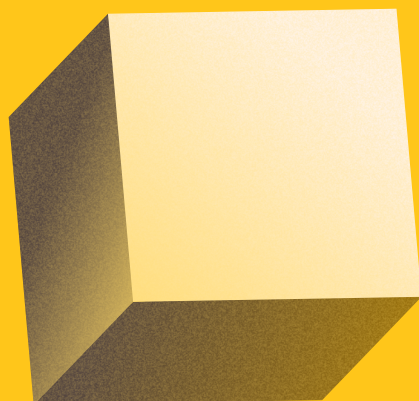


# THE HINDU ANALYSIS

**22nd March 2024**  
by saurabh pandey



Kunal Roy

Q Mixed Reality has both positive applications and challenges. Elaborate.

→ Mixed Reality is an immersive technology that combine physical and digital elements to enable them to interact with each other using 3D holograms.

Mixed reality could play a very crucial role in infrastructure, research and skill development.

Positive applications:-

(i) Healthcare sector - It could be used by doctors to practise difficult surgeries before performing the actual one to reduce fatality risks.

(ii) Education - With the spread of high speed internet, this could be used to give classroom-like experience to students in remote areas.

(iii) Architecture & Urban planning - India often faces the problem of flooding. It could be used to design cities/towns to tackle the problem of water-logging. It could also be used to design Earthquake-proof buildings.

(iv) Manufacturing industry - Every year India loses millions of dollars in the form of over production or waste materials. Mixed Reality along with AI can produce precise/accurate quantity and goods.

(v) Entertainment industry - It could give an interactive and immersive experience to the users.

(v) Defense & Security - It can be used to train our soldiers and prepare them for new kinds of dangers possible with growing technology in warfare.

Challenges :-

(i) Investment - India spent 0.8% to 2% of its GDP for research & development, which is very less compared to other countries.

(ii) Infrastructure - To reach the remotest areas, there is no available infrastructure and no proper skill/education to use such technology.

(iii) Funding to Startups - Banks are negligent to provide loans to startups who deal with such technology in the fear of becoming NPA.

(iv) Privacy & Security concerns - AI has been a major tool in breaching privacy by creating deepfakes and morphed images. Mined reality could spread it further.

(v) Absence of Regulatory framework in India is a major concern for the use of MR technology.

(vi) Integrating the existing system with MR technology and its acceptance by the people is a major problem.

Mixed reality can bridge the gap between physical and digital world and help transform our lives.

# Saurabh Pandey CSE

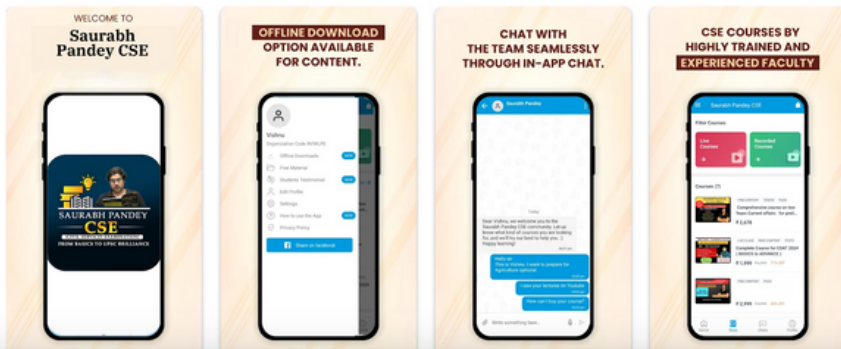
Saurabh Pandey CSE



4.8★ 73 reviews | 1K+ Downloads | Everyone

Share | Add to wishlist

You don't have any devices



App support ▾

For any query msg-  
**9057921649**

Classes on laptop-

<https://web.saurabhpandeyupsc.com/login>

Courses LIVE -(saurabh pandey cse app)  
**Must for upsc prelims 2024**

saurabhpandeyupsc.com

- Agriculture for GS
- International relation
- 2 YRS Advanced current affairs
- sci- tech
- 10 full length test

courses link in description box

Msg for any query **9057921649**



# PRELIMS TEST 25

Advanced current affairs

## LIVE

ALL Tests revision pdf  
included



Link IN description



The screenshot shows the homepage of saurabhpandeyupsc.com. At the top, there is a navigation bar with a search bar and a 'Get Started' button. Below the navigation bar, the 'Popular Courses' section is displayed, featuring four course cards. Each card includes a thumbnail image, a title, and a brief description. The courses are: 'Agriculture For General Studies', 'International Relations (Basic And Current...', 'Science And Technology For Prelims (Basic +...', and 'Comprehensive Course On Two Years Current...'. A large pink arrow points from the top of the page towards the search bar and navigation area.

← → ↻ saurabhpandeyupsc.com ☆ ⌵ 📄 🌐

SAURABH PANDEY CSE FROM BASICS TO UPSC BRILLIANCE

Categories ▾ 🔍 Search for anything...

Home Courses ▾ Pages ▾ More ▾ About UPSC Exam ▾ Current-Affairs Pointers ▾ Join Us You [Get Started](#)

## Popular Courses See More →

Prelims Module **LAUNCHED**  
Target Prelims 2024  
Basics and current affairs  
**Agriculture for General studies**  
BY Saurabh pandey sir

**Agriculture For General Studies**  
Admin  
Are you preparing for the UPSC Mains examination, and GS Paper 2 -...

Prelims Module **LAUNCHED**  
Target Prelims 2024  
Basics and current affairs  
**International Relations**  
BY Saurabh pandey sir

**International Relations ( Basic And Current...**  
Admin  
Are you preparing for the UPSC Mains examination, and GS Paper 2 -...

Prelims Module **Launched**  
Target Prelims 2024  
Course on Advance Topics of Science & technology  
Topics from last 2 yrs Special focus on Newspapers especially the hindu  
BY Saurabh pandey sir

**Science And Technology For Prelims (Basic +...**  
Admin  
Are you preparing for the UPSC Mains examination, and GS Paper 2 -...

Prelims Module **2 YRS COVERAGE ALL SUBJECTS !!**  
-POLITY  
-ECONOMY  
-GEOGRAPHY AND ENVIRONMENT  
-SCIENCE AND TECH  
-INTERNATIONAL RELATION ETC  
BY Saurabh pandey sir

**Comprehensive Course On Two Years Current...**  
Admin  
Are you preparing for the UPSC Mains examination, and GS Paper 2 -...

