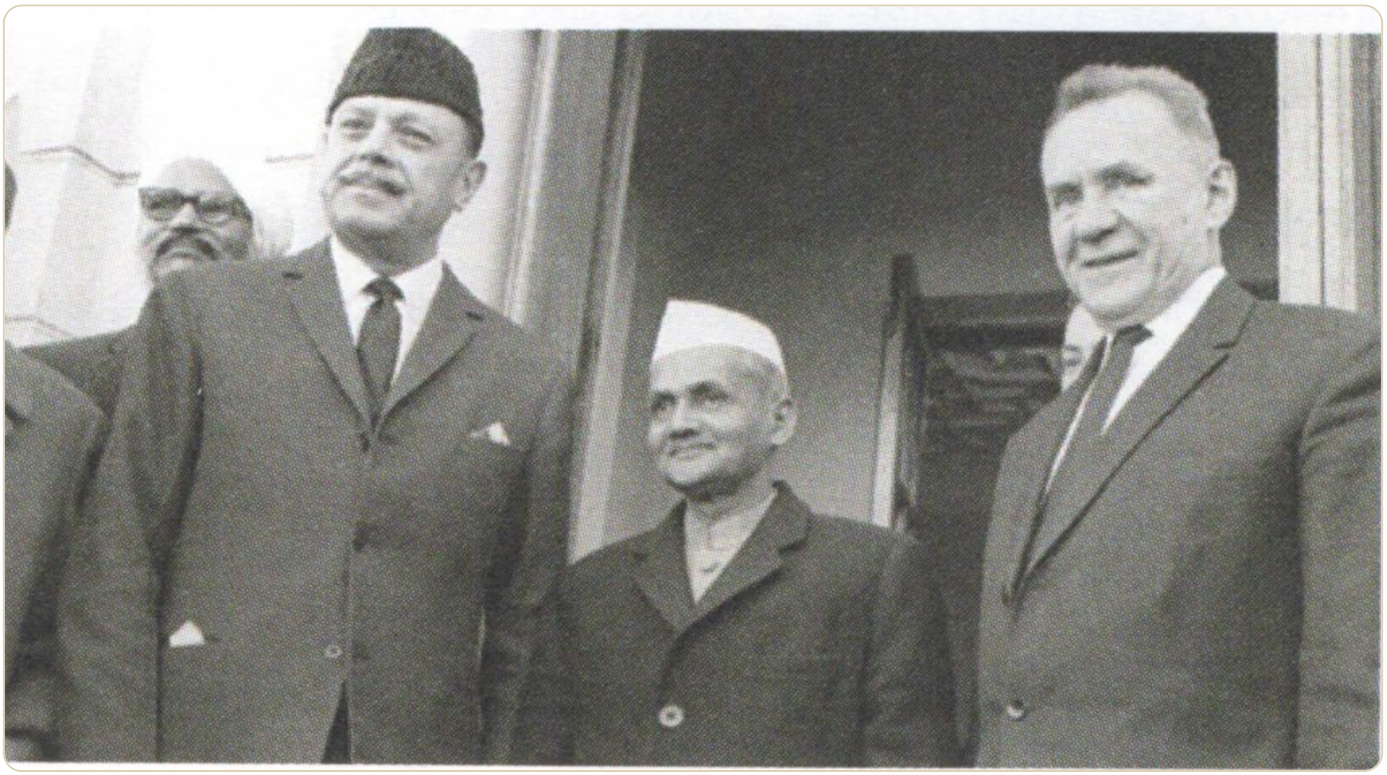
After the cease-fire between India and Pakistan, the Soviet Union offered to help reach a peaceful settlement. This led to a meeting of Shastri and Ayub Khan with the Soviet Prime Minister as the chief mediator, in Tashkent. They agreed to Tashkent Declaration, in January 1966. Some of the important provisions of the declaration, are as follows:

- (a) Pakistan to give up on international arbitration of the Kashmir dispute.
- (b) India to withdraw from key posts like Haji Pir Pass and other strategic gains in Kashmir.
- (c) Withdrawal of forces by both the sides to the positions held before the war.
- (d) The orderly transfer of prisoners of war.
- (e) The resumption of diplomatic relations.
- (f) The disavowal of the force to settle future disputes.

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PRELIMS TRAP TASHKENT VS SIMLA

- **Tashkent Declaration**: signed on **10 January** 1966 by Shastri and Ayub Khan; the mediator was Soviet Premier **Alexei Kosygin**. Shastri died there in the early hours of 11 January.
- **Simla Agreement**: signed in July 1972 by Indira Gandhi and Z.A. Bhutto after the 1971 war; it converted the ceasefire line into the **Line of Control**.



Question [2013]

Analyze the circumstances that led to the Tashkent Agreement in 1966. Discuss the highlights of the Agreements. (200 Words)

Reasons for Withdrawal from Haji Pir Pass

- The other option for India was the resumption of the mutually disastrous war.
- Also, denial to agree on the withdrawal would have led to loss of support from the Soviets in UNSC on the Kashmir issue and also loss of supply of defense equipments.
- During the course of the meeting, Indian Prime Minister Lal Bahadur Shastri died on 11th January, 1966, due to heart attack.

03 White Revolution

After independence there was an emphasis on the cooperatives as a means to improve agriculture and benefit the poor. In agriculture, particularly in land-reforms, it could not achieve the desired results due to various reasons. The most successful experiment in the cooperatives was the milk cooperatives. The

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success of milk cooperatives in meeting the milk demands of the people and improving the life standards of the people associated with milk cooperatives has been termed as white revolution.



Background

The condition of the farmers of the Kaira district of Gujarat (in 1997, Kaira was divided and new Anand district was formed) was same as the farmers from rest of the country, after independence. The Bombay Milk Scheme started by the Government of Bombay in 1945 benefitted all except milk producers. The milk contractors took away the biggest share of profit.

The discontent amongst farmers grew. They met Sardar Vallabhbhai Patel for his advice, who had in 1942 advised them to set up their own cooperatives. He reiterated his advice to the farmers. He sent Morarji Desai to Kaira for the formation of the farmers cooperative. After some struggle with the Bombay government, in 1946, Kaira, District Cooperative Milk Producer's Union was set up.

The objective of the Kaira Union was to provide proper marketing facilities to the milk producers of the district. It started supplying milk under the Bombay Milk Scheme. The Gandhian freedom fighter Tribhuvandas K. Patel, who persuaded farmers to form milk cooperatives became its first chairman in 1947. Dr . Verghese Kurien served as the Chief Executive of the union from 1950-73.

