



YOJANA AND KURUKSHETRA

Webinar Handout

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YOJANA (AUGUST 2022) AND KURUKSHETRA (JULY 2022)

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1. Role of Art and Literature in Indian National Freedom Movement

Context: The development of performing art through cinema and theatre which depicted India's heroic past inspired patriotism and encouraged participation in the freedom struggle. It has offered an antidote to spreading cultural colonisation.

Mains Paper Syllabus

General Studies 1

- Indian Culture - Salient aspects of Art Forms, Literature and Architecture from ancient to modern times.
- The Freedom Struggle – its various stages and important contributors/contributions from different parts of the country.

Details:

Development of Theatre in India:

- The proscenium theatre in India began in the **two colonial metropolises of Calcutta and Bombay** towards the second half of the eighteenth century.
- However, till 1860s, these theatres were controlled by Bengali elites, which used to present outstanding plays on contemporary social themes like widow remarriage, polygamy, etc.
- The theatres aroused popular interest which eventually led to the emergence of the public theatre.
- These public theatres grew upon the **enthusiasm and determination of the educated, middle class youth** for whom the new medium held enormous scope for entertainment and voicing their opinions.
- The **new public theatre embraced a wider audience and preferences** as its ingredients and started responding to the prevailing socio-political situation over the course of time.

Colonial Reaction:

- The increasing popularity of the **public theatre** made the government sensitive towards portrayals that were "**obscene,**" **lacked in "morality"** and **went against "public interests"**.
- The actor or owner of the theatre flouting these conditions were made liable for punishment.
- Very soon, the **Great National Theatre of Babu Bhuban Mohan Niyogi** was singled out for violating these parameters.
 - The police came down heavily on the theatre for **alleged derision of High Court lawyer, Jagadanand Mukhopadhyay for his excessive loyalty** towards the ruling class.
- Similarly, censorship was clamped on the play, **Surendra-Binodini on grounds of vulgarity and obscenity** even though the real provocation was the depiction of a British official as a rapist.
- **Introduction of Dramatic Performances Act (1876):** It was passed in order to restrict public theatre from using overtly subversive political messages.
 - It conferred **powers on the local governments to censor or stop the performance** or any drama, which may be considered seditious, obscene or defamatory.
 - During the same time, the **Vernacular Press Act** was also passed which was aimed at censorship of the press.
 - This legislation effectively **marked the end of direct political activism**, in the Bengali public theatre.
 - Thereafter, most plays produced by the commercial companies looked mainly at making money.
 - After the enactment of the Act, **making plays commercially viable became the biggest concern** for even director-producers like **Girish Chandra Ghosh** who used to make plays on revolutionary themes.

How Art and literature shaped India's struggle for independence?

- **Evoking nationalist emotions:** The development of Swadeshi Art helped nationalist in their struggle by evoking emotions related to **oppression or kinds of injustice to people** that they had been facing for a long time.
 - **For example,** Zainul Abedin produced sketches of the **horrific conditions during the Bengal famine of 1943** which hit more than **two million people**.
- **Awakening nationalist sentiments:** The shift in the themes of artforms to reflect humanistic sentiments which were earlier dominated by religious and spiritual overtones awakened masses against colonial oppression.
 - **For example,** nationalistic poetries, plays, and stories such as **Vande Matram, Amar Sonar Bangla,** etc. were used for a patriotic purpose and to create a nationalist discourse.
- **Overcoming linguistic barriers:** Swadeshi artform successfully overcame the linguistic differences across the country. In addition, nationalist literature, folk songs, dramas, etc., were in the local language that helped many common people to take part in India's freedom struggle.
- **Awareness Generation:** The rich literary tradition of India was revived by writers like Rabindranath Tagore, Muhammad Iqbal, Bankim Chandra Chattopadhyay, and Kazi Nazrul Islam, etc. They used literature, poetry and speech to **provoke the thought of freedom** to encourage people to fight for the country.
- **Participation of Women:** For example, Bankim Chandra Chattopadhyay's **Devi Chaudharani,** became an inspiration to women to take up the cause of independence since it projected women as the protagonist and leader of the nationalist struggle.
- **Cultural Nationalism:** Swadeshi movement led to the development of the Bengal School of Art, which was a symbolic protest against Cultural colonisation of Indians by Britishers.
- **A tool of propaganda:** The role of Newspapers and journals in propagating nationalistic agenda was immense.
 - **For example,** Newspapers like **Bande Mataram, Jungantar Patrika,** and **Harijan** sought to make Indian citizens not only socially and politically aware but also unite them for one common cause.
- **Spread patriotic feelings:** To spread the message of patriotism and expose atrocities of the British, art and literature were extensively used.
 - **For example,** in **Anandamath,** Bankim Chandra Chattopadhyay highlighted various patriotic acts and sacrifices made by the characters of the novel.

Role of Theatre and Cinema in Freedom Movement:

- The **political and social concerns of the Swadeshi Movement** were aptly reflected in the theatre of the period.
- Indeed, the **theatre was harnessed for political ends** and Nationalism and patriotism were propagated in the garb of other themes.
- The playwrights gave **political interpretations to history and myth,** motivating people to adopt the way of Swadeshi.
- In this regard, Aparesh Chandra Mukhopadhyay has noted down the contributions of **Bankim Chandra Chattopadhyay in literature** and **Girish Ghosh in theatre in translating the spirit of nationalism** to these very powerful outlets of public opinion.
- Over the period of time, mythological plays were replaced by historical plays since they became popular among the masses.
- While these plays definitely **strengthened the financial base of the theatre companies,** the **authenticity and quality of the plays deteriorated** correspondingly.
- More than historical authenticity, the stage used **history to promote nationalism** which became open and available to citizens prepared to pay for admission.
- The first Swadeshi play was **Dinabandhu Mitra's Nil Darpan** that depicted the **horrific tragedy of indigo farmers** in rural Bengal and the British atrocities against them.