**saurabhpandeyupsc.com**

# Focus on prevention to preserve and protect your kidney function

World Kidney Day signals to us the importance of awareness and diligence in treatment of kidney disease. Care faces an infrastructure challenge. A total of 2,200 kidney specialists, skewed in distribution with a majority in the four southern States and metropolitan cities, leaves a critical gap in providing timely care to kidney disease patients

Georgi Abraham  
Latha A. Kumaraswami

As India faces innumerable challenges in providing healthcare to its 1.44 billion people, kidney disease is emerging as an illness to reckon with. The diversity of India especially with regard to socio economic status, literacy, food habits, cultural beliefs, and access to healthcare are all important and complex issues facing the State and central governments. A total of 2,200 kidney specialists, skewed in distribution with a majority in the four (advanced) southern States and metropolitan cities leaves a critical gap in providing timely care to kidney disease patients.

In 2019, chronic kidney disease (CKD) was responsible for over 3.1 million deaths, ranking it as the 7th leading cause of death worldwide. The global mortality attributed to all kidney diseases is estimated to range between 5 and 11 million annually, particularly impacting low and middle-income countries (LMICs). These countries are disproportionately affected by acute kidney injury and face challenges related to insufficient access to kidney replacement therapy, including transplantation and dialysis.

## Compliance with treatment

The burning issues are that people with high blood pressure, diabetes and heart disease do not comply with treatment and follow up after the diagnosis is made, which more often than not, lead to complications. Therefore it is important at this juncture to spread the message of prevention; besides addressing and evaluating the disease state periodically for the success of management strategies. Chronic Kidney Disease of unknown origin (CKDu) predominantly affecting the farming and fishing community in different geographic locations and salt pan workers calls for more research. The genetic predisposition to kidney disease is not apparent in the majority of people in India as it is different from Caucasian, Africans, Chinese and Japanese ethnic groups. A separate forum for this should be constituted and diagnosis with management strategies should be implemented.

As a renal community we, at Tanker Foundation, become aware that early-detection focussed programmes can identify large numbers of patients with undiagnosed kidney diseases, with minimal interventions, which are cost effective. We have a moral and ethical imperative to advocate for the implementation of such programmes.



Auto drivers participate in an awareness programme and screening camp on World Kidney Day conducted by TANKER foundation in Chennai. FILE PHOTO

How can we deliver our message of prevention globally. Ignorance about kidney diseases is the greatest challenge we face. Surveys have shown that less than 5% of the population knows where the kidneys are located in the body. This ignorance spills over into a reluctance to seek treatment on time, eventually leading to a preventable death.

Management strategies for Non Communicable Diseases such as diabetes, and hypertension include counselling, nutrition, medical therapy and drugs. The newer drugs for slowing down the progression of diabetic kidney disease are available in India and marketed by many pharmaceutical companies. These drugs are called as SGLT2 inhibitors such as dapagliflozin, canagliflozin, empagliflozin which also protect the heart. The RAAS blockade is an effective treatment modality with telmisartan, losartan and olmesartan. The introduction of a new drug, Finerenone, which is a mineralocorticoid receptors antagonist is useful in slowing the progression of kidney and heart diseases.

Effective blood pressure control with different group of medications to <math><130/80\text{mmHg}</math> is a very useful measure to slow down kidney disease progression and heart failure and stroke. Also exercise and appropriate food intake to reduce weight (measured as body mass index >math>22.9\text{kg/m}^2</math>). The use of alternate medications and continuous consumption of Non Steroid Anti Inflammatory drugs as painkillers and proton pump inhibitors such as pantoprazole for over 3 months are not advisable unless absolutely necessary. There is a trend of buying over the counter, the aforementioned drugs, which should be discouraged. Individuals who are working under direct heat in the open should reduce exposure to the sun



In 2019, chronic kidney disease was responsible for over 3.1 million deaths, ranking it as the 7th leading cause of death worldwide

in summer and consume salt and fluids to prevent dehydration and hence, kidney injury.

## Handheld devices

Small handheld devices estimate serum creatinine using a drop of blood in 40 seconds. By deploying these tools in the community, visits to hospitals and franchised laboratories can be avoided. Using this tool in the 30,000 odd primary health care centres in India will boost detection of kidney disease and its management through simple protocols. Though drugs are provided free of cost in government facilities, cost and supply continue to be deterrents for poorer people. 'Equity of kidney care' therefore is an appropriate slogan for (World Kidney Day) WKD 2024. It will serve to spread awareness on treatment of kidney disease caused by NCD.

Masomi Nangaku, president of the International Society of Nephrology, and Latha Kumaraswami, president of the International Federation of Kidney Foundations – World Kidney Alliance, the two organisations that lead the World Kidney Day campaign, emphasise that overcoming barriers to optimal medication practice pose multifaceted challenges: including economic burdens, limited access to affordable treatments, gaps in disease knowledge, inadequate focus on prevention and early diagnosis,

challenges in medication adherence, global policy gaps, a shortage of primary care professionals, and the harmful impact of patient misinformation. "Addressing these issues is essential to ensure fair access and promote a culture of well-informed and effective medication management," they said.

The first World Kidney Day was held on March 9, 2006 and was celebrated in 45 countries. The events held to commemorate the day include walkathons, marathons, street performance by children, adults and celebrities, screening programmes, educational seminars and media interviews. Tool kits made available to nephrologists, renal organisations and all others affiliated organisations contain suggestions for events, posters and media releases in different languages. People should be encouraged to ask "Are your kidneys ok?"

The World Kidney Day slogan in 2024 is 'Advancing Equitable Access to Care and Optimal Medication Practice'. In this mission, the kidney community world-wide including physicians, scientist, nurses, patients, other health care providers, administrators, health policy experts, Government officials, local, regional and national kidney organisations and foundations should be in the forefront to spread the message. Everyone has to be an outspoken advocate for patients to provide equity of kidney care to all. The epidemic of diabetes, hypertension, heart diseases, obesity, lack of exercise, use of alternative medications and lack of knowledge and follow up of those with prior kidney disease or family history of kidney diseases are all drivers for kidney disease and progressions.