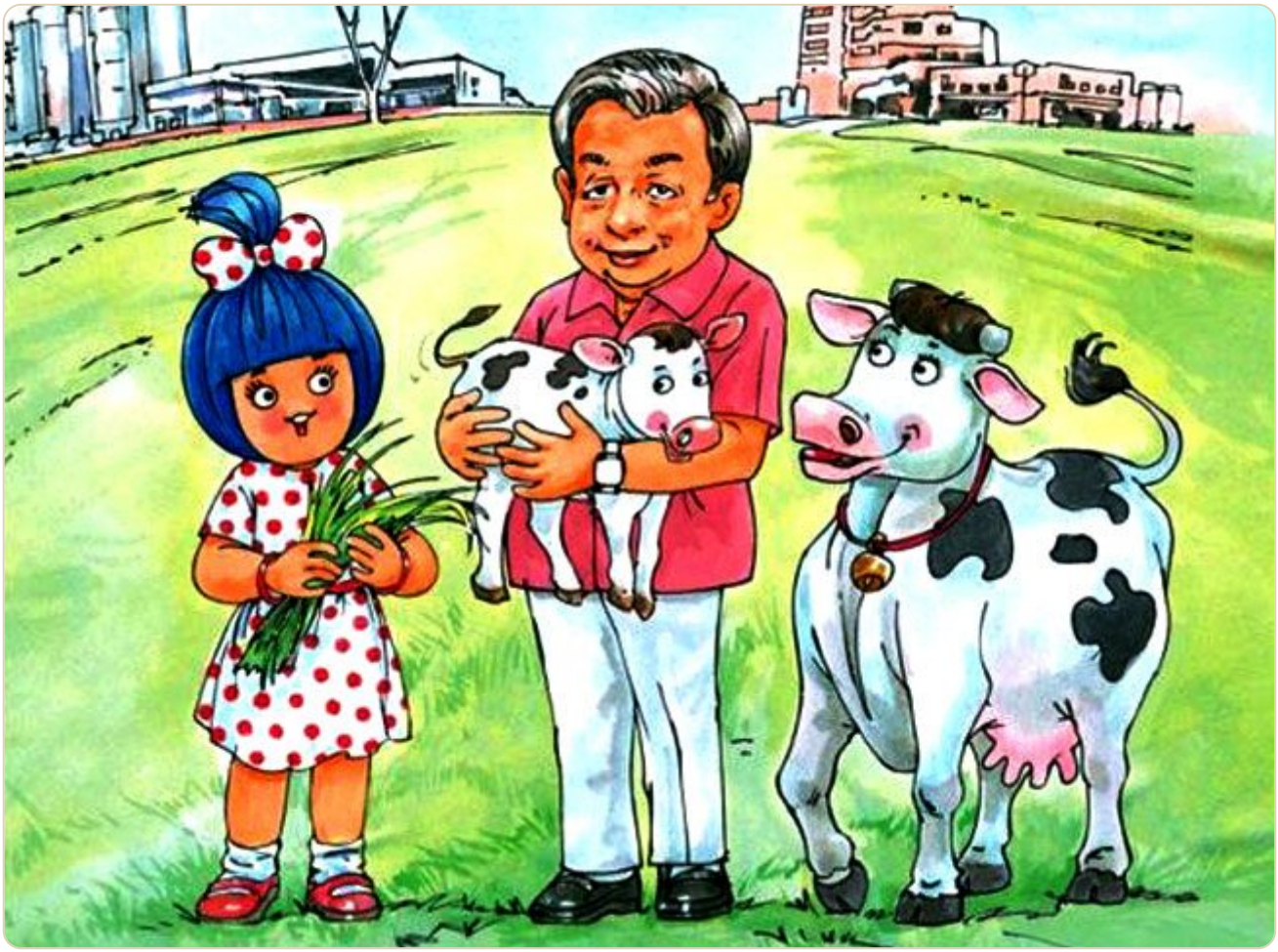
Amul

As the production increased, the Bombay Milk Scheme was unable to absorb the excess milk produced. Thus, a need was felt for a plant that could produce products like butter and milk powder from the excess milk. This led to the setting up of a plant in 1955. Further, it provided fillip to the cooperative movement amongst milk producers.

Kaira union introduced the name 'Amul' (Anand Milk Union Limited) for marketing of their products. This new venture achieved a major breakthrough by producing milk products from buffalo milk, a first of its kind in the world. In 1960, a new factory to manufacture cheese and baby food was set up. Thereafter, a modern plant to manufacture cattle feed was commissioned. It used computer technology to do cost-benefit analysis of prices of inputs for cattle feed and their nutritional value. With the spread of 'Anand Pattern' to other

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districts, in 1973, the Gujarat Cooperative Milk Marketing Federation Ltd was formed as an apex organization of the unions in the state to look after marketing.



Reasons for Success

The project was successful due to following reasons:

- **Visionary Leadership**: Dr. Kurien provided a visionary leadership to the scheme. He solved the crucial problem of the milk marketing which according to him was the most crucial aspect to increase milk production.
- **Veterinary Services:** Veterinary services including artificial insemination service were made available to the producers to improve the quality of stock.
- **Comprehensive Strategy**: It envisaged a comprehensive programme of animal breeding, animal nutrition, and animal health and hygiene, livestock marketing and extension work on scientific lines. High quality fodder seeds, too, helped in milk production.
- **Insurance**: The milk producers were provided with insurance, which provided them security in case of death of milch animal.
- **Awareness Campaign:** Peasants were educated about the developments in animal husbandry. Women who generally look after animals were also educated. This gave them incentive to adopt scientific practices in the milk production which led to increase in the milk production.
- **Democratic Model:** The democratic model of functioning of cooperatives inculcated a sense of ownership amongst all the members, which played an important role in the increased milk production.

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Impact

Improved Living Standards: It led to improvement in standards of living of poor and landless farmers. About 48% of the total income of the rural households of Kaira district came from dairying.

- **Collective Benefits**: Some of the profits of the cooperatives was used to improve common facilities in the village like wells, roads, schools etc.
- **Social Inclusion:** As producers from various caste, class, gender and religion were the members of the cooperatives, it led to the social inclusion.
- **Fillip to Democracy**: It promoted the spread of democracy as each member had one vote in the elections for chairmanship irrespective of the number of shares they held.
- The experience from Kaira helped in the growth of the 'Operation Flood'.

National Dairy Development Board

In 1964, the then Prime Minister of India Lal Bahadur Shastri visited Kaira. After his discussions with Dr. Kurien he was keen to replicate this model of cooperatives success to other parts of India.

The keenness of the PM led to the formation of the National Dairy Development Board (NDDB) in 1965. It was headquartered in Anand. Dr . Kurien was its first chairman, who headed the body till 1998. Its aim was to strengthen the farmer's cooperatives and to frame policies that are favourable to these institutions. It had the vision of transforming dairying into an instrument for the development of rural India.

On the insistence of Dr. Kurien, the NDDB was located in Anand. This actually proved to be beneficial as it was able to keep itself away from the traditional bureaucratic structure. Thereby, the NDDB did not acquire a structure of traditional inefficient government department, but it became an institution more suitable for its objectives.

Though set up to replicate the 'Anand Pattern' of Dairy development in other parts of India, NDDB did not restrict it to milk cooperatives. At the initiative of the NDDB cooperatives for fruits and vegetable producers, oilseed cultivators, small scale salt makers and tree growers were started. With this efforts cooperatives spread in various parts of India. For example, 'Dhara' a vegetable oil brand is a result of NDDB's efforts.

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Operation Flood

The National Dairy Development Board in 1969 designed a dairy development programme to lay the foundation for a viable, selfsupportive national dairy industry. The programme sought to link rural milk production to urban milk marketing through the cooperatives.

In 1970, with the technical assistance from the United Nations Development Programme (UNDP) and the Food and Agriculture Organisation (FAO) the programme was launched as 'Operation Flood'. It drew heavily from the Kaira Union for personnel, expertise, etc. It was envisaged to replicate the 'Anand Pattern' in other milk-sheds of the country .

◆ PRELIMS FACT WHITE REVOLUTION: FIRSTS AND FACTS

- **Operation Flood** began on 13 January 1970 and ran in three phases until 1996.
- India overtook the USA as the **world's largest milk producer in 1998**.
- **National Milk Day** (26 November) marks Verghese Kurien's birthday.

◆ Objective of Operation Flood

To organize cooperatives of milk producers into a nationwide grid, for:

- (a) Increasing milk production (a flood of milk)
- (b) Bringing producer and consumer closer by eliminating middlemen
- (c) Augmenting rural income
- (d) Ensuring reasonable price for consumer

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The Programme Implementation

Operation Flood was implemented in 3 phases:

Phase 1 (1970-80): It was financed by the sale of skimmed milk powder and butter oil gifted by the European Union (then the European Economic Community) through the World Food Programme. The NDDB planned the programme and negotiated the details of EEC assistance. During its first phase, Operation Flood linked 18 of India's premier milk-sheds with consumers in India's major metropolitan cities: Delhi, Mumbai, Kolkata and Chennai; thus establishing mother dairies in four metros.

Phase 2 (1981-85): Under this phase coverage of the programme increased. Its objective was to establish a modern and self sustaining dairy industry, building on the foundation of Phase-I to meet the nation's needs in milk and milk products.

Phase 3 (1985-96): It helped in the consolidation of the dairy cooperative movement in India. Under it, the infrastructure was expanded and strengthened to procure and market the increased amount of milk produced. It gave emphasis on research and development in animal health and animal nutrition, veterinary services like vaccines, etc.