- **India's Cinematograph Act:** After implementing the **Dramatic Performances Act in 1876**, the British were quick to understand that cinema had a bigger potential to influence public opinion and they came up with **India's Cinematograph Act** in 1918.
 - It was passed in 1918 during the dying months of World War I. Based on the British Cinematograph Act 1909, Its objective was to censor the content of films to be exhibited for public consumption.
- Unlike the other art forms which were familiar, **cinema was new and dynamic** and the migration from silent films to talkies was fraught with **uncertainty and scepticism**.
- The importance of cinema as **a tool of propaganda was not envisioned** by the British alone but in Congress conference in 1939, at Calcutta, **Netaji Subhas Chandra Bose advised the members from Faridpur district** (now in Bangladesh) to form a **film collective for the spread of cinema**.
- Incidentally, the art magazine **Rupamancha dedicated to film and theatre** was one that started the same year.
- With the advent of talkies, Bengali cinema drew its inspiration from the rich literary traditions from the genius of the **novels of Saratchandra Chatterjee, Bankim Chandra Chatterjee and Rabindranath Tagore**.
- The World War II that ended in 1945 **gifted dark despair to the whole India**, including Bengal wherein film studios suffered losses and lost their enterprise.
 - As per the data from Panna Shah's 1950 book, **The Indian Film**, between 1942 and 1945, **the number of films in Bengali language reduced from 15 to 9**,

Role of Paintings:

- The rich tradition of Indian paintings was revived with the development of **Bengal School of Art** as a **result of the Swadeshi movement** in 1905.
- In a symbolic opposition to the partition of Bengal, **Abanindranath Tagore painted the Bharat Mata** as a voice against western influence.
 - Bharat Mata personified a **Bengali woman as a deity** who was the mother of the nation. He painted her with four attributes i.e. **food, cloth, learning, and spiritual knowledge** that were seen as objects of nationalist goals.
- These swadeshi paintings were used as a tool **to evoke the glorious past of Indian history**. For example, **'The Passing of Shah Jahan'** by **Abanindranath Tagore** as an homage to the Mughal miniature tradition.
- **Revival of Indian heritage:** Raja Ravi Varma is often credited for the revival of Indian heritage since his paintings mostly consisted of Hindu divinities, mythological scenes and Indian life which replaced the romanticised style of 'company paintings'.
- Similarly, Nandalal Bose **created a series of paintings** which invoked and celebrated **the spirit of Indian life and indigenous occupations**. He rejected western style of painting and instead, used **Japanese calligraphy strokes, natural colours and rural-life scenes** to give swadeshi flavour to this paintings.
 - On the insistence of Gandhi, Bose painted **a series of posters for the Congress Committee's Haripura-meet**.
- Another artist from Bengal school of Art, **Zainul Abedin**, created sketches **to show the horrific conditions during the Bengal famine of 1943**, which was a result of policies of the British government in India.
- These Swadeshi paintings were **hugely significant to the Indian Freedom struggle** as they played a pivotal role **in breaking British cultural supremacy, rebuilding self-identity and inspiring pride in indigenous practices** amidst the masses.

Role of Music and Literature:

- With the development of Swadeshi Art, as a **symbolic protest against cultural colonisation of Britishers**, the outlook of music, folk songs and literature shifted from religious and spiritual themes to reflect the socio-political reality of the time.
- During this period, popular writers such as Rabindranath Tagore, Muhammad Iqbal, Bankim Chandra Chattopadhyaya used **literature, poetry and speech** as a tool to **spread awareness against the atrocities by British on Indians** and to provoke the thought of freedom to encourage people to fight for the country.
- Several works of rich literature of that period are closely associated with social reform movements of the 19th century.
 - Novels were written to re-examine evil social customs and practices like **untouchability, caste distinctions**, denial of remarriage of widows, etc.
- National song **Vande Mataram** which became the **mantra of Indian revolutionaries and nationalist leaders** was written in **Bankim Chandra Chattopadhyaya's Bengali fiction Anandamath** in 1882.
- Similarly, Tagore wrote the National Anthem "Jan Gan Man" and Amar Sonar Bangla which awakened and inspired masses to join the freedom movement.

Conclusion:

Cultural Nationalism in India during the freedom struggle grew as a result of great advancements in the field of indigenous art and literature. This has contributed immensely in the course of the freedom struggle to promote fraternity among the masses to get united against the alien rule.

Objective Question:

1. Who among the following is attributed with the famous painting "The Passing of Shah Jahan"?
 - (a) Nandlal Bose
 - (b) Raja Ravi Verma
 - (c) Zainul Abedin
 - (d) Abanindranath Tagore

Answer: (d)

Explanation:

The rich tradition of Indian paintings was revived with the development of **Bengal School of Art** as a result of the Swadeshi movement in 1905.

Option (d) is correct: In a symbolic opposition to the partition of Bengal, **Abanindranath Tagore painted the Bharat Mata** as a voice against western influence.

- In addition, he also made the painting named 'The Passing of Shah Jahan' as an homage to the **Mughal miniature tradition**.

Subjective Question:

2. Art is a reflection on society and the times. Discuss this statement in the light of development of performing art and literature during India's freedom struggle.

(15 Marks, 250 Words)

Did You Know?

Illustrations in Indian Constitution



Figure: Illustrations in Indian Constitution: Scene from Ramayana in Fundamental Rights
Source: scroll.in

- Indian Constitution is one of the **rarest constitutions of the world** that has a **hand-written version with illustrations** that have a close resemblance to Mughal, Jain and Pal treatises.
- Each word was **calligraphed by Prem Behari Narain Raizada** and the illustration for each section was done by **Nandalal Bose and his team from Kala Bhavana, Santiniketan**.
- Each of the **22 parts of the Indian Constitution begins with an illustration**.
- These illustrations were **arranged chronologically from Mohenjo Daro to the national freedom struggle** and also **depicted the diverse geography of India**.
- Some of the examples of illustrations in the constitution are
 - **Citizenship: Vedic period** represented by a gurukul scene.
 - **Fundamental Rights: Scene from Ramayana**, a sketch of Ram, Lakshman and Sita returning home after the battle in Lanka.
 - **Directive Principle of State Policy: Scene from the Mahabharata**, with the discussion between Arjun and Krishna before the onset of the war.
 - **Official Language: Depiction of Mahatma Gandhi walking with a stick in Dandi March**.
- The handcrafted copies of the Constitution were sealed and preserved in helium-filled cases, which were placed in the Parliament library and continue to remain there.

2. Freedom Movement in Central India

Context: The tribal people of India had revolted against the British time and again, particularly in central India even before 1857.

Mains Paper Syllabus

General Studies 1

- The Freedom Struggle – its various stages and important contributors/contributions from different parts of the country.

