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A Shankar IAS Academy Initiative

GIST OF KURUKSHETRA

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Shankar IAS Academy™

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KURUKSHETRA MAY 2018

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1. NEW TECHNOLOGIES IN IRRIGATION SECTOR

What is the status of irrigation in India ?

- With a net irrigated area of 68.1 Mha by canals, tube wells and wells and other sources and a gross irrigated area of 95.77 Mha, India has the largest irrigated area in the world.
- Still only about 49 percent of the gross cropped area is under some degree of assured irrigation and rest of the 51 percent cropped area is dependent on the monsoon rainfall.
- largest share of irrigated area is concentrated in the north west India and presently Punjab is the only state in India which has almost 100 percent irrigated agriculture.
- Irrigation coverage in the remaining 28 states varies from a low of 5 percent to above 90 percent.
- With the advent of Green revolution, there was an urgent demand to provide timely irrigation to moisture sensitive improved dwarf varieties of rice and wheat.
- During the last decade, there has been a drastic increase in the number of deep tube wells from 14.4 lakh to 26.1 lakh.

what are the new initiatives in irrigation sector ?

- **Improved Usage of surface and ground water :**
 - Laser land levelling of fields, optimum size of basins.
 - Furrows, raised beds, conveyance pipes, underground distribution system.
 - Proper canal schedules, irrigation schedules, well maintained distribution networks.
 - Use of remote sensing, GIS sensors, drones and ICT technologies for improved irrigation.
 - Water use associations, Smartcard based community bore wells.
 - Pricing of water and power to recover their full costs, Solar pumps and allowing excess solar power to be fed back in to the grid.
- **Improved use of rainfall :**
 - In-situ, on farm and catchment water harvesting for supplemental irrigation.
 - Synchronising crop planting, transplanting with onset of monsoons.
 - Improved water retention through mulches.
 - Use of rainfall for recharge through Underground Taming of Floods for irrigation.
- **Reducing non beneficial uses and water quality deterioration :**
 - Improved canopy architecture through agronomy and plant breeding.



- Zero and minimum tillage to reduce evaporation.
- Enhanced use of micro irrigation techniques.
- Use of plastic and residue mulches and boundary plantations.
- Peri - urban agriculture and safe use of waste water.
- **Improving crop yields and water productivity:**
- Improve incentives structures for water efficient crops through price and procurement policies.
- Direct input subsidies to all farmers and let farmers decide which crops they want to grow.
- Breeding of superior crop varieties with higher yield, stress and disease tolerance
- Precision irrigation : synchronising water application and water demand.
- Soil fertility management - rotation, tillage, targeted application of nutrients.
- Disease, pest and weed management.
- Of the total farmer households, only 27 percent has the access to formal credit.
- **What are the various measures taken by GOI to promote financial inclusion ?**
- **Self Help Group Bank Linkage Programme (SHG BLP)**, the pioneering initiative of Financial Inclusion by NABARD completed 25 years during this year and is well poised to deliver the savings and credit services at the doorstep of rural poor especially women through their self-managed institutions called SHGs.
- Since its pilot stage in 1992, the SHG Programme has come a long way in covering more than 10 crore rural families.
- As on 31st March, 2017 these groups had savings of more than Rs 16,000 crore in banks and double of that amount in their internal lending.
- **Pradhan Mantri Jan Dhan Yojana (PMJDY)**, has been one of the most vital initiatives towards financial inclusion in India till date.
- Our scale of ambition in undertaking this project in a Mission Mode was much higher than any other initiatives taken in the past.
- PMJDY has been instrumental in bringing almost all families of the country into the formal financial system and enabling citizens at

2. FINANCIAL INCLUSION THROUGH TECHNOLOGY

What is the ground reality of Financial Inclusion in India ?

- Despite the passage of 70 years of independence the unbanked population is 19 percent in total.
- Approximately 51.4 percent farmer households are financially excluded.



grassroots level to perform financial transactions and keep their hard earned money safe.