Critical Analysis

POSITIVES

- **Increased Milk Production:** Before the launch of 'Operation Flood' national milk production grew at 0.7%, but with the initiation of the programme, it grew at more than 4%.
- **Poverty Alleviation:** Dairying became an important source of income especially for small and landless farmers. About 60% of the beneficiaries of the programme were small and landless farmers. Thus, it acted as an important poverty alleviation tool.
- **Access to Technical Inputs:** A major impact of the programme was access to technical inputs. The farmers were provided with technical inputs including artificial insemination, balanced cattle feed with mass protein feed, urea enriched straw, better fodder varieties, assured veterinary services, etc.
- **Empowered Women:** 'Operation Flood' along with NGOs like Self-Employed Women's Association (SEWA) established about 6000 women dairy cooperative societies, managed by women. This enabled women participation in decision making at various forums.
- **Spawned Dairy Machinery Industry:** With this programme, there was an impetus to indigenous dairy equipment manufacturing industry , which later began exporting equipment.
- **Employment Opportunities:** The Operation flood opened new employment and income avenues for the vulnerable sections in rural areas; thus, slowing down the mass migration to the cities
- **Export of Milk Powder:** India became milk surplus country from being dependent on imports and gifts of milk powder and other dairy products. In a decade of launch of the programme, it began to export milk powder.
- **Elimination of Intermediaries:** The programme exterminated middlemen who were creaming off most of the profits by forcing unremunerative prices on dairy farmers.

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NEGATIVES

- **Benefits to a Few:** Around 90 per cent of the milk produced each year came from 12 states like Uttar Pradesh, Punjab, Haryana, Rajasthan, Maharashtra, Tamil Nadu and, of course, Gujarat. Even in these states, the bulk was confined to a few pockets. It has been found that it benefited the affluent section.
- **Strengthened Intermediaries:** Far from eliminating the exploitative intermediaries/ elements cooperatives helped them to emerge as political power centres.
- **Opaqueness of NDDB:** The NDDB which spearhead the programme has been criticized for its opaqueness to government scrutiny.

CONCLUSION

'Operation Flood' was not just a dairy development programme. It saw dairying as a path towards development; an initiative for employment generation and to alleviate poverty. Thus, it helped in socio-economic endeavours of the country.

> UPDATE 2026 DAIRY TODAY
>
> India produced **247.87 million tonnes** of milk in 2024–25, about a quarter of world output. Per capita availability rose to 485 grams a day (Basic Animal Husbandry Statistics 2025). Uttar Pradesh, Rajasthan and Madhya Pradesh are the top three producers.

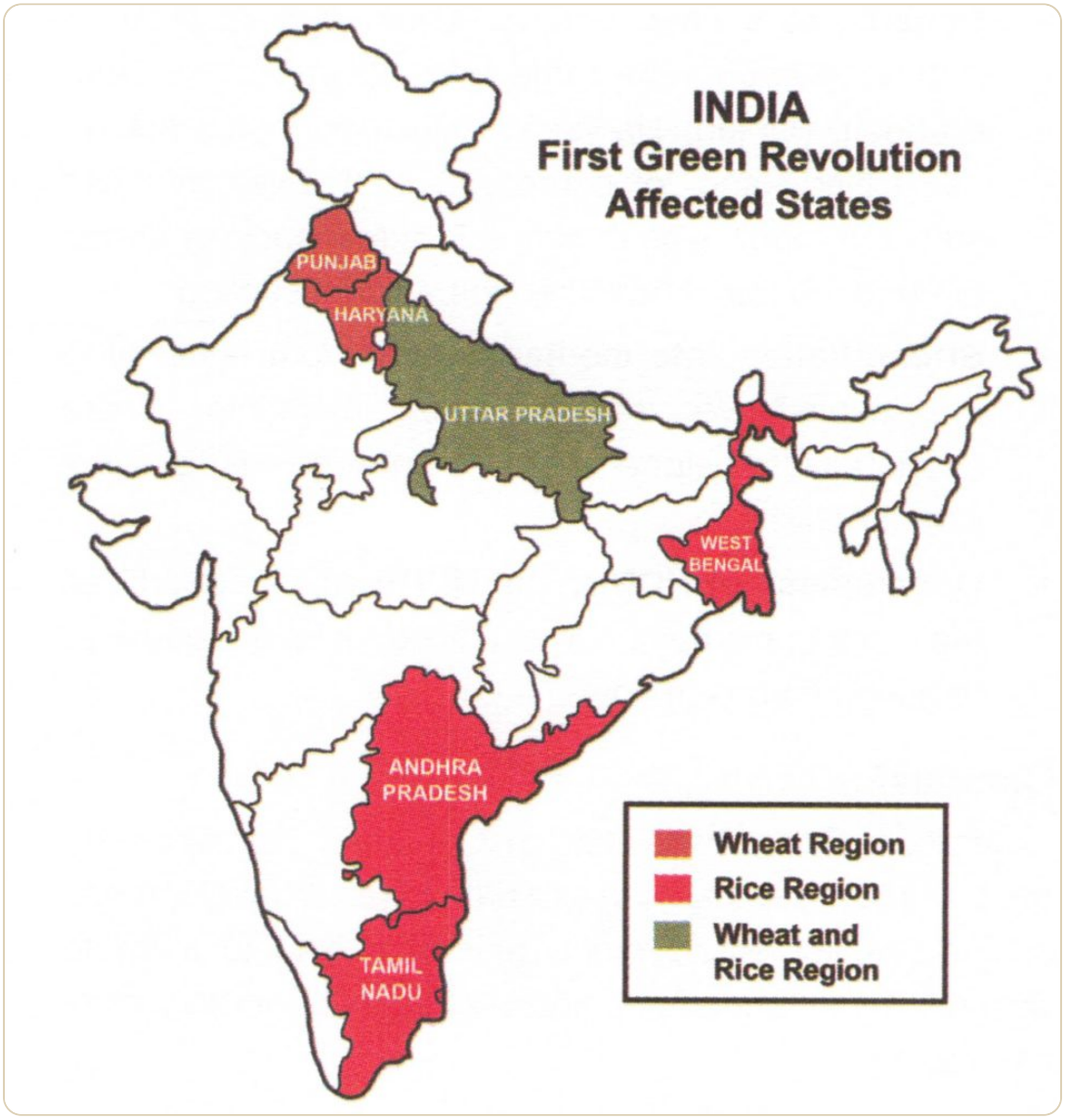
04 Green Revolution

Green Revolution is the phenomenon that is identified with India's transition from an import dependent country for food to a self-sufficient one, which later became a surplus country in food. It is related with major technological reforms undertaken in Indian agriculture from mid- 1960s. The project was led by Dr. M.S. Swaminathan, an Indian geneticist and biologist. Though Indian agriculture grew by about 3% during 1949 and 1965, India faced food shortage particularly from early 1960s. This was a result of rise in population after independence and slow but steady rise in per capita income along with rising outlay towards planned industrialization. Due to these pressures on Indian agriculture, it was not able to fulfill the rising demands.

As a result of this food shortage, India was compelled to import increasing amounts of food. For example, India had to make a controversial agreement to import food from the USA under the PL-480 scheme in 1956. The volume of food imported under this kept on rising year-by-year.

Added to this, India had to fight wars with China (1962) and Pakistan (1965). The situation was further aggravated with droughts in the year 1965-66, which affected the agriculture production domestically. Famine like conditions started setting in. Due to this, food availability went down leading to price rise.

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Threat from the USA

In this backdrop, India fought a war with Pakistan in 1965. The US sympathized with Pakistan. Moreover, India's strong condemnation of American action during Vietnam war did not favour the US. Hence, in order to arm twist India to accept economic policy favourable to it, the US threatened to stop the food exports, which till then had helped India meet its food demand.

Towards Self-Reliance

In the above discussed situation, economic self-reliance, particularly food self-sufficiency became the priority of Indian economic policy. The then Prime Minister, Lal Bahadur Shastri along with Indira Gandhi gave full support to New Agriculture Strategy, under which focus was given on:

- High Yield Variety (HYV) seeds (Mexican dwarf wheat)
- Chemical fertilizers and pesticides Agriculture machinery including tractors, pump-sets etc.
- Soil testing facilities
- Agriculture education programme

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- Institutional credits with focus on areas which had assured irrigation facilities along with supporting agriculture infrastructure.