Details: After winning the **Battle of Plassey in 1757** and **Battle of Buxar in 1764**, the East India Company began efforts to annex Chhattisgarh.

- Most of the central part of Chhattisgarh was under the control of the **Maratha rulers of Nagpur**, and the rest of the area was ruled by different Princely States.
- The British got their first success in 1800, when the **Raja of Raigad signed a treaty with the Company** and made Raigad a part of the Government.
- **They annexed the Maratha empire** after its defeat in the war at Nagpur in 1818, and **began to rule the central region of Chhattisgarh.**

Revolts against Colonial Rule

Several Tribal rebellions in Central India arose much before **the revolt of 1857** to save tribal people from the slavery of the Company's Government. These are as follows:

- **Halba rebellion (1774-1779):** In order to capture **Bastar**, the Britishers, with the help of the **King of Jeypore** and the younger brother of the King of Bastar formed a joint army and attacked **Ajmer Singh**, King of Bastar, in 1774.
 - Ajmer Singh's army of **halba tribesmen** fiercely fought against britishers and conclusively defeated the British army.
- **Tribal rebellion in Bargarh:** In 1833, the Britishers' attempt to capture Bargarh was fiercely opposed by the ruler of Bargarh, Ajit Singh, and his tribal army from Raigad. In this struggle, Ajit Singh was martyred.
- **Tribal rebellion in Tarapur region (Bastar):** In 1842, Dalganjan Singh, **the administrator of Tarapur** refused to raise the annual tax in his area **which was considered an act of rebellion by the British**, and an army was sent from Nagpur to suppress it.
 - To fight against this, the tribal people in the region under the leadership of Dalganjan Singh fought against the British army, however, they were defeated.
- **Tribal rebellion in Dantewada:** In 1842, tribals rose against the order of the British regarding the custom of human sacrifice.
 - The British army from Nagpur was called to suppress this revolt but the tribal opposed them fiercely.
 - After the struggle, the custom of human sacrifice was stopped and a permanent military system was established in Dantewada.

Other Major Revolts:

- **First Revolt of 1857 in Sonakhan:** In 1857, Narayan Singh, the **tribal landlord of Sonakhan of Raipur**, looted the paddy deposited with a moneylender and distributed it to save his people from starvation **when a drought occurred in his zamindari area.**
 - He had informed about it to the British officers posted in Raipur but the **moneylender complained to the British officials** describing the act of Narayan Singh as **robbery.**
 - On the complaint of the moneylender, **Narayan Singh was arrested and imprisoned** in Raipur jail, however, he managed to escape prison.
 - The British sent a large army contingent to Sonakhan to arrest him which faced fierce opposition from Narayan Singh and his tribal army.
 - However, he was arrested and publicly hanged at Raipur.
- **Bhumkal of Bastar:** In 1910, there was a **fierce people's uprising in Bastar** by the **Muria tribesmen of Bastar** who took up an armed revolution against Britishers to establish the 'Muria Raj'.
 - It was led by **Gundadhur** and his tribal army which rattled the entire Bastar region.
 - Initially, **Muria Raj was established in the whole of Bastar** for some time, but Gundadhur's army could not sustain itself against the large army of the British.
- **Jungle Satyagraha:** It was launched in 1922 wherein the **tribals had staged a 'satyagraha' against the authority**, protesting over the **low wages given by the forest department** and the **ban on carrying wood for use in cooking** at home.
 - As a result, large-scale arrests were made in this movement, and satyagrahis were punished.
 - However, the Forest Department brought changes in its functioning and this movement was called off.

Causes of Tribal Revolts in India

- **The practice of Settled Agriculture:** The tribals' mainstay were **shifting agriculture, hunting, fishing and the use of forest produce.** With the influx of non-tribals into the traditional regions of the tribals, the practice of settled agriculture was introduced.
 - This led to a loss of land for the tribal population and the tribals were reduced to being **landless agricultural labourers.**
 - There were restrictions imposed on the use of forest produce, on shifting agriculture and on hunting practices which led to the loss of livelihood for the tribals.
- **Introduction of the outsiders:** The British introduced outsiders like money lenders into the tribal areas which led to severe exploitation of the local tribals. They became bonded labourers under the new economic system.
- **Private ownership by non-tribal landlords:** The tribal societies had a system of joint ownership of land which was replaced by the notion of private property.
- **Society became non-egalitarian:** Tribal society was traditionally egalitarian compared to mainstream society which was marked by caste and class distinctions. With the coming of the non-tribals or outsiders, the tribals came to be classified under the lowest rungs of society.
- **Introduction of Forest Acts:** The Government Forest Act of 1865 and the Indian Forest Act of 1878 established a complete government monopoly over the forested land which was fiercely resisted by tribal people over the long period of time.
- **Introduction of Christian missionaries:** The work of the Christian missionaries also **led to social upheaval in tribal society** and this was also resented by them as they considered the work of missionaries as an **extension of colonialism.**
- **Other reasons:** A section of the tribal rebellion **was a response to the landlords' attempts to impose taxes** on the traditional use of timber and grazing areas, new excise regulations, low country traders' and moneylenders' exploitation, etc.

Weaknesses of Tribal Revolts

- **Localised in Nature:** Tribal uprisings drew a large number of participants but were localised in nature and mostly arose out of local grievances.
- **Lack of effective leadership:** The leadership was semi-feudal in character, backward looking, traditional in outlook and their resistance did not offer alternatives to the existing social set-up.
- **Lack of Nationalistic sentiments:** It seems that several tribal uprisings had a common goal to oust the alien rule but it was not because of some 'national' impulse or common effort, but because they were protesting against conditions that were common to them.
- **Traditional outlook:** These rebellions were centuries-old in form and their ideological and cultural content.
- **Poor strategy and outdated weapons:** The methods and arms used by the fighters in these uprisings were practically obsolete compared to the weapons and strategy as well as deception and chicanery employed by their opponents.

Conclusion:

The history of the freedom movement is about the **collective consciousness of the people to be free, being expressed in the form of struggle.**

- This **collective consciousness of the people** about attaining freedom also includes **tribal consciousness** to attain freedom.
- Historians had been **unfair in recognising the contributions** of these tribal people and time has now come to **recognize their contributions in order to do justice** with the History of freedom struggle.