The message of World Kidney Day is, kidney disease is common, harmful and treatable. The platform by the Ministry of Health in Tamil Nadu – *Makkalai Thedi Maruthuvam* – is a great initiative for detection of both non-communicable (NCD) and communicable disease such as Tuberculosis and other chronic infections which can have an impact on kidney functions.

With all these initiatives the future looks bright for kidney disease patients in India. The WKD will definitely accelerate the knowledge base every year and will help platform common people.

(Dr. Georgi Abraham is Founder Trustee, TANKER Foundation and Consultant Nephrologist & Transplant Physician, MGM Hospital, Chennai. email: [abraham\\_georgi@yahoo.com](mailto:abraham_georgi@yahoo.com). Latha A. Kumaraswami is Managing Trustee, TANKER Foundation and President, International Federation of Kidney Foundations- World Kidney Alliance. email: [info@tankerfoundation.org](mailto:info@tankerfoundation.org))

## THE GIST

The burning issues are that people with high blood pressure, diabetes and heart disease do not comply with treatment and follow up after the diagnosis is made, which more often than not, lead to complications. The message of prevention is therefore important

Ignorance about kidney diseases is the greatest challenge. Surveys have shown that less than 5% of the population knows where the kidneys are located in the body. This ignorance spills over into a reluctance to seek treatment on time

Small handheld devices estimate serum creatinine using a drop of blood in 40 seconds. These tools can reduce the need to visit hospitals and franchised laboratories



The hindu analysis by saurabh pandey sir



# What is CKDu??

- **CKDu or Chronic Kidney Disease of Unknown etiology/Uncertain cause is a type of chronic kidney disease that mainly affects marginalized agricultural communities in specific areas of the world where a large number of people develop an unexplained, deadly form of kidney disease**
- **Because the populations affected are some of the world's poorest and are exposed to a high degree of occupational and environmental hazards, and because the disease is considered a 'medical mystery,' CKDu has received significant attention in scientific magazines and the media**
- **Most patients affected by CKDu are males between the ages of 20 and 60 who often live in rural or agricultural settings and may be exposed to extreme working conditions. Many experience a rapid loss of kidney function**



# 'Timely treatment can limit disability in children with Juvenile Arthritis'

Serena Josephine M.

Another World Young Rheumatic Disease Day (WORD Day) went by (on March 18) with experts drawing attention to raising awareness and knowledge to help in the early diagnosis of rheumatic diseases among young people. Lack of awareness and delayed diagnosis remains a cause of concern for specialists.

Narendra Bagri, additional professor, Division of Paediatric Rheumatology, Department of Paediatrics, All India Institute of Medical Sciences, New Delhi laid emphasis on prompt diagnosis and timely treatment of Juvenile Idiopathic Arthritis (JIA) to prevent complications as well as the need to increase awareness in the community.

JIA, he said, is a broad spectrum of inflammatory arthritis encompassing various subtypes and is the most common paediatric rheumatic disorder. "The worldwide prevalence of JIA is variable, ranging from 0.07 to four per 1,000 children. There is a global variation in the distribution of various subtypes; for instance, oligoarticular JIA (fewer than four joints

are involved) is more common in the western world, while enthesitis-related arthritis characterised by pain over heels and lower back pain is the common subtype in the Indian subcontinent accounting for nearly one-third or more of cases," he said.

Though there is a lack of a national registry, given the population of the country, a sizeable number of children with arthritis suffer from JIA, he said.

## Symptoms, treatments

Children often present with joint pain and swelling with functional limitations such as limping, he said, adding: "the symptoms are more pronounced in the morning when they get up from bed or after a long period of rest. This phenomenon of morning stiffness may be reported by older children, while smaller kids may find it difficult to express. However, parents must look out for poor activity levels early in the morning, which may improve as the day passes."

Depending on the subtype of JIA, the number of joints may vary from a few to many, and accordingly, the resultant functional limitations would also va-



There is a window of opportunity early in the course of the disease, during which appropriate management improves outcomes. GETTY IMAGES

ry. For example, involvement of joints of the lower limbs (knee, ankle) and lower back (sacroiliitis) may impair walking, while wrist joint and upper limb involvement would affect writing. The temporomandibular joint (jaw joint) can lead to a difficulty in opening the mouth and eating. Delayed diagnosis and uncontrolled arthritis can leave children crippled and bedridden, Dr. Bagri said.

Apart from arthritis, these children can have other symptoms such as

pain where the ligament or tendon originate (known as enthesitis). This may manifest as heel pain. Fever, rash and redness of the eyes may be other accompanying features, depending on the subtype of JIA. Young children with JIA can also develop asymptomatic inflammation in part of the eye (uveitis), which may be vision-threatening, and these children should also be proactively screened for this complication. In addition to JIA, arthritis can also be a manifestation of other paediatric

rheumatic disorders, such as childhood lupus and juvenile dermatomyositis, which might be identified by a peculiar skin rash.

Numerous drugs are now available for the management of JIA. "Unlike in the past, the current era has challenged the therapeutic nihilism clouding the treatment of these disorders. Today, there are many effective drugs for the treatment of JIA. Broadly, the drugs used are steroids (intra-articular - injected locally in the joint or in some cases, prescribed systemically), disease-modifying antirheumatic drugs (DMARDs) or newer drugs such as biologics. As these drugs modulate the heightened immune system that causes arthritis, and may have side effects, they must be used under the close supervision of a physician, and self-prescription is a strict no," Dr. Bagri said.

## Effective drugs

There are effective drugs, including biologics/biosimilars in addition to the conventional DMARDs which are not only effective but also minimise the side effects of systemic steroids used for some of these children. "Although

effective, they are still out of reach for the common man and hence, there is a need for a collective effort to ensure their availability," he said.

Studies demonstrate that there is a window of opportunity early in the course of the disease during which appropriate management improves outcomes.

A paper has been written on factors that predict a visit to a paediatric rheumatologist within 3 months, or periodic reviews. It is titled: 'Factors impacting referral of JIA patients to a tertiary level paediatric rheumatology centre in North India: a retrospective cohort study in Paediatric Rheumatology by Manjari Agarwal et al'.