◆ PRELIMS TRAP WHO DID WHAT IN THE GREEN REVOLUTION

- **Norman Borlaug** (CIMMYT, Mexico) bred the dwarf wheat — Lerma Rojo 64 and Sonora 64. He won the Nobel Peace Prize in 1970 and is called the father of the Green Revolution worldwide.
- **M.S. Swaminathan** brought and adapted the varieties in India; **C. Subramaniam** was the Agriculture Minister who pushed the new strategy.
- For rice, **IR-8** came from the International Rice Research Institute in the Philippines (1966).

◆ Other Measures Taken

- Government investment in agriculture increased significantly.
- Efforts were made to ensure that the farmers have assured markets at remunerative prices. The Agriculture Prices Commission was set up in 1965 to recommend the prices for agriculture produce like wheat and rice. In 1985, it was renamed as the Commission for Agriculture Costs and Prices (CACP) to recommend minimum support prices for multiple food-grains.
- All these initiatives by the government also led to increase in gross capital formation in agriculture.

Critical Analysis

POSITIVES

- **Increase in Agricultural Production**: Food production rose by 35% during 1967-68 and 1970-71. This led to increase in food availability as marketable surplus of food-grains increased.
- **Decrease in Food-Grain Imports**: Net food imports fell from 10.3 million tonnes in 1966 to 3.6 million tonnes in 1970.
- **Food-Grain Exports:** By 1980s, India not only had buffer of food-grains, but it also started exporting food-grains.
- **Prosperity for Farmers**: With the increase in farm production, the earnings of the farmers also increased and they became prosperous. It brought prosperity to farmers.
- **Rural Employment**: It generated more rural employment due to multiple cropping. Moreover, as a result of agro-industries, warehousing for agriculture produce, transport, fertilizers, manufacturing of farm equipments, etc. resulted into increase in the overall employment in the country.
- **Poverty Alleviation**: Further, the surplus generated under the Green Revolution helped the government to launch schemes for employment generation. This had a major impact on the poverty alleviation.
- **Industrial Growth**: The need for agriculture equipment contributed to industrial growth. Besides, demand for chemical fertilizers, pesticides, insecticides, weedicides, etc. also increased considerably.
- **Capitalist Farming:** The attitude of farmers towards farming changed. They started investing in agriculture; thereby, shifting to capitalist farming.

NEGATIVES

- **Regional Benefits**: The benefits of green revolution accrued mainly in Punjab, Haryana and western Uttar Pradesh in the north and Andhra Pradesh and Tamil Nadu in the south that already had certain prerequisites, such as irrigation facilities, capital for investment, among others. It hardly touched the

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Eastern region, including Assam, Bihar, West Bengal and Orissa and arid and semi-arid areas of Western and Southern India

- **Food Crop Centred**: The effect of Green Revolution was primarily felt on food-grains. Major commercial crops like cotton, jute, tea and sugarcane were almost untouched by the revolution. As a result, an excess of production in two main food-grains (wheat and rice) and shortages in mostly others prevailed side by side.
- **Social Inequality**: The benefits of the Green Revolution were cornered by the big farmers, at the expense of small farmers and tenants. This contributed to increase in social inequality .
- **Rural Unemployment:** The mechanization of agriculture led to rural unemployment, especially amongst agricultural labourers. The worst hit were the poor and the landless farmers or people.
- **Environmental Degradation**: Excessive use of chemical fertilizers and pesticides resulted in environmental degradation. Over irrigation, especially in Punjab and Haryana, has depleted groundwater tables and led to salinization of soil in the region.

CONCLUSION

The Green Revolution contributed to the increase of food production in the country; thereby, making it self-sufficient and import independent. It had many spill-over advantages like increase in rural income, employment opportunities, etc. But, at the same time, the environmental consequences of the use of chemical fertilizers were real. As India is embarking on the path of Second Green Revolution, we must learn lessons from First Green Revolution. This will help us to practice environmentally sustainable agriculture in the era of climate change.

05 Food Corporation of India

The Food Corporation of India (FCI) was set up in 1965, under the Food Corporations Act 1964. It was set up for the purchase, storage, movement , transport, distribution, sale of food-grains and other food-stuff. It was set up in order to fulfill following objectives of the Food Policy:

- Effective price support operations for safeguarding the interests of the farmers.
- Distribution of food grains throughout the country for public distribution system (PDS).
- Maintaining satisfactory level of operational and buffer stocks of food grains to ensure National Food Security.

◆ Achievements

- (a) Under it, the level of procurement has increased.
- (b) India’s dependence on import has decreased.
- (c) It has helped in arresting fall in the prices to an unremunerative level for the farmers.
- (d) It has helped the people falling under the BPL category to meet their food requirements.
- (e) It has helped to arrest inflationary pressures.
- (f) Under it, scientific storage capacity has increased in India.

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Challenges

- With the rise in procurement prices of the food-grains, the cost of FCI's functioning has increased.
- The FCI faces the problem of rising costs of storage and distribution.
- There is, also, an issue of excess stock which leads to wastage of food-grains.
- The issue price has decreased, which has affected profits of the FCI.

Prospects

The government in 2014 had appointed Shanta Kumar Panel to suggest measures to improve the efficiency of the FCI. It has recommended decentralized procurement system. It has also recommended to restructure FCI's debt so as to reduce interest burden. These recommendations are yet to be accepted by the government.

UPDATE 2026 FOOD SECURITY SINCE 2014

- The Shanta Kumar committee reported in **January 2015**.
- The **National Food Security Act, 2013** covers up to 75 per cent of rural and 50 per cent of urban people.
- Under the **PM Garib Kalyan Anna Yojana**, foodgrains have been free for NFSA beneficiaries since 1 January 2024, for five years.
- **One Nation One Ration Card** makes ration cards portable across states.

06 Lal Bahadur Shastri Years: Critical Analysis

Though as the Prime Minister of India, Lal Bahadur Shastri had a brief tenure of 19 months, still, he had a significant impact on the course of nation building.

Achievements

- The most important achievement under Shastri was initiation of the Green Revolution and setting up of the National Dairy Development Board (NDDB) which led the country towards White Revolution.
- Under Shastri, Indian Army successfully faltered intentions of Pakistan to annex Kashmir in 1965. Though indecisive, the war of 1965 gave boost to the morale of the army and of the nation as a whole.
- His slogan of 'Jai Jawan Jai Kisan' is still relevant in India.
- Though Shastri refuted the plan to acquire a nuclear weapon, it was during his premiership that the talks for nuclear weapon were held for the first time.
- He set up his own Prime Minister's Secretariat, which later became popular as Prime Minister's Office (PMO).

PRELIMS FACT SHASTRI: TWO FIRSTS

- The **Prime Minister's Secretariat** he created (1964) was renamed the Prime Minister's Office in 1977.
- Shastri was the **first person to receive the Bharat Ratna posthumously** (1966).

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Criticism

- His tenure was criticized for following the policy of drift. Many issues were not solved and were merely left for the later leaders to solve. For example, the issue of the Official Language. Also, Shastri failed to solve the problem of Punjab as a separate state , which later escalated and took a violent turn.
- On the economic front, except agriculture, his tenure did not see much movement and continued to grow at a low rate of around 3.5%, which is known as the Hindu growth rate.

Conclusion

Despite some indecisiveness in the government policies under Shastri, his overall tenure helped India to become self-sufficient and later to become an exporter of the foodgrains. Thus, his tenure led the foundations on which industrial growth could be achieved later.

Quick Revision

- **Shastri as PM**: June 1964 – 11 January 1966, about 19 months
- **Kamaraj Plan**: 1963, senior leaders quit office for party work
- **DMK**: founded 1949 by C.N. Annadurai; won Madras in 1967
- **Shiv Sena**: 1966, Bal Thackeray
- **1965 war**: Rann of Kutch (April), Operation Gibraltar (August), Operation Grand Slam (September)
- **Tashkent Declaration**: January 1966, Soviet mediation
- **Kaira Union**: 1946; Tribhuvandas Patel chairman, Verghese Kurien chief executive
- **NDDB**: 1965, Anand; Kurien first chairman
- **Operation Flood**: 1970–1996, three phases
- **Agricultural Prices Commission**: 1965; renamed CACP in 1985
- **FCI**: 1965, under the Food Corporations Act, 1964
- **PL-480**: US food aid agreement, 1956
- **Green Revolution core**: HYV seeds, fertilisers, irrigation, credit, assured prices

Previous Year Questions

2013 · GS I · MAINS · 10 MARKS

Write a critical note on the evolution and significance of the slogan, ‘Jai Jawan Jai Kisan’.