- At present more than 17.5 crore bank accounts have been opened under Pradhan Mantri Jan Dhan Yojana (PMJDY) and the people have deposited more than Rs.22,000 crore in these accounts.
- The outlets of **Business Correspondent Agents /Bank Mitras** in both rural and urban areas are fully equipped with the infrastructure required for delivery of banking services like account opening, cash deposit ,withdrawal, fund transfer (Remittances).
- They also provide the insurance and pension related services.
- These services are delivered through biometric authentication and using Rupay ATM/ Debit cards swiping with PINs.
- The Business Correspondent Agents/Bank Mitras are also playing a major role in spread of financial literacy by educating the people about banking services and meeting their banking needs.
- **RuPAY Kisan Cards** have been providing impetus to cashless transactions among farming community.
- NABARD has extended support to Co.Op banks and RRBs in procuring EMV chip based RuPAY Kisan cards.
- The impetus of Financial Inclusion given by PMJDY has made it possible to flood the hinterlands with RuPAY cards.
- The **Technology based Aadhaar Program** is likely to be the biggest disruptor in financial inclusion delivery, as innovations leveraging the Aadhaar card are expected to assist in broad basing the access and acceptance by financially excluded segments.
- **Payment banks** are a new model of banks conceptualized by RBI.
- The main function of these banks is to widen the spread of payment and financial services to small business, low income households, migrant labor workforce in secured technology driven environment in remote areas of our country.
- The two schemes, namely **Lucky Grahak Yojana for Consumers and Digi-Dhan Vyapar Yojana** for Merchants were launched to nudge people towards significantly higher usage of digital transactions through the offer of incentives.
- The Lucky Grahak Yojana and the Digi-Dhan Vyapar Yojana offered cash awards to consumers and merchants who utilized digital payment instruments for personal consumption expenditures.
- The scheme specially focused on bringing the poor, lower middle class



and small businesses into the digital payment fold.

3. ROLE OF ICTS IN RURAL DEVELOPMENT

What are the potential roles and applications of ICTs for rural development ?

- **Management of Programmes :**
- Availability of the real time information of various projects help the central and state Government agencies to effectively plan, implement and monitor execution at the ground level.
- Web / Mobile based application can be deployed to keep track on fund flow, disbursement of benefits to beneficiaries, to mobilize / aware rural masses, to keep track on physical / financial progress.
- **For e-Governance :**
- Through ICTs, all Government services can be accessible to common man in his locality, through common service delivery outlets.
- ICTs can help to provide common services like land registration, birth/death/caste certificates, pension and insurance, ration card, Aadhaar enrollment etc., under a single roof.
- **Agri extension services :**
- FM, community radio, mobile telephony, soil sensors and testing devices are most compelling for making smart farmers.

- Various ICT based systems including touch screen kiosks, online agri clinics, mass/social media etc., can deliver useful information to farmers regarding crop care, animal husbandry, e-trading of produce, fertilizer and feed stock, weather forecasting, seed sources and market prices.

For Climate change and Natural resources Management :

- Using ICTs, climatology and agronomics, latest information on weather / climate change can be given to farmers.
- ICTs can handle massive data produced at different spatio-temporal scales by various sensors observing earth/environment in order to extract useful climate change information and patterns.
- Further, for natural resources, ICTs like RS, GIS etc., can be applied for scientific planning, management and monitoring.
- **For Health :**
- ICTs can offer specialized applications for rural areas including doctor database, visualization of medical reports, geographical disease pattern, hospital MIS and disease data analysis.
- Tele Medicine services can provide access to professional doctors irrespective of geographical location.



- Moreover, mobile/web applications can help to broadcast health messages on hand washing, prenatal and delivery care, immunization and nutrition, family planning etc.,
- **In Disaster Management :**
- The advent of high resolution geographical data, RS and GIS can offer greater capabilities for ICTs based disaster management applications during earthquakes, floods, oil spills, landslides, fires etc., in rural areas especially for remote locations.
- **For Education :**
- With the launch of online courses and availability of e-study material of most of the education boards and universities, rural people also have an opportunity to avail best educational facilities regardless of geographical distance and limited financial resources.
- Availability of the online education content will help the rural youth to fulfill their educational needs and enhance their capability to compete with the outside world.

What are the challenges of ICT in rural development ?

The limited supply of electricity restrains rural areas to fully utilize ICTs applications especially at village level.

Literacy rate is considerably low in rural areas as compare to urban areas and it acts

as a stumbling block to each and every awareness programmes.

At village level, few digitally literate professional are available and lack of skilled workforce to penetrate these technologies are absent is a major concern.

The ICTs based applications need uninterrupted services of telecommunication and internet whereas in rural areas where reach of mobile telephony along with internet is still not up to the mark.

The content creation must be addressed altogether in different manner to have the balance between rural and urban context.

Apart from other factors, user acceptance of ICTs applications in the rural areas is a major challenge.

In the era of digital world, personal privacy, data security, copyright infringement, computer crimes, cyber crimes etc., are also coming in front as major concerns.

4. SPACE TECHNOLOGY FOR RURAL DEVELOPMENT

What are the applications of space technologies in rural development ?

- A web based application named Srishti enables the monitoring and evaluation of IWMP Watersheds using satellite remote sensing and sample field data.
- GOI is implementing activities realigned to water conservation based on ridge to valley principles and has made role of remote sensing, GIS and GPS technologies central to their



planning, implementing and monitoring.