It found these factors to include: proximity to the doctor, family history of inflammatory disease, history of fever, history of acute uveitis (inflammation in the eye) or a high ESR, indicating inflammation in the body. The authors averred that cost of care and a remote treatment centre delayed consultation; acuity of complaints and family history of rheumatologic condition hastened referrals. Among their solutions would be to

increase the number of centres with paediatric rheumatologists and to improve medical insurance coverage

In addition to drugs, physiotherapy is also an integral pillar for the management of JIA.

"With effective and timely treatment, the burden of disability in these children can be curtailed to a minimum and a functionally independent adulthood can be ensured."

However, there are a number of challenges; one of the most important being the lack of awareness about these disorders in the community.

"People often are not aware of the fact that rheumatic disorders can affect kids too. Another alarming concern is delayed diagnosis as many of these children may display slow development of the disease, which may delay seeking of appropriate medical advice. Additionally, they may also be misdiagnosed under the rubric of infec-

tious arthritis. Infections are common in our settings, but the pattern of arthritis in children with JIA is usually different from infectious arthritis, such as tubercular arthritis (not every chronic arthritis is tubercular). So, it is pivotal to ascertain the cause of arthritis before initiating treatment," he elaborated.

Better awareness of JIA and its symptoms among primary care providers could help in streamlining the referral pattern of children. They should be managed by a team comprising paediatric rheumatologists, physiotherapists, ophthalmologists and other physicians.

The consequence of an untreated and prolonged illness would be a permanent disability, the extent of which would depend on the subtype of JIA.

Apart from limb-threatening complications, systemic JIA can have serious life-threatening complications as well, he said.

(serena.m@thehindu.co.in)

## For feedback and suggestions

for 'Science', please write to [science@thehindu.co.in](mailto:science@thehindu.co.in) with the subject 'Daily page'



# Rheumatic disease

- Rheumatic disease is an umbrella term that refers to arthritis and several other conditions that affect the joints, tendons, muscle, ligaments, bones, and muscles .
- It can cause inflammation, swelling, and pain in several joints at once. Other common rheumatic disease include:
- Fibromyalgia: a rheumatic disorder that affects 4 million people and causes pain all over the body (also referred to as widespread pain), sleep problems, fatigue, and often emotional and mental distress.

- **Gout**: a form of arthritis in which urate crystals build up in a joint, usually the large joint of the big toe.
- **Childhood/juvenile arthritis**: arthritis in children; the most common form is juvenile rheumatoid arthritis.
- **Lupus**: a chronic autoimmune disease that occurs when the body's immune system attacks the tissues and organs, causing damage to any part of the body.

## New capabilities

The choice of MIRV on Agni-V gives it range and ability to defeat defences

**I**n March 11, Prime Minister Narendra Modi used social media to announce India's entry into a small club of countries capable of delivering multiple nuclear warheads on a single missile. This was accomplished with the maiden flight test of Agni-V, India's longest range ballistic missile with a range of over 5,000 kilometres, with multiple independently targetable re-entry vehicle (MIRV) technology under 'Mission Divyastra' by the Defence Research and Development Organisation (DRDO). Since its first test in April 2012, Agni-V has undergone several tests and developments including canisterisation to improve its ease of handling and operation. The MIRV system's indigenous avionics systems and high accuracy sensor packages ensure that the re-entry vehicles reach the target points accurately. The DRDO said the mission accomplished the designed parameters. The test also comes five years after India's maiden anti-satellite (ASAT) test under Mission Shakti. On March 27, 2019, a live satellite in the low earth orbit of around 300 km was shot down using a modified interceptor of the Ballistic Missile Defence system.

This is a significant technological breakthrough that furthers India's nuclear weapons programme and strengthens second strike capability. This is particularly important given India's nuclear doctrine based on a no-first-use policy, credible minimum deterrence and massive retaliation in case of a first strike, which was espoused in 2003, after the nuclear tests of 1998. The choice of the MIRV on Agni-V, a three-stage solid fuelled engine, is significant as it is focused towards China given its range and multiple warheads give it the ability to defeat missile defences. India completed the nuclear triad when Mr. Modi declared in November 2018 that the country's first nuclear powered ballistic missile submarine *INS Arihant* had finished its first deterrence patrol. The MIRV is the next technological threshold in this direction and it is now only logical and a matter of time before the MIRV is deployed on submarine-launched ballistic missiles. China, which is fast expanding its nuclear arsenal, has already deployed MIRV technology – first deployed by the U.S. in 1970. Pakistan claims to have tested it as well. In this regard, the other side of this development is the factor of escalation dynamics that is going to accelerate in the region with China and Pakistan. This spiral race of one-upmanship is only going to deepen, get more technology-intensive and turn out to be an expensive endeavour as well.

The hindu analysis by  
saurabh pandey sir



# Importance OF MIRV

- furthers India's nuclear weapons programme and strengthens second strike capability.
- This is particularly important given India's nuclear doctrine based on a no-first-use policy, credible minimum deterrence and massive retaliation in case of a first strike, which was espoused in 2003, after the nuclear tests of 1998.
- The choice of the MIRV on Agni-V, a three-stage solid fuelled engine, is significant as it is focused towards China given its range and multiple warheads give it the ability to defeat missile defences.
- India completed the nuclear triad when Mr. Modi declared in November 2018 that the country's first nuclear powered ballistic missile submarine INS Arihant had finished its first deterrence patrol.