Approach: Context of 1965: war with Pakistan, drought and dependence on PL-480 wheat. Evolution: Jai Vigyan (1998) and Jai Anusandhan (2019). Significance: soldiers and farmers as twin pillars of security; it framed the Green Revolution as a national cause. Critical note: farm distress and the gap between slogan and policy.

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2013 GS I · MAINS · 10 MARKS

Analyze the circumstances that led to the Tashkent Agreement in 1966. Discuss the highlights of the Agreement.

Approach: Circumstances: Rann of Kutch clash, Operation Gibraltar and Grand Slam, the inconclusive war, the UN ceasefire, and Soviet interest in a role in South Asia. Highlights: return to pre-war positions (Haji Pir returned), no force to settle disputes, return of prisoners, restored diplomatic and trade ties. Note the criticism at home over Haji Pir.

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UNIT V

2 CHAPTERS

Science, Security and Development

India's nuclear programme from Bhabha to Pokhran-II, and the growth of education, science, space and industry after 1947.

CHAPTERS

14 India's Nuclear Programme 212

15 Educational, Scientific and Industrial Developments 224

TOPICS COVERED IN THIS UNIT

14 **India's Nuclear Programme**

Emergence of Nuclear Power Program · Three Stage Nuclear Power Program · Views of famous leaders in the initial phase · Present Scenario · India's Nuclear Weapons Program (1944-1974) · Nuclear Weapons Program (1974-98) · India as a Nuclear Power: 1998 and beyond

15 **Educational, Scientific and Industrial Developments**

Historical Background · Scientific Developments in India

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POST-INDEPENDENCE HISTORY | GS PAPER I · PRELIMS

India's Nuclear Programme

The situation at the time of India's independence needs to be understood the genesis and the evolution of nuclear power program in India. India at independence inherited an economy which was deficit in food grains, pulses, oil, sugar and protective foods. Even the industrial growth was abysmally low. Moreover, illiteracy, poverty, droughts and floods were endemic.

Thus, in those conditions, it was imperative for the government to provide its citizens with basic necessities like food, shelter and clothes. To fulfill this premises, industrial growth was a precondition. However, Indian industrial growth was affected due to the lack of a steady supply of electric power.

Electric power, a key to rapid industrialization and vital for irrigation and agricultural operations, was in short supply. In the initial years, both the installed capacity and the actual generation of electricity, were abysmally low. Around this time, Homi Bhabha observed that the standard of living of the people was closely related to the per capita consumption of energy.

A quantum jump in the installed electricity generating capacity was necessitated and suggested. And this required careful examination of the various sources of energy and of the alternatives available for tapping them on a commercial scale , for generating electricity.

SYLLABUS

PRELIMS — History of India and Indian National Movement

MAINS · GS PAPER I — Post-independence consolidation and reorganization within the country

CONTENTS

01 Emergence of Nuclear Power Program
02 Three Stage Nuclear Power Program
03 Views of famous leaders in the initial phase
04 Present Scenario
05 India's Nuclear Weapons Program (1944-1974)
06 Nuclear Weapons Program (1974-98)
07 India as a Nuclear Power: 1998 and beyond
08 Previous Year Questions

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Evaluation of different alternatives

- **Hydro**: Nuclear physicists, like Homi Bhabha were pessimistic over the feasibility of hydel power and claimed that the capital cost of hydro-electric power in India, was higher.
- **Solar:** At that time, solar energy faced technological and financial hurdles and also the Energy Density of solar energy and temperature, at which it was available, ruled out its commercial potential.
- **Wind:** Naturally India was at a dis-advantageous position, as the wind speeds were not enough to contribute significantly to electricity generation.
- **Other source**: Energy sources like Geo-thermal, Tidal, Ocean Thermal, etc were constrained by their locations and limited potential. Tidal and wave energy were restricted to a few pockets of the coastline and were, perhaps, uneconomical to exploit. The capital costs for Ocean Thermal Energy conversion (OTEC) was too high. Oil and gas were so scarce that they were totally ruled out for electricity generation
- **Coal:** Though coal was the premier energy source in India, it had certain disadvantages. According to Homi Bhabha, coal had to be transported many hundred miles to thermal power stations incurring considerable capital expenditure on the expansion of transportation facilities.
- In case of power station being situated at the pithead, the transmission of electricity to centers of consumption was necessary which required investment in transmission lines, other electrical equipments and in the development of the technology of extra high voltage power transmission. Apart from these constraints, there were environmental impacts like ash generation and Sulphur Dioxide emission.

01 Emergence of Nuclear Power Program

Against this backdrop, evolved the commercially viable nuclear energy programme. The most important factor in favour of nuclear energy program was the abundant availability of raw materials, economics of nuclear power, safety and ecological aspects.

It was globally known that India possessed the largest amount of Thorium deposits in Monazite sands along the beaches of Kerala, Tamil Nadu, Orissa and Andhra Pradesh. On the energy potential of Uranium and Thorium, Bhabha claimed that the reserves of Uranium and Thorium were equivalent to 600 thousand million tonnes of coal, which was more than 15 times the known reserves of coal at that time.

Energy Potential from Coal and Nuclear Fuels

FUEL TYPE	ENERGY (IN KWH)
Coal	160×10^{12}
Uranium	7.2×10^{12}
Uranium in fast reactors	200×10^{12}
Thorium in fast reactors	1280×10^{12}

The above table shows the huge energy potential from the Uranium and Thorium deposits in India.

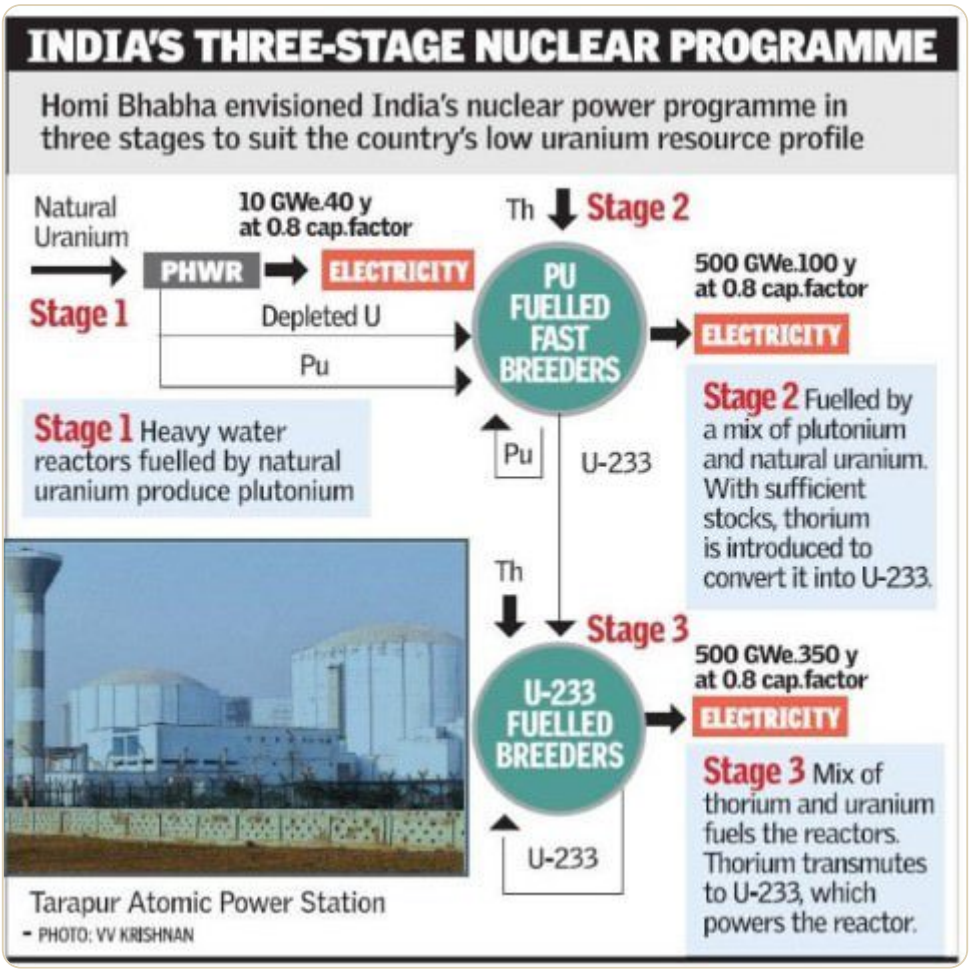
Bhabha also argued that nuclear power was cheaper than coal-fired power . Here, it must be observed that the Energy Density or flux of Uranium fission is far higher than any other known source of power generation.