Objective Question:

1. Which one of the following states of independent India is associated with the Halba Rebellion which occurred in the 18th century?
 - (a) Karnataka
 - (b) Jharkhand
 - (c) Chattisgarh
 - (d) West Bengal

Answer: (c)

Explanation:

Several Tribal rebellions in Central India arose much before **the revolt of 1857** to save tribal people from the slavery of the Company's Government.

Option (c) is correct: Halba rebellion (1774-1779) occurred in response to **Britishers' attempt to capture Bastar (Chattisgarh)** with the help of the **King of Jeypore** and the younger brother of the King of Bastar.

- They formed a joint army and attacked **Ajmer Singh**, King of Bastar, in 1774 which faced fierce opposition from **halba tribesmen**, which finally led to the defeat of the British army.

Subjective Question:

2. "Several Tribal rebellions arose in Central India much before the revolt of 1857 to save tribal people from the slavery of the Company's Government". In this context, discuss the causes and weaknesses of such movements.

(15 Marks, 250 Words)

Did You Know?**Janajatiya Gaurav Divas: November 15**

Figure: Statue of Birsa Munda
Source: Hindustan Times

- The government has declared **November 15** as **Janajatiya Gaurav Divas**, to **honour the contribution of the tribal community** to the nation.
- India is unique in that it has **more than 700 tribal communities** and to recognize the efforts of the tribals in the preservation of cultural heritage and promotion of Indian values of national pride, valour, and hospitality, Janajatiya Gaurav Divas will be celebrated.
- It also happens to be the birth anniversary of the **great tribal leader, Birsa Munda**.
- Through Munda Rebellion (Ulgulan), he mobilised the tribal community against the British, forcing them to introduce laws protecting the land rights of tribals.
- In his all-too-short life, before his death in Ranchi jail at the age of 25, he brought about seminal changes in the lives of tribals across the country.
- He was one among the many tribal leaders who fiercely fought against the British Raj in the 19th and 20th century.

3. Nature Based Solutions for Water Management

Context: The traditional knowledge and solutions from nature always played an important role in maintaining and restoring ecological balance, acting as a source of drinking water, groundwater recharge, and flood control, while ensuring livelihood opportunities for people.

Mains Paper Syllabus

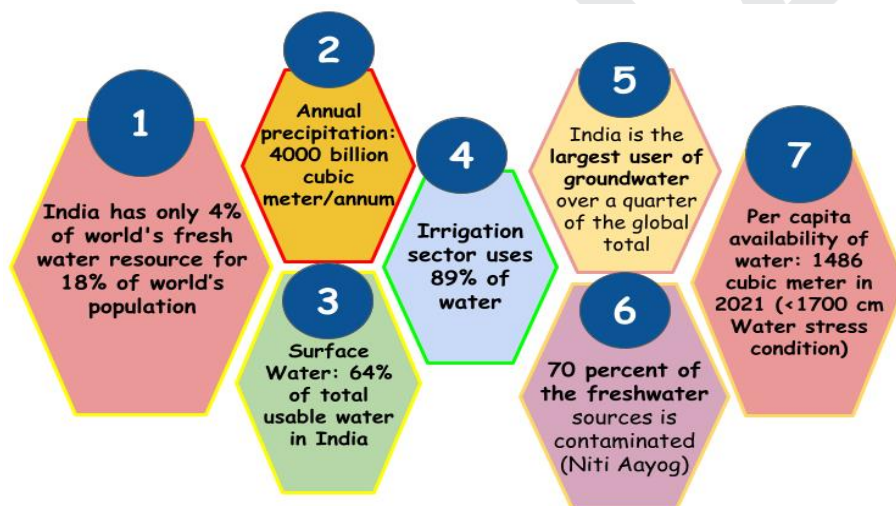
General Studies 1

- Distribution of Key Natural Resources across the world

General Studies 3

- Conservation, Environmental Pollution and Degradation
- Different Types of Irrigation and Irrigation Systems

Water Resource in India



Study	Details
World Bank report	<ul style="list-style-type: none"> • Water scarcity aggravated by climate change could cost some regions up to 6% of their GDP.
NITI Aayog	<ul style="list-style-type: none"> • Over 21 major Indian cities including Delhi, Bengaluru, Hyderabad, and Chennai, would run out of groundwater very soon, affecting nearly 100 million people.
National Institute of Urban Affairs	<ul style="list-style-type: none"> • Intensive monsoon rainfall will exacerbate the probability of flash flooding in about 78 Indian cities. • About 77 coastal urban cities are also prone to frequent cyclones and storms.
Global climate risk index 2021	<ul style="list-style-type: none"> • India is ranked as the 7th most-affected country from climate-related extreme weather events such as storms, floods, heatwaves, etc.

Challenges in Water management

- **Geographical vastness:**
 - High **inter-temporal and spatial variations** in the **availability of water resources** due to varied hydro-meteorological conditions.
 - Eg: **Rajasthan - Arid Zone, North East - Wet region**
- **Increasing Population:**
 - **Per capita availability of water is declining** due to the ever-increasing population.
 - Unprecedented **growth of urban cities** has polluted the **lifelines of cities making the water unfit for drinking** and other purposes.
- **Agriculture:**
 - Agriculture is both a **major cause and casualty** of water scarcity. Farming accounts for almost **70 % of all water withdrawals** and up to 95 % in some developing countries.
- **Ground Water:**
 - **Over extraction of groundwater** has resulted in **adverse environmental impacts** including **declining groundwater levels, deterioration in quality and arsenic and fluoride contamination.**
- **Climate change:**
 - Climate change is causing **erratic rainfall patterns, extensive droughts, extreme heat waves, and intense storms.**
 - More extreme rates of **rainfall and evapotranspiration** intensified the impacts of floods and droughts
- **Other issues:**
 - **Deforestation and conversion of agricultural lands.**
 - **Creating infrastructure beyond the carrying capacity.**
 - **Loss of wetlands and distortion of the watershed.**
 - **Low water use efficiency and poor quality of water.**

Nature-based Solution for Water management

What is Nature-based solution (NBS)

- **Nature-based solutions (NBS)** for water resources management involve the **planned and deliberate use of ecosystem services to improve water quantity and quality and to increase resilience to climate change.**
- It uses tools that are products provided by nature only.
- **Benefits of NBS:**
 - NBS for water management has a **high potential to contribute to the achievement of SDGs and targets of the 2030 agenda for sustainable development.**
 - Enhancing **existing and man-made infrastructure** offering economic, social, and environmental benefits
 - It can not only **restore the provisioning and regulating services of ecosystems** but also **enhance the cultural ecosystem services like grey infrastructure.**
 - NBS can generate economic gains through **immediate job creation, and increase business productivity and tourism.**
- **Case studies:**
 - **China: Restoration of the degraded Loess Plateau benefited over 2.5 million people** with the introduction of **Sustainable farming practices.**
 - Globally, **Mangrove forests can save about USD 80 billion per year** by avoiding losses from **coastal flooding** and protecting up to **18 million people.**
- **Funding:**
 - Still **less than 1.5 %** of all public International climate finance has gone to invest in nature based-solutions in developing countries.
 - Even **less than 1% of water sector Investments** go towards nature-based solutions.