# ONE MISSILE, MANY WARHEADS

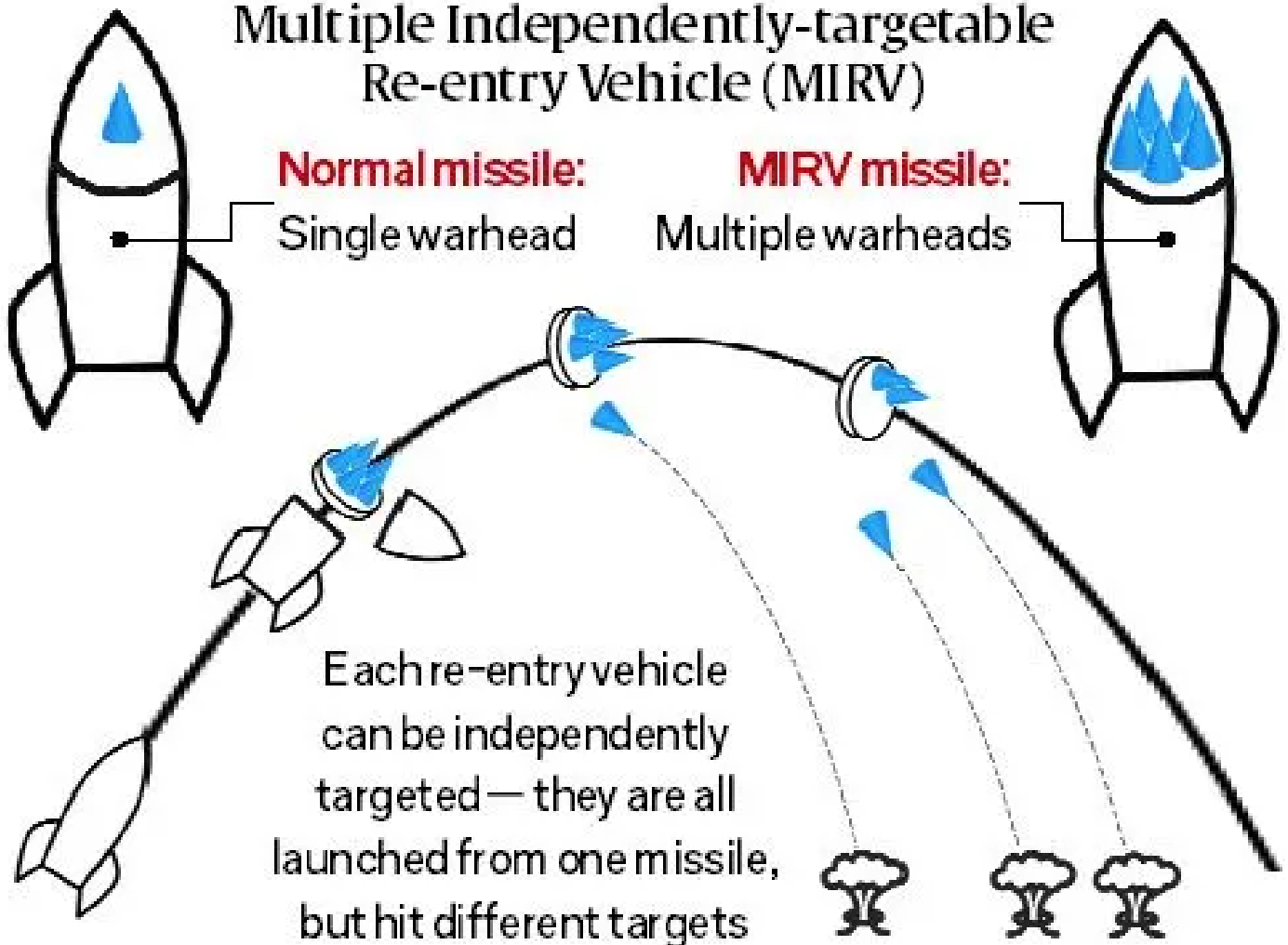
Multiple Independently-targetable  
Re-entry Vehicle (MIRV)

**Normal missile:**

Single warhead

**MIRV missile:**

Multiple warheads



Each re-entry vehicle  
can be independently  
targeted — they are all  
launched from one missile,  
but hit different targets

# India's MIRV punch

India has joined select group of nations that have Multiple Independently Targeted Re-entry Vehicle (MIRV) technology

**Agni-5** missile uses a three-stage solid fuelled engine

**5,000km** range

## USING MULTIPLE WARHEADS

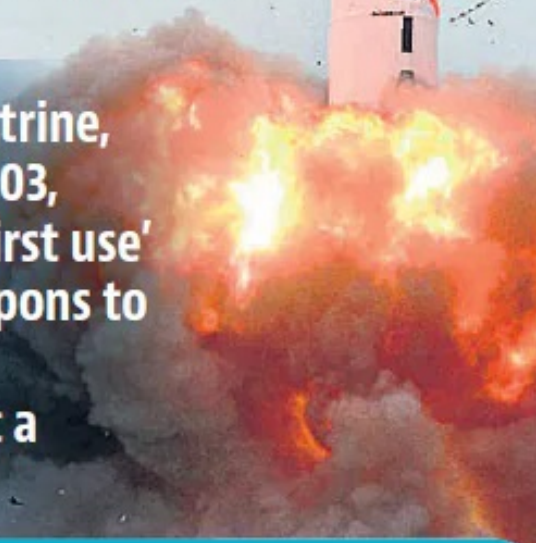
- MIRVs can cause more destruction than missiles that carry single warhead.
- It will allow Agni-V to deliver multiple nuclear warheads against different targets across hundreds of kilometres

India completed its nuclear trial in 2018 when nuclear-powered ballistic missile submarine, INS Arihant, completed its first deterrence patrol

India's nuclear doctrine, promulgated in 2003, commits to a 'no first use' posture, with weapons to be used only in retaliation against a nuclear attack

Proud of our DRDO scientists for Mission Divyastra, the first flight test of indigenously developed Agni-5 missile with Multiple Independently Targetable Re-entry Vehicle (MIRV) technology."

—NARENDRA MODI, Prime Minister





- **The MIRV is the next technological threshold in this direction and it is now only logical and a matter of time before the MIRV is deployed on submarine-launched ballistic missiles.**
- **China, which is fast expanding its nuclear arsenal, has already deployed MIRV technology – first deployed by the U.S. in 1970.**
- **Pakistan claims to have tested it as well.**
- **In this regard, the other side of this development is the factor of escalation dynamics that is going to accelerate in the region with China and Pakistan.**
- **This spiral race of one-upmanship is only going to deepen, get more technology-intensive and turn out to be an expensive endeavour as well.**



# Water, an instrument to build world peace

## WORLD WATER DAY

**W**orld Water Day, which falls on March 22, is a global initiative backed by the United Nations, and has been observed every year since 1993. Under different themes, the attempt has been to raise awareness among stakeholders about the importance of freshwater. The theme this year is "Water for Peace". As everyone knows, there was a time when clean water was available in wells, ponds, streams, rivers and other sources, but the situation is vastly different now. There is a problem of water availability with respect to quantity or quality.