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These arguments finally convinced the Indian policymakers and paved the way for the Indian three stage nuclear program.

02 Three Stage Nuclear Power Program

In view of the limited fossil fuel availability within the country, a long term strategic nuclear power program, formulated by Dr. Homi Bhabha, embarked on the three stage program. It linked the fuel cycle of Pressurized Heavy Water Reactor (PHWR) and Fast Breeder Reactor (FBR) for judicious utilization of our limited reserves of Uranium and vast Thorium reserves. The emphasis of the program was self reliance and Thorium utilization was a long term objective.



Stage-1: Pressurised Heavy Water Reactor: It envisages construction of Natural Uranium Heavy Water moderated and Cooled Pressurized Heavy Water Reactors (PHWRs). Spent fuel from these reactors is reprocessed to obtain Plutonium.

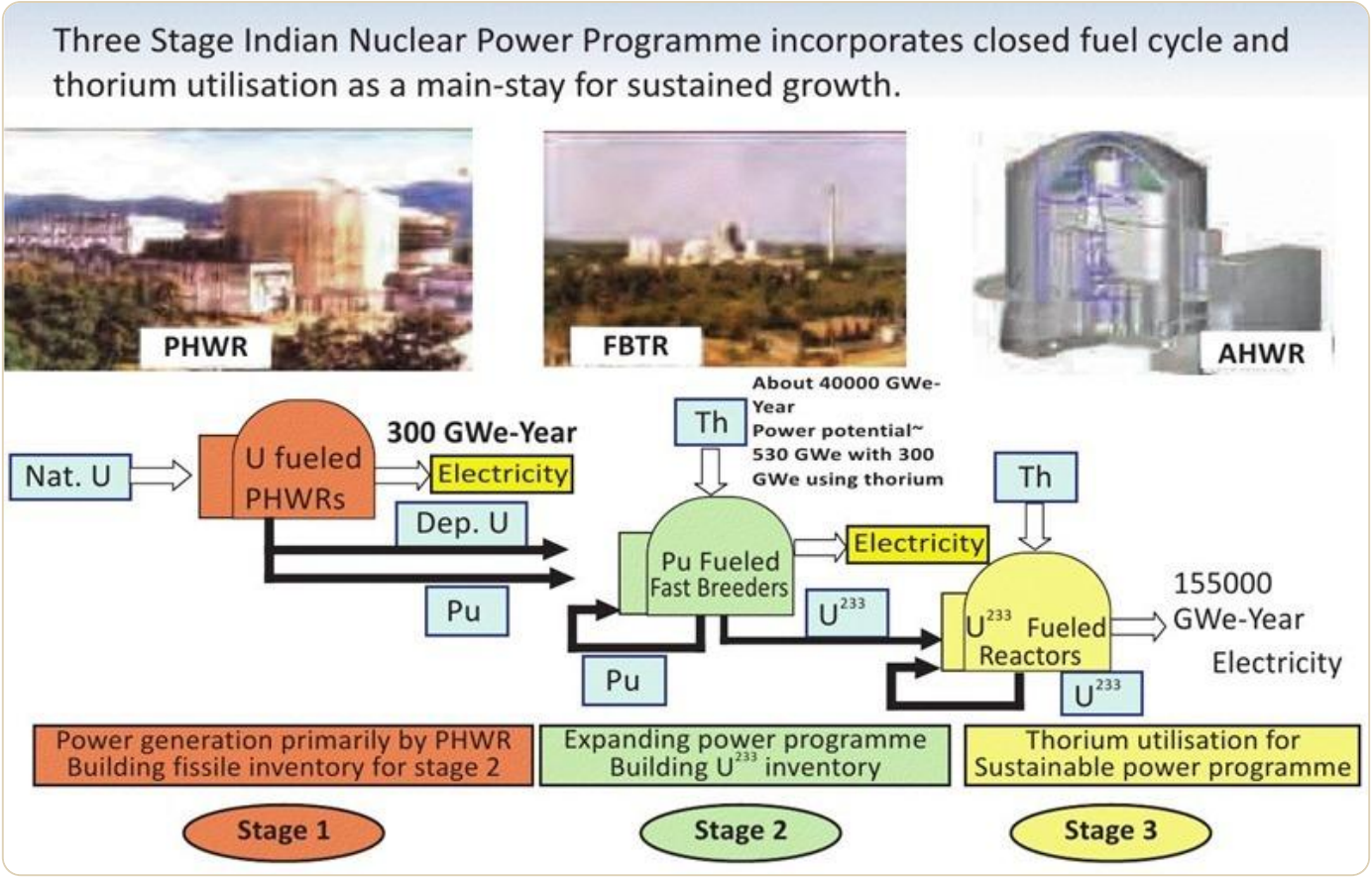
Stage-2: Fast Breeder Reactor: It envisaged construction of Fast Breeder Reactors (FBRs) fueled by Plutonium produced in stage 1. These reactors would also breed U-233 from Thorium.

Stage-3: Breeder Reactor: It would comprise power reactors using U-233/Thorium as fuel produced in stage 2.

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◆ **PRELIMS TRAP** THE THREE STAGES IN ONE LINE EACH

- **Stage 1**: PHWRs burn **natural uranium** and leave plutonium-239 in the spent fuel.
- **Stage 2**: fast breeder reactors burn **plutonium** (as mixed oxide fuel) and breed more fuel. A thorium blanket turns thorium-232 into **uranium-233**.
- **Stage 3**: reactors run on the **thorium–U-233** cycle; the Advanced Heavy Water Reactor is the planned design.
- India has modest uranium but some of the world's largest thorium reserves, in monazite sands.



03 Views of famous leaders in the initial phase

Jawaharlal Nehru

- Nehru once opined that the use of atomic energy for peaceful purposes was far more important for a power-starved country like India than the industrially advanced countries.
- According to Nehru, "On one hand the nuclear bomb and the destruction of Hiroshima and Nagasaki illustrates the horrendous revolution that was taking place in military technology and on the other, the application of nuclear energy to peaceful and constructive purposes has opened up limitless possibilities for human development, prosperity and overabundance."

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Lal Bahadur Shastri

- Lal Bahadur Shastri also favoured the use of nuclear technology to promote socio-economic growth of the country. He once said that India believes that atomic energy should only be used for peaceful purposes.

04 Present Scenario

After decades of operating pressurised heavy-water reactors (PHWR), India also became successful in the second stage when a 500 MW Prototype Fast Breeder Reactor (PFBR) at Kalpakkam attained first criticality on 6th April 2026. However, experts estimate that it would take India many more FBRs and at least another four decades before India could build up a sufficient fissile material inventory to launch the third stage.

- **UPDATE 2026** STAGE 2 BEGINS: PFBR, 2026

The **500 MWe Prototype Fast Breeder Reactor** at Kalpakkam reached **first criticality on 6 April 2026**. It was designed by the Indira Gandhi Centre for Atomic Research and built by **BHAVINI**, and its construction began in 2004. It uses uranium–plutonium MOX fuel and liquid sodium coolant, and marks India's formal entry into the second stage.