- **Enhancing natural ecosystem services:**
 - **Protecting and increasing the natural ecosystem** will boost sustainable water management.
 - Mangroves help in protecting shorelines from storms, sequestering carbon, Wetlands in filtering contaminated water, Lakes in storing large water supplies, and Floodplains in absorbing excess water runoff.
- **Rainwater harvesting:**
 - It has to be made compulsory in urban planning to store rainwater for at least non-potable uses. It could reduce dependence on municipal water or groundwater.
- **Rejuvenating Local ponds:**
 - The **local Ponds and lakes** act as a **sponge and thermos regulators**, helping areas to accumulate rainwater, enhance groundwater and **regulate micro-climate**.
- **Watershed management:**
 - Watershed management offers a wide range of potential benefits for growing urban settlements.
 - Eg: **New York City watershed treatment** proved that managing watersheds at different levels can offer a clean and safe drinking water supply.
- **Green landscapes:**
 - In cities, **creating urban green spaces** is a holistic and comprehensive approach to **converting concrete Jungle into liveable natural spaces** with blue water bodies and green tree plantations.
 - Endorsing **blue-green first structures, parks and recreational spaces** helps in rejuvenating surface and groundwater.
- **Developing Grey infrastructure:**
 - In urban areas, **Grey building infrastructure** such as promoting green roofs, open and green buildings, planting trees and terrace gardens, recycling and reusing water, etc. is needed to **support and complement natural infrastructure**.
 - Investing in **sustainable drainage systems, and reducing hardened and impervious surfaces** allow water to infiltrate into the ground.
 - Eg: **Sponge Cities of China:** The excessive rainfall is absorbed through soil infiltration and stored in underground tunnels and storage tanks.
 - This water gets discharged into the river only when water levels are not high enough in the river.
- **LiFE Movement initiative:**
 - It was launched by India based on nature-based solutions to modern-day concerns.
 - It helps in promoting an **environmentally conscious lifestyle** that focuses on '**mindful and deliberate utilisation**' instead of 'mindless and destructive consumption of resources'.



Government Initiatives in Water Management

Government Initiatives	Details
Ministry of Jal Shakti	<ul style="list-style-type: none"> It is the nodal agency responsible for policy formulation, planning funding and coordination of programs for sustainable water management. Water is a state subject and the state government plays an important role in the conservation, argumentation and efficient management of water resources.
Pradhanmantri Krishi Sinchayee Yojana (PMKSY)	<ul style="list-style-type: none"> It was launched in 2015 with the motto of Har Khet Ko Paani. It aims to expand cultivated areas with assured irrigation, reduce wastage of water and improve water use efficiency. Micro irrigation: <ul style="list-style-type: none"> The scheme incentivises micro irrigation through subsidies to ensure water use efficiency in the agriculture sector. It promotes appropriate technological interventions like drip and sprinkler irrigation and encourages the farmers to use water-saving and conservation practices.
Jal Jeevan Mission- Har Ghar Jal (JJM)	<ul style="list-style-type: none"> It aims to provide adequate and safe drinking water to every rural household through a functional tap connection by the year 2024.
Catch The Rain 2022 campaign	<ul style="list-style-type: none"> Under Jal Shakti Abhiyan, a campaign with the theme, “Catch the rain where it falls, when it falls” is being conducted from April to November 2022.
National Perspective Plan (NPP)	<ul style="list-style-type: none"> It envisages the transfer of water from the water surplus region through the inter-linking of rivers. Under the NPP, the National Water Development Agency has identified 30 links (16 Peninsular and 14 under the Himalayan Component) to be pursued in a consultative way.
Crops Diversification Programme (CDP)	<ul style="list-style-type: none"> It is being implemented in the virgin and green revolution States from 2013-14, to shift towards less water requiring crops such as oil seeds, pulses, coarse cereals, Nutri cereals, cotton, etc.
Namami Gange Mission	<ul style="list-style-type: none"> Launched in 2014, It is an integrated and multi-sectoral mission to protect, conserve and rejuvenate the Ganga river and its tributaries.
National Water Mission (NWM)	<ul style="list-style-type: none"> The mission was launched in 2009 to ensure equitable distribution of water both within and across States through integrated water resource development and Management.

Conclusion: Learning from the past, **Nature-based solutions are the future to strengthen the resilience of cities, towns, rural areas and people** against **changing climatic trends**. With the rising global challenges of climate change, urbanisation, and biodiversity loss, investment in **Nature-based solutions should be well promoted**.

Objective Question:

1. Which of the following can be methods under Nature-based solutions for water management?
 1. Rejuvenating local ponds
 2. Enhancing natural ecosystem services
 3. Developing grey infrastructure
 4. Creating artificial rain
 5. LiFE movement initiative

Select the correct answer using the codes given below:

- (a) 1, 3 and 4 only
- (b) 1, 2, 3 and 5 only
- (c) 2, 4 and 5 only
- (d) 1, 3 and 5 only

Answer: (b)

Explanation:

Nature-based solutions (NBS) for water resources management involve the **planned and deliberate use of ecosystem services to improve water quantity and quality and to increase resilience to climate change.** It uses tools that are products provided by nature only.