### India too faces problems

This water crisis may be physical or economic based on multiple factors such as rapid urbanisation, industrialisation, unsustainable agricultural practices, climate change, erratic rainfall patterns, water overuse and inefficient water management, pollution, inadequate infrastructure, a lack of 'belongingness' among stakeholders, runoff due to high rain along with soil erosion and sedimentation. Water scarcity leads to the poor functioning of ecosystems, threatens food and water security, and, ultimately, affects peace. According to the World Resources Institute, 17 countries face 'extremely high' levels of water stress which is threatening to result in conflict, unrest and peace among people. India is not an exception to these problems. In India, water availability is already low enough to be categorised as water stressed, and is expected to reduce further to 1341m<sup>3</sup> by 2025 and 1140m<sup>3</sup> by 2050. Also, 72% of all water withdrawals are for use in agriculture, 16% by municipalities for households and services, and 12% by industries.

In almost every State and in the main cities of India, there is groundwater table depletion. The example of Bengaluru is one prominent example. In Punjab, Rajasthan, Delhi and Haryana, the ratio of groundwater consumption to availability is 172%, 137%, 137% and 133%, respectively, which is cause for alarm. In contrast, in Tamil Nadu, Uttar Pradesh, Gujarat, Madhya Pradesh and Maharashtra, it is 77%, 74%, 67%, 57%, and 53%, respectively. Most perennial rivers/streams now have intermittent flows or have run dry. In most areas after April-May, there is Less water availability even for drinking and other uses. Springs in India's hilly areas are almost dry. In



**Susama Sudhishri**

is Professor and Principal Scientist, Water Technology Centre, ICAR-Indian Agricultural Research Institute, New Delhi, and an expert in soil and water conservation engineering, watershed management, water harvesting and conservation, precision irrigation management and modelling

The theme this year is "Water for Peace", pointing to the need for better water security, sustainable agricultural production, and environmental integrity

India, the total number of water bodies is 5,56,601 whose irrigation potential covered 62,71,180 hectares. But, due to a lack of or inappropriate catchment treatment measures, bad design and poor maintenance of water bodies, most of the reservoirs/waterbodies/wetlands have silted up, resulting in reduced storage capacity and lower efficacy.

In most areas, tubewell density and networks have increased. Groundwater discharge is now more than groundwater recharge. The letting out of sewerage water and other sources of grey water into water bodies and rivers is causing a deterioration in water quality. There is a lack of proper surface and groundwater management. Rainfed regions in India which comprise over 48% of land area produces nearly 45% of the gross agricultural product.

So, a large amount of India's food grains is from the rainfed region. The Prime Minister, Narendra Modi, recently laid stress on having a judicious mix of 'traditional indigenous and new technologies to improve soil health and conserve water' and pitched for the efficient use of every drop of water. Hence, paying attention to these points is important.

### The vital role of rainwater harvesting

Enhancing water availability with respect to quantity and quality and blue and green water is vital since water is more than just a basic human right. Water is also an instrument of peace-building and enhances the overall quality of life. Promoting sustainable agricultural production, ensuring water security and maintaining environmental integrity are increasingly becoming important issues. This can only be possible by adopting different resource conservation measures in general and rainwater harvesting (in-situ and ex-situ) and ensuring roof top rainwater harvesting in particular. Rain water harvesting (RWH) enables resilience against water scarcity and drought by augmenting recharge and aiding irrigation. The optimum use of surface water by large-scale RWH structures, conjunctive use with groundwater and safe reuse of waste water are the only viable solutions to boost and maintain the current level of food grain production.

The government's emphasis on 'per drop more crop', 'Gaan ka pani gaan mein', 'Khet ka pani khet mein', 'Har Medh per ped' under various programmes such as the Pradhan Mantri Krishi Sinchayee Yojana (PMKSY), watershed

management, Mission Amrit Sarovar and the Jal Shakti Abhiyan programmes. There is an emphasis on water conservation and rainwater harvesting, rejuvenation of waterbodies/tanks/wetlands, recharge of borewell and other recharge structures, watershed development and intensive afforestation. But there is the need for a protocol of the revival of ponds/waterbodies (it is unavailable right now). To tackle all these problems there is a great need to study the condition of every waterbody, its water availability, water quality and the state of ecosystem services it supports. (This writer has done some of these in Mewat, Haryana, NCT of Delhi and Odisha.) There is a need also to create more waterbodies and their revival in every village by looking into the catchment-storage-command area of each waterbody.

### Additional steps

There is a need also for these additional interventions to ensure 'water for peace': monitoring the groundwater table; the reclamation of the water quality of groundwater, rivers and waterbodies; the pricing of water use; having a circular water economy; ensuring efficient irrigation techniques such as integrating water resources with micro-irrigations systems and IOT based automation; having integrated water resource management; installing water meters to reduce water use for domestic purposes; no free electricity, having a convergence and linkages of line departments; fostering community awareness and peoples' participation, awareness campaigns about water conservation; ensuring groundwater use neutrality; land neutrality, growing low water requirement crops; optimal crop plan having integrated farming system models; building resilience against climate change and ensuring the needs of a growing population by adopting an integrated and inclusive approach to manage water which is a finite resource; reducing losses from water distribution systems, and ensuring safe wastewater reuse, desalination and appropriate water allocation, tubewell/borewell development and finally, enabling the integration and collaboration of research, industry and academia to implement different developed and new technologies.

With these solutions, the theme of World Water Day 2024 can be strengthened and India can become water secure. These are also steps to ensure a more peaceful world.