- **UPDATE 2026** NUCLEAR POWER POLICY, 2025–26
  - India had about **8.2 GW** of nuclear capacity in 2025 (about 2–3 per cent of electricity) and aims for **100 GW by 2047**.
  - The 2025 Union Budget set up a Nuclear Energy Mission for **small modular reactors**.
  - The **SHANTI Act, 2025** repealed the Atomic Energy Act, 1962 and the Civil Liability for Nuclear Damage Act, 2010. It allows licensed Indian private companies to build and run nuclear plants.

05 India's Nuclear Weapons Program (1944-1974)

World war II changed the power dynamics in the international scenario. After this the following events brought the nuclear threat to the Asian region:

- The nuclear catastrophe of August 1945.
- The calamitous partition of British India into India and Pakistan in August 1947.

◆ Reasons for origin of Nuclear Weapons Program

- The legacy of partition and continuous skirmishing across the border and outbreaks of war (in 1947, 1965, and 1971) gave India and Pakistan ample motivation to develop potent weapons to gain advantage over or restore balance with each other.
- Another motivation for India's acquisition of nuclear weapons was the potential threat and regional challenge presented by the nuclear-armed state of China:
  - Disputes covering 80,000 square kilometers existed with China

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    - These territorial disputes erupted into the Sino-Indian War on 20th October 1962, when China launched a massive attack on India.
    - The events that followed like the withdrawal of support by the Soviet Union in crisis time, and last minute appeals to USA for help, added strength to the voices in political circles demanding for development of nuclear weapons.
- Finally, it was a matter of prestige that Indians took onto themselves for developing a nuclear weapon at the time when India, a country with a great and renowned civilization, was not included into the UNSC and looked down upon by the West.

Hence, development of nuclear weapons started program in India. An interesting feature unique to Indian program was that the program, from its outset, has remained answerable only to the Prime Minister's office, and only the Prime Minister and a select few of his nominees had any say in its development and acquisition.

◆ Evolution of the program

- The new government of India passed the Atomic Energy Act in 1948, leading to the establishment of the Indian Atomic Energy Commission (IAEC).
- After a decade of infrastructure development and R&D, the turning point came in the early 1960s when India was growing wary of the Chinese nuclear program. At this juncture, India secretly started work on the possibility of developing a nuclear weapon at the Tata Institute of Fundamental Research (TIFR), Mumbai.
- The first formal demand for the development of nuclear weapons was made in parliament in December 1962, after the humiliating defeat of the Indo-Sino war ,in 1962.
- After Nehru's death in 1964, Lal Bahadur Shastri became the PM. PM Shastri, a Gandhian, was strongly opposed to pursuing the nuclear option.
- After the Chinese nuclear test on 16th October 1964, Shastri maintained his opposition to Indian Nuclear Program. While Bhabha argued that "atomic weapons give a state possessing them in adequate numbers a deterrent power against attack from a much stronger state".
- After due deliberation and as the political pressure mounted, Shastri finally authorized the development of nuclear explosives.
- The point of convergence for contradictory opinions was a "peaceful nuclear explosive" or PNE program, which was the only feasible way. This situation arose because India was very vulnerable to the sanctions that an acknowledged weapon program would produce.
- In April 1965, Shastri gave Bhabha, the needed formal approval to move ahead with nuclear explosive development. On 5th April 1965, Bhabha initiated the effort by setting up the nuclear explosive design group Study of Nuclear Explosions for Peaceful Purposes (SNEPP).
- Bhabha selected Raja Ramanna – Director of Physics at Atomic Energy Establishment, Trombay (AEET) – to lead the effort .
- India's nuclear program was of great concern to Pakistan. Pakistan, soon, approached China and was able to win its support for Pakistan's nuclear program.
- George Perkovich an American Political Scientist, suggested that it was fear of the changes in the balance of power that India's nuclear weapon program would bring, which motivated Pakistan to initiate the Second Indo-Pakistani War in 1965.

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- The outcome of the war strengthened India's long-term resolve to acquire nuclear weapons. Moreover, the alliance between U.S. armed Pakistan and nuclear-armed China presented India with a security threat which India could not ignore.
- At this juncture, the program received a huge jolt with the sudden demise of two stalwarts, Shastri and Bhabha.
- The other interesting factor to note is that, largely, the nuclear scientists pursued this program, with no involvement of the military in planning or decision making.
- The program, later, revived in 1967 under the leadership of PM Indira Gandhi and continued uninterrupted until it culminated in a successful nuclear test less than seven years later.

PRELIMS TRAP INSTITUTIONS AND REACTORS OF THE EARLY YEARS

- **Atomic Energy Commission**: 1948. **Department of Atomic Energy**: 1954, directly under the PM.
- **AEET Trombay** (1954) was renamed **BARC** in 1967, after Bhabha died in an air crash on Mont Blanc in January 1966.
- **Apsara** (1956) was Asia's first research reactor. **CIRUS** (1960), built with Canada, produced the plutonium for 1974.
- **Tarapur** (1969), built with US help, was India's first nuclear power station.

Reasons for revival

- Indira Gandhi directly approved the new effort at the urging of her new principal secretary Parmeshwar Narain Haksar.
- Growing aggression of China, which exploded a thermonuclear device in 1967, and moved its troops into disputed areas.
- India's supply of separated Plutonium was slowly accumulating.
- Some historians argue that the new effort was begun at the initiative of the scientists involved.

By 1972, favourable conditions existed for PM Indira Gandhi when she gave a nod for construction of the nuclear device but to hold onto its testing.

Operation Smiling Buddha (1974)

On May 18th, 1974 India conducted its first nuclear test in the deserts of Pokhran, Rajasthan. With it, India became the **world's sixth nuclear power after the United States, Soviet Union, Britain, France and China** to successfully test out a nuclear bomb. Throughout the development of this device, more formally dubbed as the **'Peaceful Nuclear Explosive', or PNE** program, but, commonly, called 'Smiling Buddha', very few records of any kind were kept either on the development process or the decision making involved in its development and testing.

The rationale of a PNE continued till the nuclear explosion in 1998, when India formally designated itself a nuclear weapons state.

INTERNATIONAL RESPONSE

- While the initial International reaction was negative, the test escalated international attention to proliferation, and support for India's nuclear program from abroad, disappeared.

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- The US took offense to India barging into the nuclear society, without any warning and then, blocked aid to India and imposed numerous sanctions. Canada cut off nuclear assistance after the test, which brought two nuclear power projects – Rajasthan II reactor and the Kota heavy water plant – to a halt. The nuclear non-proliferation regime that exists today came about as a direct result of this test.

ANALYSIS OF TEST

The impact of the test on India's civilian nuclear program was severe, as below:

- The progress of civilian nuclear power program was crippled by the lack of indigenous resources and the then cut-off of imported technology and technical assistance.
- It can be said that no effort was put into analyzing the likely international reaction to the PNE, or in preparing the nuclear power program for the after-effects, in case of imposition of bans.
- The test produced little information of scientific value for peaceful uses or otherwise, beyond the demonstration that the device actually worked.

06 Nuclear Weapons Program (1974-98)

The driving force behind the development of the Peaceful Nuclear Explosive (or PNE) was the initiative of the scientists at BARC. This mission and unity fostered, was lost after the test in 1974 due to a set of events.

The initial popularity that PM Gandhi gained after the test, started waning thereupon. Gandhi came to feel that her decision to break with Nehru's policies was for no gain, and she gradually lost interest in the program.

Developments till 1990

State of Dormancy

- The Indian nuclear program was left with a vacuum of leadership and even basic management. During the emergency (1975-77), the nuclear programs languished. PM Gandhi was defeated in the general elections in 1977.
- The new PM Morarji Desai opposed nuclear tests, peaceful or otherwise, and the nuclear option, throughout his term in office. Hence, continued the political opposition and, also, the organizational chaos in BARC.
- In 1979, the Soviet Union invaded Afghanistan and the position of Pakistan, both militarily and economically, was strengthened by the U.S. which was wary of the Soviet Union.
- Indira Gandhi returned to power, with a revitalized leadership and the program moved only to be halted by the PM under the US pressure.

In 1980s

- India's civil nuclear program crippled under the international sanctions after the 1974 test; during the 1980s also, the situation was similar, as attempts to import nuclear reactors met with the condition that India operates them under the IAEA safeguards, to which the weapons establishment was seriously opposed to.

