

UPSC CURRENT AFFAIRS NOTES 11-04-2024

National Investment and Infrastructure Fund Limited (NIIFL)

The National Investment and Infrastructure Fund Ltd. (NIIF) has invested \$200 million in iBUS Network and Infrastructure Pvt Ltd., a connectivity technology firm, to support the growth of India's digital infrastructure.



Establishment and Objectives:

NIIFL is a government-owned company aimed at maintaining infrastructure investment funds for both international and Indian investors, anchored by the Government of India.

Its objective is to catalyze capital into the country and support growth needs across various sectors.

Creation and Initial Funding:

Announced in the Union Budget of 2015-16 by Finance Minister Arun Jaitley.



Initially proposed to be established with an inflow of ₹20,000 crore from the Government of India, with their commitment being 49% of the total corpus.

Registered with SEBI as a Category II Alternative Investment Fund after its first governing council meeting in December 2015.

Leadership:

Governing Council: Chaired by the Finance Minister of India, currently Nirmala Sitharaman, and comprises members from corporate bodies, investments, and policy sectors.

Board of Directors: Oversees the business strategy and affairs of the organization. Sujoy Bose serves as the Managing Director and CEO.

Funds Managed by NIIFL:

Master Fund: Infrastructure fund primarily investing in operating assets in core sectors such as roads, ports, airports, etc.

Fund of Funds: Invests in funds managed by managers with good track records, spanning various sectors including green energy, social infrastructure, and technology.

Strategic Opportunities Fund: Invests in growth equity and aims to build domestic leaders in strategic sectors.

Alternative Investment Funds (AIFs)

AIFs represent a distinct investment category separate from conventional instruments, typically attracting institutions and High Net Worth Individuals (HNIs) due to substantial investment requirements.

Regulatory Framework: Governed by the SEBI (Alternative Investment Funds) Regulations, 2012, AIFs can be structured as companies, Limited Liability Partnerships (LLPs), trusts, etc.

Categories of AIFs:

Category 1:

Venture Capital Fund (VCF): Targets SMEs and start-ups with high growth potential, offering vital financing during their nascent stages.

Angel Funds: Invest in budding start-ups, providing early-stage management expertise. Minimum investment per angel investor is Rs 25 lakh.



Infrastructure Funds: Focus on infrastructure development companies like railway and port construction firms.

Social Venture Funds: Invest in socially responsible businesses, combining philanthropy with the potential for decent returns.

Category 2:

Private Equity Funds: Invest in unlisted private companies, typically with a lock-in period of 4 to 7 years.

Debt Funds: Primarily invest in debt securities of unlisted companies with high growth potential but low credit ratings.

Fund of Funds: Invest in various other AIFs rather than holding an investment portfolio.

Category 3:

Private Investment in Public Equity Fund (PIPE): Invest in shares of publicly traded companies at discounted prices.

Hedge Funds: Pool money from accredited investors, employing aggressive strategies across domestic and international markets.

Eligibility and Regulations:

Open to Resident Indians, NRIs, and foreign nationals with a minimum investment of Rs. 1 crore for investors and Rs. 25 lakh for directors, employees, and fund managers.

Minimum lock-in period of three years with a cap of 1000 investors per scheme (except for angel funds, which can have up to 49 investors).

Benefits of AIF Investments:

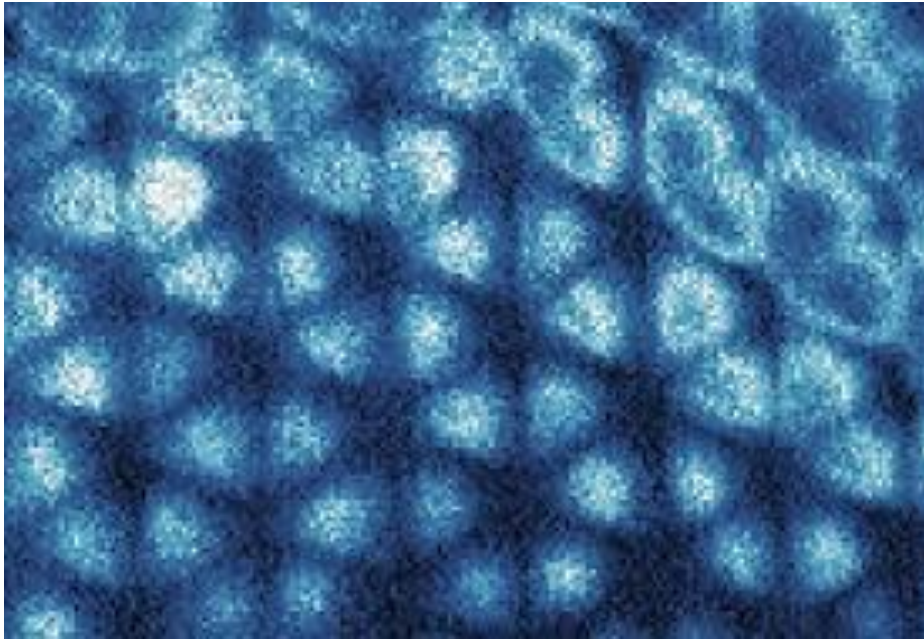
High Return Potential: Offers higher return potential compared to traditional options due to flexible strategies.

Low Volatility: Exhibits less volatility, providing stability amidst market fluctuations.

Diversification: Allows for portfolio diversification, serving as a hedge during financial crises.

WIGNER CRYSTAL

The discovery of a triangular Wigner crystal, made purely from the repulsive nature of electrons, represents a significant advancement in our understanding of quantum phenomena.



Physicists at Princeton University used a scanning tunneling microscope (STM) to directly image the Wigner crystal for the first time.

Phase Transition: By tuning the electron density, researchers observed a phase transition where electrons spontaneously formed into a triangular Wigner crystal.

Stability: Contrary to previous assumptions, the Wigner crystal was found to be stable over a wide range, with its lattice constant continuously tunable.

Quantum Nature: The observed blurring of electron positions indicated strong zero-point motion, reflecting the quantum nature of the Wigner crystal.

Significance of the Discovery

Advancing Fundamental Physics: Direct visualization of the Wigner crystal confirms its existence and provides insights into collective electron behaviors.



Potential Technological Applications: Understanding quantum phases of matter could lead to advancements in quantum computing and other technologies

About Wigner Crystal

The Wigner crystal is a unique form of matter composed entirely of electrons arranged in a crystal-like formation due to their mutual repulsion.

Named after Eugene Wigner, who proposed its existence in 1934.

Formation and Conditions:

Coulomb Repulsion: Electrons repel each other due to their negative charge, leading to potential energy minimizing configurations.

Low Density: Typically occurs in low-density systems where electron-electron interactions dominate.

Low Temperatures: Formation favored at low temperatures where thermal energy is insufficient to disrupt the ordering.

Properties of Wigner Crystals:

Long-Range Order: Electrons arrange themselves in a regular lattice structure.

Reduced Mobility: Electrons are confined to lattice sites, reducing their mobility compared to a fluid state.

Quantum Effects: Quantum mechanics play a significant role, especially at low temperatures and small length scales.

Applications:

Quantum Computing: Understanding the behavior of Wigner crystals could provide insights into developing quantum computing architectures.

Low-Dimensional Physics: Offers insights into the behavior of electrons in low-dimensional systems, relevant for nanotechnology and materials science.

Fundamental Physics: Studying Wigner crystals helps elucidate the interplay between classical and quantum physics in many-body systems.

About Quantum Crystal

Quantum crystals are materials where quantum effects dominate the behavior of particles within the crystal lattice.



Quantum Effects: These effects can include quantum tunneling, zero-point energy, and quantum entanglement, among others.

Properties: Quantum crystals often exhibit unusual properties such as superfluidity, superconductivity, and non-classical behavior at macroscopic scales.