- **water crisis may be physical or economic based on multiple factors such as rapid urbanisation, industrialisation, unsustainable agricultural practices, climate change, erratic rainfall patterns, water overuse and inefficient water management, pollution, inadequate infrastructure, a lack of ‘belongingness’ among stakeholders, runoff due to high rain along with soil erosion and sedimentation.**
- **Water scarcity leads to the poor functioning of ecosystems, threatens food and water security, and, ultimately, affects peace. According to the World Resources Institute, 17 countries face ‘extremely high’ levels of water stress which is threatening to result in conflict, unrest and peace among people. India is not an exception to these problems.**

- **In India, water availability is already low enough to be categorised as water stressed, and is expected to reduce further to 1341m<sup>3</sup> by 2025 and 1140m<sup>3</sup> by 2050.**
- **Also, 72% of all water withdrawals are for use in agriculture, 16% by municipalities for households and services, and 12% by industries. In almost every State and in the main cities of India, there is groundwater table depletion**

- **In most areas after April-May, there is Less water availability even for drinking and other uses.**
- **Springs in India's hilly areas are almost dry. In India, the total number of water bodies is 5,56,601 whose irrigation potential covered 62,71,180 hectares.**
- **But, due to a lack of or inappropriate catchment treatment measures, bad design and poor maintenance of water bodies, most of the reservoirs/waterbodies/wetlands have silted up, resulting in reduced storage capacity and lower efficacy.**

**The hindu analysis by saurabh  
pandey sir**



- In most areas, tubewell density and networks have increased. Groundwater discharge is now more than groundwater recharge.
- The letting out of sewerage water and other sources of grey water into water bodies and rivers is causing a deterioration in water quality.
- There is a lack of proper surface and groundwater management.
- Rainfed regions in India which comprise over 48% of land area produces nearly 45% of the gross agricultural product. So, a large amount of India's food grains is from the rainfed region

The hindu analysis by saurabh  
pandey sir



# Steps

- Rain water harvesting (RWH) enables resilience against water scarcity and drought by augmenting recharge and aiding irrigation.
- The government's emphasis on 'per drop more crop', 'Gaon ka pani gaon mein', 'Khet ka pani khet mein', 'Har Medh per ped' under various programmes such as the Pradhan Mantri Krishi Sinchayee Yojana (PMKSY), watershed management, Mission Amrit Sarovar and the Jal Shakti Abhiyan programmes.
- There is an emphasis on water conservation and rainwater harvesting, rejuvenation of waterbodies/tanks/wetlands, recharge of borewell and other recharge structures, watershed development and intensive afforestation.
- But there is the need for a protocol of the revival of ponds/waterbodies

The hindu analysis by saurabh  
pandey sir



# Steps

- There is a need also for these additional interventions to ensure ‘water for peace’: monitoring the groundwater table; the reclamation of the water quality of groundwater, rivers and waterbodies; the pricing of water use; having a circular water economy; ensuring efficient irrigation techniques such as integrating water resources with micro-irrigations systems and IOT based automation;
- having integrated water resource management; installing water meters to reduce water use for domestic purposes; no free electricity, having a convergence and linkages of line departments; fostering community awareness and peoples’ participation, awareness campaigns about water conservation; ensuring groundwater use neutrality;

The hindu analysis by saurabh  
pandey sir



- **land neutrality, growing low water requirement crops; optimal crop plan having integrated farming system models; building resilience against climate change and ensuring the needs of a growing population by adopting an integrated and inclusive approach to manage water which is a finite resource; reducing losses from water distribution systems, and ensuring safe wastewater reuse, desalination and appropriate water allocation, tubewell/borewell development and finally, enabling the integration and collaboration of research, industry and academia to implement different developed and new technologies**

**The hindu analysis by saurabh  
pandey sir**





# Navigating the global waterscape, its challenges

## WORLD WATER DAY

**T**he global challenge for securing access to clean water persists for about two billion people and its demand keeps rising. Beyond threatening our basic individual human needs, this scarcity also poses a risk to our collective prosperity and peace.

Today, March 22, 2024, is the 31st World Water Day, with the theme, "Leveraging water for peace". Under the 'World Water Assessment Programme', UNESCO led the development of the 2024 edition of the flagship United Nations World Water Development Report, "Water for Prosperity and Peace" as a part of UN Water (an interagency coordination mechanism on water and sanitation of 35 UN entities along with 48 other international partners).

Throughout history, water has been a pivotal resource for some of the greatest civilisations such as those that arose around the Indus, the Nile, the Tigris and the Euphrates. But it is also true that in these civilisations, conflicts arose on account of this resource, like the well documented tensions between the Mesopotamian cities of Lagash and Umma. This conflict, one of the oldest known wars in human history, centered around a fertile piece of land and water resources. Notably, this historical episode also yielded what is considered the world's first peace treaty, the Treaty of Mesilim, recognised as one of humanity's oldest legal documents.

### Water diplomacy in a time of extremities

Today, the world is also experiencing countless meteorological extremities: from intense heat waves to turbulent floods, magnifying concerns about the climate crisis as well as its continuing implications over water insecurity. For example, here in India, the monsoon has become erratic over the years and brings with it major uncertainties for agriculture, which lies at the heart of India's \$3 trillion economy.



**Tim Curtis**

is the Director of UNESCO New Delhi Regional Office for South Asia and UNESCO Representative to India (UNESCO New Delhi is part of Team UN in India)

In the context of climate change-related pressures, the world also needs to foster improved cooperation over water-sharing

Within the added climate change-related pressures we face, the world needs to foster improved cooperation over water-sharing and embrace universal principles for International Water Law. By governing the use of shared waters and encouraging the use of water sustainably, we can strive for better water diplomacy – making water a force for peace.

The shared recognition that water is a vital resource, with limitations in quality and availability, necessitates collaborative governance to ensure effective and equitable water allocation among nations, fostering regional stability and peace, and an understanding of the intricate relationships between water, climate, and international stability.

Water diplomacy also requires inclusive approaches, acknowledging the indigenous and local communities' extensive cross-border networks, as well as involving civil society and academic networks, who can also play an important role in facilitating political processes to prevent, mitigate, and resolve water-related disputes.

This year's report also highlights a general shortage of water quality data globally and points more specifically to a prominent urban-rural divide, finding that "four out of five people lacking at least basic drinking water services live in rural areas".

### Addressing rural India's needs

Within India, a total of 70% of the rural population relies on water to run their households, where agriculture remains the principal source of livelihood. This is even more striking as we know that agriculture also accounts for 70% of the total freshwater use, globally.

With improved water accessibility, these differences can be erased, and increased water investments in the rural areas have the potential for returning positive outcomes – in health, education and employment, not to mention basic human needs and dignity.

In the agrarian sector, the efficient use of

emerging artificial intelligence (AI) technology in the conservation of water, ranging from tackling crop and food loss, to minimising chemicals and fertilizers, and saving water, is starting to show that outputs that are both productive and sustainable can be enabled.