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- In the early 1980s, it was, also, clear that none of India's principal problems – economic development and internal stability – could be aided with nuclear weapons, a fact that diverted interest from testing or further development.

During Rajiv Gandhi Era

- Rajiv Gandhi, who became PM after the assassination of his mother in 1984, had a strong antipathy to nuclear weapons and did not support testing or the refinement of weapon designs, and laboratory research required to support further advances in nuclear arms. Rajiv Gandhi felt that India needed access to the advanced technology of United States and the nuclear program was a hindrance in that direction.
- However, both BARC and DRDO continued to develop and refine weapon designs and related technologies in the laboratory and on the testing ground. An authoritative study group was set up in November 1985 to formulate India's nuclear policy and determine the means needed to implement it. The outcome of the group's deliberations was to recommend building a minimum deterrent force with a strict no first use policy.
- In December 1985, Zia ul Haq of Pakistan and PM Rajiv Gandhi met in New Delhi and agreed to a pact not to attack each other's nuclear facilities. The year 1989 marked a turning point in the strategic situation in South Asia because it was in this year that both Pakistan and India began creating real nuclear arsenals by stockpiling complete and ready-to-assemble weapons.

> PRELIMS FACT THE NON-ATTACK AGREEMENT
>
> The **Agreement on the Prohibition of Attack against Nuclear Installations and Facilities** was signed on **31 December 1988** and came into force in 1991. Since **1 January 1992**, India and Pakistan have exchanged lists of their nuclear installations every New Year's Day.

In 1990s

- From late 1990 to mid-1991, India went through considerable political instability. During this period, no effort was made to formulate an actual nuclear doctrine – policies and strategies defining how India would manage this new nuclear capability.
- Narasimha Rao, the Prime Minister from 1991 to 1996, placed a strong emphasis on economic development, closer ties to the West, and instituted an effective economic program based on liberalization of the economy. He was strongly against overt declarations of nuclear capability that would incur crippling sanctions against India.

India and Non-Proliferation

In 1995, The Nuclear Non-Proliferation Treaty (NPT) came up for review and extension. India endorsed the NPT in principle, but refrained from signing it because India objected to the establishment of 'legitimate' nuclear weapon states limited to the 5 nuclear armed nations then in existence.

India refused to sign the NPT unless the nuclear states committed themselves to a specific timetable to accomplish nuclear disarmament.

The nuclear powers pushed two treaties that provided for restrictions on specific proliferation activities – the Comprehensive Test Ban Treaty (CTBT) to prohibit all nuclear tests, and a treaty to cut-off the production of fissile materials for weapons.

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Both of these treaties were believed to have serious effects on states with less well developed arsenals – like India and not on states with pre-existing arsenal.

PRELIMS TRAP INDIA AND THE NON-PROLIFERATION REGIME

- **NPT** (1968): India has never signed it. **CTBT** (1996): not signed.
- **NSG**: India got a one-time waiver in **September 2008** but is not a member.
- India joined the **MTCR** (2016), the **Wassenaar Arrangement** (2017) and the **Australia Group** (2018).

Operation Shakti: 1998

Finally, after the 1998 elections, PM Vajpayee ordered the famous 1998 nuclear tests at Pokhran. India carried out five tests, three on 11th and two on 13th May 1998. After the first test, Prime Minister Atal Bihari Vajpayee famously said: "India is now a nuclear weapons state. We have the capacity for a big bomb now. Ours will never be weapons of aggression".

International responses

The test did not go down well with the international community.

- Pakistan immediately claimed that it was ready for a nuclear test and ready to counter India's aggression, if any
- China warned that India's nuclear tests would harm peace and stability in South Asia and expressed serious concern about the tests.
- The United States claimed that it was deeply disappointed by the decision of the government of India to conduct three nuclear tests. It also said that these tests run counter to the effort the international community was making to promulgate a comprehensive ban on such testing.
- The US imposed economic sanctions on India as punishment. Most other nations refrained from joining the US, in imposing economic embargoes. Since most nations were not imposing similar sanctions, and India's exports and imports together constituted only 4% of its GDP, with US trade being only 10% of this total, the overall effect on India's economy from a direct trade embargo was small. Far more significant were the restrictions on lending imposed by the United States and its representatives on international finance bodies, in India
- Finally, in the same month on 28th May 1998, Pakistan also detonated nuclear weapons, hurriedly, responding to India's tests.

07 India as a Nuclear Power: 1998 and beyond

After this series of nuclear tests in the south Asian region, tensions escalated near borders owing to cross border firing and also testing of tactical delivery weapons by both the nations i.e., Agni by India and Ghauri by Pakistan. The US and international communities feared a nuclear war between the two South-Asian nations.

The two nations did get involved in a conflict along the line of control in the Kargil sector in Kashmir, but, thankfully, it did not blow out into a nuclear war. After the Kargil conflict in summer of 1999, India declared its nuclear policy.

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SALIENT FEATURES OF INDIAN NUCLEAR POLICY

- One of the cornerstones of India's official nuclear policy is No First Use (NFU) of nuclear weapons. But nuclear weapons could be used first if Indian forces are attacked with biological or chemical weapons.
- India asserted a right to possess nuclear weapons, and would pursue a policy of credible 'minimum' nuclear deterrence and shall use nuclear weapons only to retaliate against a first strike.
- India's peacetime posture was aimed at convincing any potential aggressor that any threat of use of nuclear weapons against India would invoke measures to counter the threat.
- It further stated that India would not use nuclear weapons against a state that does not have them or is not aligned with a nuclear-armed power, and that nuclear weapons would be tightly controlled and launched only with the authorization of the Prime Minister, or a designated successor.

MAINS ANSWER ANGLE WRITING ON INDIA'S NUCLEAR STORY (ASKED IN GS III, 2017 AND 2018)

For 'growth and development', use the chapter's arc: Bhabha's vision, the three stages, isolation after 1974 forcing self-reliance, Pokhran-II, the 2008 deal, and the PFBR in 2026. For 'facts and fears', set clean, firm base-load power and thorium security against cost, delay, waste, liability and the Fukushima-type safety worries seen at Kudankulam.

Quick Revision

- **Homi J. Bhabha**: architect of the programme; three stages proposed in the 1950s
- **Atomic Energy Act**: 1948; AEC set up the same year
- **China's first test**: 16 October 1964
- **SNEPP**: 1965, Study of Nuclear Explosions for Peaceful Purposes
- **Smiling Buddha**: 18 May 1974, India the sixth nation to test
- **Canada**: cut nuclear cooperation after 1974
- **Operation Shakti**: 11 and 13 May 1998; Pakistan tested on 28 May
- **Nuclear doctrine**: No First Use, credible minimum deterrence
- **PFBR**: Kalpakkam, first criticality 6 April 2026

Previous Year Questions

2018 GS III · MAINS · 15 MARKS

With growing energy needs should India keep on expanding its nuclear energy programme? Discuss the facts and fears associated with nuclear energy.

Approach: Facts: low-carbon, firm base-load power; thorium security through the three stages; small land footprint. Fears: high capital cost and delays (the PFBR took over twenty years), waste, liability, accident risk and local protests (Kudankulam, Jaitapur). Take a balanced position: expand as part of a mix, with strong regulation and new designs such as SMRs.

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2017 GS III · MAINS · 15 MARKS

Give an account of the growth and development of nuclear science and technology in India. What is the advantage of fast breeder reactor programme in India?

Approach: Growth: AEC (1948), Apsara (1956), Tarapur (1969), Pokhran (1974, 1998), indigenous PHWRs, the 2008 deal, and medical and agricultural uses. FBR advantages: breeds more fuel than it burns, multiplies the energy from limited uranium, and is the bridge to thorium. Cite the FBTR and PFBR at Kalpakkam.

2020 PRELIMS

In India, why are some nuclear reactors kept under "IAEA safeguards" while others are not?

a Some use uranium and others use thorium

b Some use imported uranium and others use domestic supplies

c Some are operated by foreign enterprises and others are operated by domestic enterprises

d Some are State-owned and others are privately-owned

Answer: (b). Under India's 2008 separation plan, reactors running on imported fuel are placed under IAEA safeguards; the others stay outside them.

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