Types of Quantum Crystals:

Bose-Einstein Condensates (BECs): Ultra-cold gases of bosonic particles that condense into a single quantum state.

Rydberg Crystals: Atoms in highly excited Rydberg states form a crystalline structure due to long-range interactions.

Exciton Crystals: Crystals formed by excitons, bound electron-hole pairs, with strong quantum coupling.

Supersolid Helium: Helium cooled to extremely low temperatures where it behaves as both a superfluid and a solid simultaneously.

Other Potential Quantum Crystal Candidates: Theoretical predictions suggest the existence of other types of quantum crystals, but experimental verification is ongoing.

Properties of Quantum Crystals:

Superfluidity: Some quantum crystals, like supersolid helium, exhibit frictionless flow, characteristic of superfluids.

Superconductivity: Certain quantum crystals demonstrate zero electrical resistance at low temperatures, enabling efficient electrical conduction.

Quantum Entanglement: Particles within quantum crystals may become entangled, displaying correlations that defy classical explanations.

Quantum Tunneling: Particles tunnel through energy barriers, leading to unconventional transport properties.

Zero-Point Energy: Even at absolute zero temperature, quantum crystals possess residual energy due to Heisenberg's uncertainty principle.

Applications:

Quantum Computing: Quantum crystals may offer insights into designing novel quantum computing architectures and materials.



Quantum Sensing: Utilizing the unique properties of quantum crystals for ultra-sensitive sensors and detectors.

Quantum Information Processing: Harnessing quantum entanglement and tunneling for secure communication and information processing.

Materials Science: Exploring the potential for new materials with tailored quantum properties for various technological applications.

IMF's Views on Industrial Policy Initiatives

Recent industrial policy initiatives by the US, Europe, and other nations aim to drive innovation but are not guaranteed solutions for economic growth, according to the International Monetary Fund (IMF).

While industrial policy can foster innovation if implemented effectively, historical examples highlight risks such as policy errors, high fiscal costs, and negative consequences for other countries.

Overreliance on subsidies and tax breaks may pose fiscal risks, favor special interests, and lead to resource misallocation.

Discriminatory policies against foreign firms could provoke retaliation and exacerbate economic divisions.

IMF Recommendations:

Advocates for a broader policy mix to support innovation, including increased public funding for fundamental research, R&D grants for startups, and inclusive tax incentives for applied innovation.

Suggests that boosting public spending on fundamental research could significantly enhance GDP and reduce debt-to-GDP ratios for advanced economies.

Examples Cited:

Highlights recent industrial initiatives like US funding for domestic research and semiconductor manufacturing, EU's support for climate neutrality transition, and measures in Japan, South Korea, and China.

World Cybercrime Index

Following three years of intensive research, an international team of researchers has compiled the first ever 'World Cybercrime Index'



About World Cybercrime Index

It identifies the globe's major cybercrime hotspots by ranking the most significant sources of cybercrime at a national level.

It has been developed as a joint partnership between the University of Oxford and UNSW Canberra.



The data that underpins the index was gathered through a survey of 92 leading cybercrime experts from around the world who are involved in cybercrime intelligence gathering and investigations.

It ranks roughly 100 countries and identifies key hotspots according to various categories of cybercrime, including ransomware, credit card theft, and scams.

Key Findings:

It shows that the threat of cybercrime is not evenly distributed worldwide.

A relatively small number of countries house the greatest cybercriminal threat.

Russia tops the list, followed by Ukraine, China, the USA, Nigeria, and Romania.

97 countries were named by at least one expert as being a hub for a particular category.

India captured the number 10 spot in the rankings.

The researchers also found that certain kinds of cybercrime were associated with particular countries. For example, the United States was associated with data and identity theft, while those related to technical products or services seemed to often originate from China.

It is estimated that cybercrime costs the world around \$9.22 trillion in 2024, and this is expected to grow to \$13.82 trillion in 2028.