Option 1 is correct: Rejuvenating local ponds and lakes, which will act as sponge and thermos regulators, helping areas to accumulate rainwater, enhance groundwater and regulate micro-climate. Hence, **it is a method under Nature-based solutions for water management.**

Option 2 is correct: Enhancing natural ecosystem services by protecting and increasing the natural ecosystem will boost sustainable water management. Hence, **it is a method under Nature-based solutions for water management.**

Option 3 is correct: Grey building infrastructure such as promoting green roofs, open and green buildings, planting trees and terrace gardens, recycling and reusing water, etc., is needed to support and complement natural infrastructure. Hence, **it is a method under Nature-based solutions for water management.**

Option 4 is incorrect: Artificial rain employs chemicals like **silver iodide, potassium iodide and dry ice** that are sent to the atmosphere to create rainfall. **It is not a nature-based solution.**

Option 5 is correct: LiFE Movement initiative helps in promoting an **environmentally conscious lifestyle** that focuses on 'mindful and deliberate utilisation' instead of 'mindless and destructive consumption of resources'.

Subjective Question:

2. "Nature based solutions can provide sustainable solutions to India's water management challenges". Comment.

(10 Marks, 150 Words)

Did You Know?

Nature based solution: East Kolkata Wetlands (EKW)



Figure: What East kolkata Wetlands can do

Source: timesofindia.indiatimes

- East Kolkata Wetlands (EKW) is the world’s only **fully functional organic sewage management system**. It is a Ramsar site.
- Maintained by farmers and fisher folk, these unique **wetlands receive the city’s sewage, organically treat it with the help of sunshine, oxygen and microbial action** and turn into a productive fish habitat.
- **How does it work?**
 - **Urban waste water** supplied by the municipal corporation is routed through a **series of small inlets**, each managed by a fishery cooperative.
 - The cooperatives **control the inflow** of the waste water, they let it settle so that only the clear top layers of water flow into the shallow wetland.
 - In the inlets, **organic waste settles down** and is **partly decomposed** in the warm shallow water.
 - Through the **process of bioremediation**, the **organic waste** in the wetland is **converted into fish feed**.
 - There are several ecological processes at work: **soil bacteria, macro-algae, plant bacteria and plants** themselves convert nitrate, and absorb phosphate and heavy metals.
- The wetland cleans the **city’s wastewater in less than 20 days**. This purified nutrient-rich water is then channelled into ponds, called ‘bheries’ in local language, where algae and fish thrive.
- In short, these wetlands are Kolkata’s free sewage remediation works, a fertile aquatic garden and, most importantly, a natural flood defence for the low-lying city.

4. AGNIi Mission: Leveraging Technology and Innovation for Clean Water

Context: The Government of India has launched AGNIi Mission to facilitate **high impact, affordable, scalable, and sustainable technological solutions** to ensure provisioning of clean water for large swathes of Indian population.

Mains Paper Syllabus

General Studies 1

- Distribution of Key Natural Resources across the world

General Studies 2

- Government Policies and Interventions for Development in various sectors and Issues arising out of their Design and Implementation.

Details:

AGNIi Mission

AGNIi is **one of the nine missions** under the **Prime Minister's Science, Technology, and Innovation Advisory Council (PM-STIAC)**, working under the aegis of the **Office of the Principal Scientific Adviser (PSA)** and executed at **Invest India**, the National Investment Promotion and Facilitation Agency. It focuses on the following:

- **Bridging the Gap between Innovators and Adopters:** AGNIi partners with agencies and organisations and **understands their strategic, policy, and programmatic priorities at leadership tier**, and their operations in the field. On these lines, AGNIi formulates operational scenarios that these agencies themselves would recognise.
- **Creating a Scalable Impact:** It helps Indian technologists and innovators engage major adopters and their networks.
 - **For example**, in rural livelihood domains, **AGNIi will partner with women's Self-Help Groups** which ensures that **innovations are presented to a larger network**.
 - It helps in creating an ecosystem for **enabling impact at a wider scale with a built-in feedback mechanism**.
 - AGNIi institutional partnerships **establish channels that help to better understand community needs**, to build relevant technology use cases and to facilitate end-user adoption.
- **Empowering the Bottom of the Pyramid:** This mission aims to ensure that the poor, marginalised, etc. are engaged to the maximum possible extent as per the **guiding principle of Antyodaya**.
 - It ensures that Indian emerging technology and innovation solutions are targeted at grassroot level economic and human development outcomes.
- **Supporting the Competitiveness and Capturing the Value of Indian Technology:** AGNIi has refined its technological focus which includes **engaging Indian Innovation in the domains of artificial intelligence, quantum computing, robotics, cyber-physical systems, etc.**
 - By connecting pain-points to, and defining **operational scenarios for Indian Innovators**, this mission offers **insight into opportunities for Indian Innovation** to evolve solutions and scale.

Role of AGNI in Ensuring Clean Water Solutions:

- **Mapping Rural Pain Points: Evidence-based technology intervention** forms the core of AGNI's work. In this regard, **primary surveys, field-visits, focus group discussions (FGDs), and key informant interviews** are utilised to gauge rural pain points, technology preferences, and barriers to technology adoption.
- **Building India's Clean Water Technology Ecosystem:** AGNI extensively **interacts and collaborates with innovators and technology providers** to address India's pressing clean water challenges.
 - The clean water management ecosystem in India is consistently growing **to develop sustainable, low-cost, and cutting-edge technologies.**
 - These clean water specific technologies and innovations under the Mission are targeted towards **improving availability as well as quality of water to ease challenges faced by Indian citizens.**
- **Improving Water Availability:** Innovative technology solutions like **Atmospheric Water Generators (AWGs)** are alternatives that can help **make affordable clean water available to Indian citizens.**
 - AWGs extract water from **humid ambient air and convert the same into potable water.**
 - These are **decentralised, economical and environment friendly systems** that generate clean water through a **multi-stage filtration process** and then mineralise the same before dispensing.
 - Recently, such solutions have been installed in public spaces such as the **Secunderabad railway station in Telangana** by the Indian Railways and schools in Uttarakhand **to ensure availability of improved quality water.**
 - Moreover, leveraging technology and innovations for **restoration of water bodies is another sustainable method for improving water availability.**
 - Such innovations **utilise artificial intelligence based electromagnetic mapping technology** that enables them to predict the presence of perennial water sources with high accuracy and **develop the source within 100-120 days.**
- **Improving Water Quality:** In the context of improving the quality of water, innovative technology solutions can be broadly classified into two categories:
 - **Filtration solutions:** The Indian innovation ecosystem provides various sustainable water filtration and membrane-based cost-effective technologies for treating water. For example, **CSIR- Indian Institute of Toxicology Research, Lucknow** has developed **Oneer**, an innovative water technology that eliminates pathogens to provide safe drinking water to communities as per national and international standards prescribed for potable water.
 - **Monitoring solutions:** Water monitoring systems **essentially utilise sophisticated tools such as IoT** that enables **low-cost, low-power, and real time monitoring of water quantity and quality.**
 - Additionally, **advanced sensors, and data analytics systems** also help in efficient monitoring of drinking water quality in a **cost-effective manner.**
 - Platform solutions also address water monitoring concerns by generating information such as **groundwater levels, quality and quantity, and calculating daily water footprints among other things.**