### The issue of transboundary waters

The report reminds us that a "large proportion of the world's freshwater resources are in transboundary waters" including in India. With its expansive landmass, India boasts a network of long rivers, not only serving its own needs but also shared with its neighbours. And, yet, in the South Asian region, the extent of water pollution has worsened considerably in recent years, especially the Meghna, Brahmaputra, Ganga and Indus, warns the 2024 report.

To solve these problems, the world needs a sophisticated form of cross-border water governance, promoting effective and equitable water allocation among nations that share water resources. Out of UNESCO's 194 member-states and 12 associate members, 153 countries can be classified as water-sharing nations, and all transboundary waters account for 60% of the world's freshwater flows.

Of these 153 countries, just 24 have managed to reach a 100% cooperation agreement on their shared waters, as per a 2021 UNESCO progress report on Sustainable Development Goal indicator 6.5.2 titled "Progress on transboundary water cooperation."

Since time immemorial, we have of course made significant progress in fostering peace; however, if freshwater runs scarce, it threatens our collective well-being and peace. This is also crucial for the 2030 Agenda and achieving the SDGs. Through transboundary cooperation on the sustainable management of water, we can realise benefits across various sectors including health, food and energy security, protection from natural disasters, education, improved living standards, employment, economic development, and numerous ecosystem services.



- **March 22, 2024, is the 31st World Water Day, with the theme, “Leveraging water for peace”.**
- **Under the ‘World Water Assessment Programme’, UNESCO led the development of the 2024 edition of the flagship United Nations World Water Development Report, “Water for Prosperity and Peace” as a part of UN Water (an interagency coordination mechanism on water and sanitation of 35 UN entities along with 48 other international partners)**

**The hindu analysis by saurabh  
pandey sir**



# **Water diplomacy in a time of extremities**

- **Today, the world is also experiencing countless meteorological extremities: from intense heat waves to turbulent □floods, magnifying concerns about the climate crisis as well as its continuing implications over water insecurity.**
- **For example, here in India, the monsoon has become erratic over the years and brings with it major uncertainties for agriculture, which lies at the heart of India's \$3 trillion economy.**
- **Within the added climate change-related pressures we face, the world needs to foster improved cooperation over water-sharing and embrace universal principles for International Water Law.**

**The hindu analysis by saurabh  
pandey sir**



- **By governing the use of shared waters and encouraging the use of water sustainably, we can strive for better water diplomacy – making water a force for peace.**
- **The shared recognition that water is a vital resource, with limitations in quality and availability, necessitates collaborative governance to ensure effective and equitable water allocation among nations, fostering regional stability and peace, and an understanding of the intricate relationships between water, climate, and international stability.**
- **Water diplomacy also requires inclusive approaches, acknowledging the indigenous and local communities’ extensive cross-border networks, as well as involving civil society and academic networks, who can also play an important role in facilitating political processes to prevent, mitigate, and resolve water-related dispute**

- **With its expansive landmass, India boasts a network of long rivers, not only serving its own needs but also shared with its neighbours.**
- **And, yet, in the South Asian region, the extent of water pollution has worsened considerably in recent years, especially the Meghna, Brahmaputra, Ganga and Indus, warns the 2024 report.**
- **To solve these problems, the world needs a sophisticated form of cross-border water governance, promoting effective and equitable water allocation among nations that share water resources.**
- **Out of UNESCO's 194 member-states and 12 associate members, 153 countries can be classified as water-sharing nations, and all transboundary waters account for 60% of the world's freshwater flows**

**The hindu analysis by saurabh  
pandey sir**



Courses LIVE -(saurabh pandey cse app)  
**Must for upsc prelims 2024**

saurabhpandeyupsc.com

- Agriculture for GS
- International relation
- 2 YRS Advanced current affairs
- sci- tech
- 10 full length test

courses link in description box

Msg for any query **9057921649**



# PRELIMS TEST 25

Advanced current affairs

## LIVE

ALL Tests revision pdf  
included



Link IN description



saurabhpandeyupsc.com

Google Play Games Apps Movies & TV Books Kids

# Saurabh Pandey CSE

Saurabh Pandey CSE

4.8★  
73 reviews

1K+  
Downloads

Everyone

Share Add to wishlist

You don't have any devices

App support

For any query msg-  
**9057921649**

Classes on laptop-

<https://web.saurabhpandeyupsc.com/login>



# Target Mains 2024

**Q "Water diplomacy is way forward in maintaining relationship between countries in the era of Anthropocene"**

**Discuss**

**प्रश्न "एंथ्रोपोसीन के युग में देशों के बीच संबंध बनाए रखने में जल कूटनीति काफी आगे है" चर्चा करें**

**SEND ANSWER- SAURABH PANDEY**

**UPSC Telegram channel**

**For any query msg- 9057921649**

**mail-**

**saurabhpandey456321@gmail.com**



**LINK IN DESCRIPTION**

# **International Relations**

**LAUNCHED**

**Target Prelims 2024**

**Basics and current affairs**

**International**  
**Relations**

**BY Saurabh pandey sir**



# Agriculture for GS

LAUNCHED

Target Prelims 2024

Basics and current affairs

Agriculture for  
General studies

BY Saurabh pandey sir



## Basic and advance Topics

Launched

Target Prelims 2024

Course on Advance  
Topics of Science &  
technology

Topics from last 2 yrs  
Special focus on  
Newspapers especially  
the hindu



BY Saurabh pandey sir



## International Relations

LAUNCHED

Target Prelims 2024

Basics and current affairs

International  
Relations

BY Saurabh pandey sir



Link in description

# How to watch classes ??

1- Download Saurabh  
pandey cse app

2- visit

[web.saurabhpandeyupsc.com](http://web.saurabhpandeyupsc.com)

For any query msg-  
9057921649

# **Courses Active**

**Prelims test series on advanced  
current affairs (total 50 tests)Saurabh  
Pandey UPSC: Home ( Every Thursday  
and saturday)**

**visit [saurabhpandeyupsc.com](http://saurabhpandeyupsc.com)**

**For any query msg- 9057921649**

**mail-**

**[saurabhpandey456321@gmail.com](mailto:saurabhpandey456321@gmail.com)**

# HOW TO JOIN??

1

3

2

saurabhpandeyupsc.com

How to join???

For any query msg- 9057921649  
mail-  
saurabhpandey456321@gmail.com