Ransomware

Ransomware is malware that employs encryption to hold a victim's information at ransom. A user or organization's critical data is encrypted so that they cannot access files, databases, or applications. A ransom is then demanded to provide access. Ransomware is often designed to spread across a network and target database and file servers, and can thus quickly paralyze an entire organization.

ZiG (Zimbabwe Gold)

Zimbabwe's adoption of a new gold-backed currency, known as ZiG (Zimbabwe Gold), represents a pivotal moment in the country's economic history.

Central bank governor John Mushayavanhu announced the introduction of ZiG, emphasizing its structured framework and market-determined exchange rate.

This move signifies a departure from previous currency systems and signals a fresh approach to monetary policy.

Currency Replacement:

The introduction of ZiG comes as a response to the depreciation of the previous Zimbabwean dollar, the RTGS, which experienced a significant loss in value.

With annual inflation reaching 55% in March, the need for a stable currency became imperative.



Transition Period:

Zimbabweans have a limited window of 21 days to exchange old, inflation-affected notes for the new ZiG currency.

While the US dollar remains legal tender and dominates transactions, the introduction of ZiG aims to offer an alternative means of exchange.

Backing by Precious Minerals:

Crucially, the new currency is backed by precious minerals, primarily gold, or foreign exchange reserves, ensuring its value and stability.



This measure is intended to prevent the currency from suffering the same fate as its predecessors.

Historical Context:

Zimbabwe's economic history, marred by hyperinflation and currency crises, has engendered a deep-seated mistrust of the central bank among the populace.

Previous currency initiatives, such as the bond note, have faltered due to overprinting and mismanagement.

Public Reaction and Economic Outlook:

Despite assurances from the central bank, public reaction to the new currency reveal has been subdued, reflecting lingering skepticism and concerns about government accountability.

Economist Godfrey Kanyenze highlights the importance of fiscal discipline in ensuring the currency's success.

Challenges Amidst Drought:

The announcement of the new currency coincides with the country's struggle with a severe drought, which has devastated maize crops, exacerbating existing economic woes.

This underscores the multifaceted challenges facing Zimbabwe's economy.

KALA AZAR

India has successfully achieved its target to eliminate visceral leishmaniasis, commonly known as kala-azar, according to data from the National Centre for Vector Borne Diseases Control (NCVBDC).

This achievement comes after persistent efforts and government interventions over the years.

As per the WHO, in 2020, India accounted for 18 per cent of the global burden of kala-azar.

Kala-azar, a vector-borne disease, has posed a significant health challenge for decades, particularly in states like Bihar, Jharkhand, West Bengal, and Uttar Pradesh.



Background

Kala-Azar: Visceral leishmaniasis, commonly known as kala-azar, is a chronic and potentially fatal disease caused by the **protozoan parasite Leishmania donovani**. It is transmitted through the bites of infected sandflies.

Target Extension: Initially aimed to eliminate kala-azar by 2010, the target was extended until 2023 due to persistent challenges in disease control.

Achievement

Reduction in Cases: In 2023, India reported only 520 cases of kala-azar across the country. This significant reduction in cases is a testament to the effectiveness of various control measures implemented to combat the disease.

Additionally, there were 286 cases of post-kala azar dermal leishmaniasis (PKDL).

Elimination Criteria: India met the elimination criteria set by the World Health Organization (WHO), which defines elimination as no block in the country reporting more than one case per 10,000 people.

Government Interventions and Strategies

Indoor Residual Spraying: Rigorous indoor residual spraying efforts have been conducted to curb sandfly breeding sites and reduce disease transmission.

Sealing Breeding Sites: Measures such as sealing potential breeding sites and using special soil to seal crevices in mud walls have been employed to prevent sandflies from nesting.

Treatment Compliance: Mobilization of healthcare workers, including the ASHA network, has ensured proper treatment completion for Post Kala-azar dermal leishmaniasis (PKDL) patients, who require a 12-week course of Miltefosine.