Collaboration for Clean Water:

AGNI collaborates with various stakeholders such as **non-profit organisations, government departments, ministries, and corporates** to fulfil India's clean water needs. Some of the **major water engagements** that have been led by AGNI are as follows:

- **Quenching Eastern India's thirst:** To address the issue of **Metallic groundwater contamination in the Ganga-Brahmaputra plains** of India AGNI **collaborated with Aga Khan Foundation**, to conduct a technology scouting exercise for identification of affordable water filtration technologies.
 - AGNI recommended **water purification technologies** developed by Bhabha Atomic Research Centre (BARC) which **addressed issues related to arsenic, iron, and multi-contaminants.**

- **Strengthening Grassroots Networks:** MeitY's Common Service Centre (CSC) network with its **strong on-ground presence** can play a pivotal role in **facilitating adoption of clean water technologies** to rural remote areas of the country.
- **Partnering with Global Stakeholders:** **WaterAid**, a multinational NGO works towards empowering local communities and **ensures delivery of right innovations and technologies in pursuit of clean water** and sanitation for all.
 - In pursuance of these objectives in India, WaterAid partnered with AGNIi to organise a virtual technology showcase.

Conclusion:

The success of AGNIi mission is crucial in order to ensure clean water solutions since it is working to leverage **affordable, scalable, sustainable, and universal technology and innovation solutions** to ensure provisioning of clean water to Indian citizens in both rural and urban parts of India.

Objective Question:

1. Consider the following statements regarding AGNIi Mission launched by Office of the Principal Scientific Adviser (PSA):
 1. It is working towards bridging the gap between Innovators and Adopters of clean water technology solutions.
 2. Evidence-based technology intervention lies at the core of AGNIi Mission.Which of the statements given above is/are correct?
 - (a) 1 only
 - (b) 2 only
 - (c) Both 1 and 2
 - (d) Neither 1 nor 2

Answer: (c)

Explanation:

AGNIi is **one of the nine missions** under the **Prime Minister's Science, Technology, and Innovation Advisory Council (PM-STIAC)**, working under the aegis of the **Office of the Principal Scientific Adviser (PSA)** and executed at **Invest India**, the National Investment Promotion and Facilitation Agency.

- It aims to facilitate **high impact, affordable, scalable, and sustainable technological solutions** to ensure provisioning of clean water for large swathes of the Indian population.

Statement 1 is correct: AGNIi Mission aims to **bridge the gap between Innovators and Adopters** by partnering with agencies and organisations and **understanding their strategic, policy, and programmatic priorities at leadership tier**, and their operations in the field.

Statement 2 is correct: Evidence-based technology intervention **forms the core of AGNIi's work**. In this regard, **primary surveys, field-visits, focus group discussions (FGDs), and key informant interviews** are utilised to gauge rural pain points, technology preferences, and barriers to technology adoption.

Subjective Question:

2. Elaborate the role of AGNIi Mission in ensuring clean water solutions in India.
(10 Marks, 150 Words)

5. Keeping Water Resources Clean

Context: Clean drinking water is a necessity for the overall improvement of public health. Water, being the finite resource, **should be judiciously used** in order to accommodate the needs of a continuously rising population.

Mains Paper Syllabus

General Studies 1

- Distribution of Key Natural Resources across the world

General Studies 3

- Conservation, Environmental Pollution and Degradation, Environmental Impact Assessment.

Details:

- **About 71% of the earth's surface is covered with water.**
- For humans, water is an essential requirement and a critical resource for the maintenance of socio-ecological systems.
- India is endowed with a rich diversity of natural resources, water being one of them. But, **India's water availability varies** substantially across the regions, and over time.
- The amount of water recommended by the **United Nations** for drinking, washing, cooking and maintaining proper hygiene is a **minimum of 50 litres per person per day**.
- Considering the current environmental issues due to climate change, water scarcity is one of the major threats.
- The report on "**India's Initial National Communication to the United Nations Framework Convention on Climate Change**", published by the Ministry of Environment, Forests and Climate change, identified the **projected impacts of climate change on water resources**. Some of these impacts are discussed below.
 - Global warming, increase in sea level and melting of glaciers will adversely affect the **water balance in different parts of India** and quality of groundwater along the coastal plains.
 - Climate change is likely to **affect groundwater due to changes in precipitation and evapo-transpiration**.
 - Rising sea levels may lead to **increased saline intrusion into coastal and island aquifers**, while increased frequency and severity of floods may affect groundwater quality in alluvial aquifers.
 - Increased **rainfall intensity may lead to higher runoff** and possibly **reduced recharge**.

Government Initiatives to Address Issues Related to Water Resources:

- **National Water Mission:** It was launched as part of the **National Action Plan on Climate Change**, to ensure **integrated water resource management**, conserve water by **reducing wastage and ensure more equitable distribution** both across and within states. The five identified goals of the mission are as follows:
 - Comprehensive **water database** in the public domain and **assessment of the impact of climate change** on water resources.
 - Promotion of citizen and state **actions for water conservation, augmentation and preservation**.
 - Focused **attention on vulnerable areas** including overexploited areas.
 - Increasing **water use efficiency** by 20%.
 - Promotion of **basin-level integrated water resources management**.