Challenges

Persistent Challenges: While significant progress has been made, challenges persist, particularly in states like Bihar and Jharkhand, where cases of PKDL remain relatively high.



Continued Surveillance: Public health experts emphasize the importance of continued surveillance, robust healthcare infrastructure, and community engagement to prevent the resurgence of kala-azar and other vector-borne diseases.

Sustaining Progress: Sustaining the progress made is crucial for India to maintain its kala-azar-free status. Efforts to strengthen healthcare systems and improve access to diagnosis and treatment will be essential in achieving this goal.

What is Kala Azar (Visceral Leishmaniasis)?

Kala Azar is a severe and potentially fatal parasitic disease caused by Leishmania parasites.

It primarily affects the internal organs, particularly the liver, spleen, and bone marrow.

Kala Azar is transmitted to humans through the bites of infected female sandflies.

It is commonly known as Black Fever or Dumdum Fever.

In India, Leishmania donovani is the primary parasite responsible for causing this disease.

Causes:

Parasite: Kala Azar is caused by protozoan parasites of the Leishmania genus, primarily Leishmania donovani and Leishmania infantum, with Phlebotomus argentipes being the primary vector in India.

Transmission: The parasites are transmitted to humans through the bite of infected female sandflies of the genus Phlebotomus in the Old World (Africa, Asia, and Europe) and Lutzomyia in the New World (Central and South America).

Symptoms:

Fever: Persistent and irregular fever is a hallmark symptom.

Enlarged Spleen (Splénomegaly): The spleen becomes enlarged, causing abdominal discomfort and pain.



Enlarged Liver (Hepatomegaly): Liver enlargement may occur, leading to abdominal swelling and tenderness.

Weight Loss: Significant and unexplained weight loss is common.

Weakness and Fatigue: Patients often experience weakness and fatigue due to the systemic effects of the disease.

Anemia: Kala Azar can lead to severe anemia, resulting in weakness, pallor, and shortness of breath.

Bleeding Disorders: In some cases, bleeding disorders may occur due to a decrease in platelet count (thrombocytopenia).

Secondary Infections: Patients with weakened immune systems due to Kala Azar are susceptible to secondary infections.

If left untreated, it can be fatal in 95% of cases.

Diagnosis:

Clinical Evaluation: Symptoms such as prolonged fever, splenomegaly, and hepatomegaly raise suspicion for Kala Azar.

Laboratory Tests: Blood tests, bone marrow aspiration, and serological tests (such as rK39 rapid diagnostic tests) are used to confirm the diagnosis by detecting the presence of Leishmania parasites or antibodies.

Treatment:

Antimonial Drugs: Pentavalent antimonials (such as sodium stibogluconate and meglumine antimoniate) have been the mainstay of treatment for decades.

Other Medications: In regions with antimonial resistance, alternative treatments include liposomal amphotericin B, miltefosine, and paromomycin.

Combination Therapy: Combination regimens may be used for severe or relapsing cases.

Prevention:

Vector Control: Efforts to control sandfly populations and reduce human-vector contact through insecticide spraying, bed nets, and environmental management.

Reservoir Control: Controlling reservoir hosts (such as dogs) in regions where they contribute to the transmission cycle.



Early Diagnosis and Treatment: Prompt diagnosis and treatment of cases to reduce transmission and prevent complications.

Epidemiology:

Kala Azar is endemic in regions of the Indian subcontinent, East Africa, parts of Latin America, and the Mediterranean basin.

Vulnerable populations include those living in poverty, with limited access to healthcare, and in areas with poor sanitation and hygiene conditions.

Post Kala-azar Dermal Leishmaniasis (PKDL):

PKDL occurs when *Leishmania donovani* infiltrates and thrives within skin cells, leading to the formation of skin lesions.

It can emerge after treatment for Kala-Azar, but there's evidence suggesting that PKDL might occur without preceding the visceral stage. However, more research is needed to understand its development fully.