- **Jal Shakti Abhiyan:** Launched in 2019, it was a **time-bound, mission mode water conservation campaign, implemented in 256 water-stressed districts of the country to make water conservation an 'Andolan' (Movement)** through extensive communication and involvement of communities. It focused on five aspects:
 - **Water conservation and rainwater harvesting**
 - **Renovation** of traditional and other water bodies
 - **Reuse** of water and **recharging** of structures
 - **Watershed development**
 - **Intensive afforestation**
- **Jal Shakti Abhiyan: Catch the Rain 2021:** This campaign was launched by the Hon'ble Prime Minister of India on **World Water Day**. It was taken up in all the districts of the country **to create and maintain appropriate Rainwater Conservation Structures, suitable to the soil strata and climatic conditions of the area.**
 - **Rainwater harvesting and water conservation:** Water conservation and rainwater harvesting included **renovation of traditional and other water bodies recharge using old bore wells, watershed development, etc.**
 - These works are taken up **in rural areas** from funds under MGNREGS or Finance Commission grants.
 - In **urban areas** the works were taken up from AMRUT and funds present with urban bodies.
 - In **forest areas** the works are taken up with CAMPA funds.
 - **Geo-tagging and making an inventory of all water bodies and Water Harvesting Structures (WHS)** in every district using remote sensing images from National Remote Sensing Agency (RSA) and GIS mapping technology.
 - **Setting up Jal Shakti Kendras:** They are to act as **resource or knowledge centres' for disseminating information related to water**, techniques for water conservation and water saving, and also provide technical guidance to local people as well as to the district administration.
 - **Intensive afforestation**
 - **Awareness generation:** National Water Mission has collaborated with NGOs, universities, and premier education institutions like IIM, IITs, etc. to spread awareness on JSA:CTR campaign.
- **Sustainable Development Goal (SDG) 6:** It focuses on the **sustainable management of water resources, wastewater and ecosystems** so as to guarantee safe drinking water and sanitation for all.
 - Further by 2030, it is also targeted to **enhance the water quality by eliminating dumping, minimising the release of hazardous chemicals, reducing the release of untreated wastewater by 50%** and encouraging **recycling** and safe **reuse** globally.
- **Jal Abhyaranya Programme:** To rejuvenate **drying mountain natural springs in the Himalayas through technology and community-based approaches** for providing water security to local communities by the year 2024 in collaboration with the state agencies.
 - These springs are the chief freshwater sources **for almost 40 million people in 58000 villages across the Himalayas** for drinking purposes as well as agriculture reasons.
 - They are also known as **prava, nola or dhara** which hold cultural significance in these regions.
 - As per a report by Niti Aayog, **nearly 50% of the perennial springs have already dried up or are turning seasonal by limiting flow** only during monsoon, directly affecting the people economically and socially.
- **Ice Stupas:** It was invented by **Sonam Wangchuck in Ladakh** which is a form of glacier grafting technique that creates artificial glaciers, used for storing winter water. The Ice Stupa melts to increase the water supply for crops during summer.

Conclusion:

Water, being a **valuable commodity** needs to be judiciously utilised. In this regard, government initiatives will not be enough, the **cooperation and collaboration among all the stakeholders** is required in order to maintain the sustainability of clean water.

Objective Question:

1. Which one among the following is **not** the goal of the National Water Mission?
 - (a) Promotion of citizen and state actions for water conservation, augmentation and preservation.
 - (b) Focused attention on vulnerable areas including overexploited areas.
 - (c) Increasing water use efficiency by 50%.
 - (d) Promotion of basin-level integrated water resources management.

Answer: (c)

Explanation:

National Water Mission was launched as part of **National Action Plan on Climate Change**, to ensure **integrated water resource management**, conserve water by **reducing wastage and ensure more equitable distribution** both across and within states.

Option (c) is correct: The five identified goals of the **National Water Mission** are as follows:

- Comprehensive water database in the public domain and assessment of the impact of climate change on water resources.
- Promotion of citizen and state actions for water conservation, augmentation and preservation.
- Focused attention on vulnerable areas including overexploited areas.
- **Increasing water use efficiency by 20%.**
- Promotion of basin-level integrated water resources management.

Hence, **increasing water use efficiency by 50% is not the goal** of the National Water Mission.

Subjective Question:

2. "Ensuring the sustainable availability of fresh water will be challenging given the potential threat of Climate Change". Analyse the statement and mention the steps taken by the Government of India to address the issue.

(10 Marks, 150 Words)

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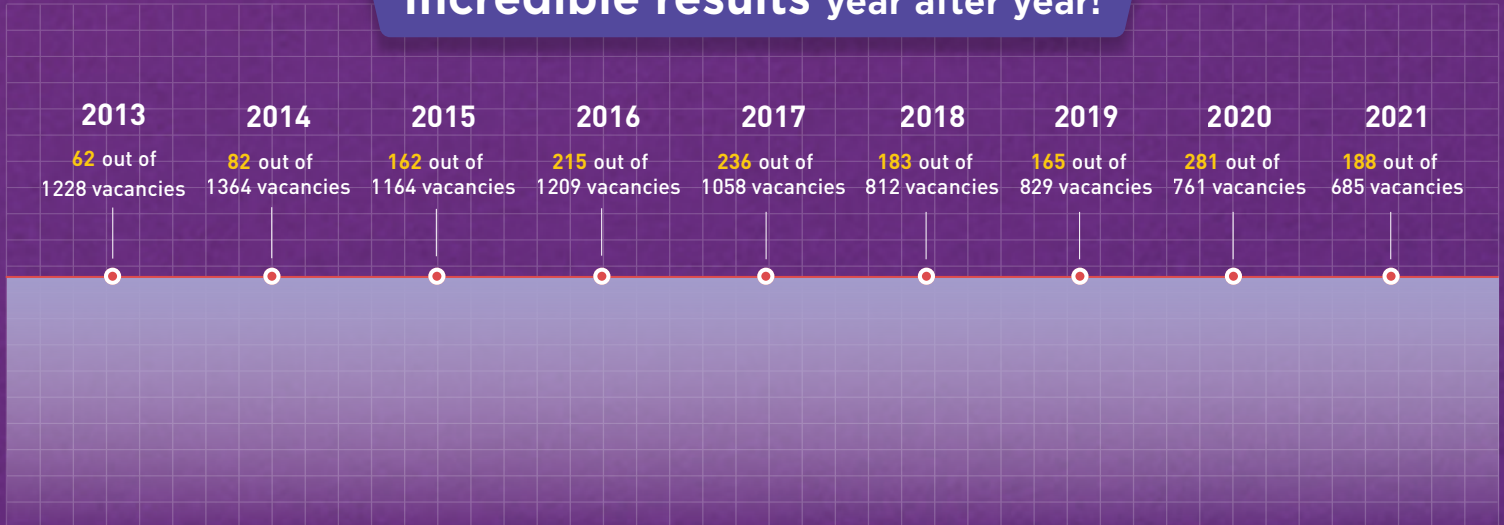


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