- Geo-MGNREGA, developed by ISRO is a geo information enabled web service/portal that assists the planning and management of activities of MGNREGA ranging from support functions to the delivery of work to the end users.
- MGNREGA is monitored through Bhuvan Geoportal involving geotagging of completed assets through Smartphone applications across the country.
- A dedicated Bhuvan portal was also developed for the Agricultural produce mapping, in which the assets are geotagged which are used for the easy maintenance of the land records, crop mapping, pesticide usage, etc.,.
- Facilities are made using Geo informatics in rural road projects to assess the conditions and vehicular traffic of the rural roads.
- Wasteland mapping is also started and an inventory was created for the better utilisation of wastelands and to prevent the land degradation and encroachment.
- Space based information is being utilised for support decentralised planning by empowering the local bodies to prepare developmental plans.
- Crop Insurance Decision Support System (CIDSS) - A web based

integrated package for implementing Pradhan Mantri Fasal Bima Yojana.

- **What are the benefits of Geo Spatial Solutions ?**

- Enhanced ease of governance with improved monitoring and evaluation for integrated development activity.
- The Geo Spatial solutions are transparent and efficient compared to traditional approach with manual surveys in the field.
- Linking management information system to geo spatial visualisation.
- Comprehensive planning and development at local level as it provides an opportunity to spatially analyze the impact of having assets by combining the data from multiple projects.
- Also aids in qualifying the need for having an asset at particular location and knowing if there is any damage caused to the assets due to human or natural causes.

- **What is Bhuvan portal ?**

- ISRO's Geo-portal, Bhuvan is providing visualisation services and Earth observation data to users in public domain.
- Besides, the portal also services several users for their remote sensing application needs.
- The Government agencies use this platform to share and host their data as per their requirements, enabling specific applications of their choice.



- The crowd sourcing services are very popular for field data collection of various government programmes.
- As per the recent direction from the Government on the most effective use of space technology by user ministries, more than 20 ministry portals are unveiled and have been discussed during the National meet on the use of space technologies, chaired by Hon'ble Prime minister of India.
- Many of the Ministries/Departments have linked their web portals to Bhuvan for online services.
- Bhuvan has become a popular platform that hosts one of the largest repositories of GIS map and services in the country.
- Bhuvan is also acting as a clearinghouse for satellite data and value added products.
- The information in Bhuvan Portal can be effectively used for scientific studies and help students, researchers and organisations to take up the scientific projects for applied research. 3.6 lakh products have been downloaded by users in the last three years and the NRSC Open EO Data Archive, as clearing house, has become widely popular.
- In India about 234 million tonnes of surplus biomass with a potential of Rs One lakh crores fossil fuel import replacement has been estimated.
- Burning of crop residues , cow dung cakes, exhaust of vehicles and methane emission from the cow dung causes the air pollution and also contributes to the GHG emissions.
- Besides air pollution the farmers also lose the soil microbes due to the heat generated during the bio mass burning and hence it affects the productivity of the crops.
- By-products of organic manures or slurry maintains soil health, its fertility, productivity and profitability of the farmers.
- Crop residues, industrial and other wastes have vast potentials of creating market for the wastes, provide rural employment, enhance income of farmers and reduce pollution.

What are the clean energy technologies available?

First Generation Bio fuels :

- In simple terms, first-generation bio fuels are those which are made from feed stocks that can also be consumed as human food.
- Whether it is sugar, starch, or vegetable oil, all of them are also human food products which makes them a first-generation fuel.
- The feed stocks that typically top this list for first-generation fuels include

5. GENERATING CLEAN ENERGY FROM WASTE

What is the need to generate energy from waste ?



food crops like corn, sugarcane, sugar beet, wheat and sorghum.

- Since they are easily extracted using conventional technology, they are also known as "conventional bio fuels."
- **Second Generation Bio fuels** - Like first-generation fuels, second-generation fuels are also produced from sustainable feedstock but, in this case, these feed stocks are not normally used for human consumption.
- That is, no second-generation feedstock is also a food crop, though certain food crops may become second-generation fuels if and when they're no longer useful for consumption.
- Second-generation non-food feed stocks include woody crops and agricultural residues or waste, which are a little more difficult to extract.
- For this reason, advanced conversion technologies are needed in the process, which is also why second-generation bio fuels are known as "advanced bio fuels."
- **Crop residues as fuel :**
- Crop residues which includes vast quantities of paddy and other straw but they have low calorific value so they have to be densified and bricketing for fuelling the steam boilers for power generation.
- As compared to uncontrolled and incomplete burning by farmers in the

field, there is a complete combustion in the boilers with relatively lesser air pollution potentials.

- This technology also does not produce any organic manure to maintain health of soil, its fertility, productivity and farmers profitability.
- **Advanced Technology :**
- Bio gas needs further purification by removing carbon dioxide and Hydrogen Sulphide for arriving the BIS standards compressed CNG for vehicular purposes.
- Advanced technologies are in the pipeline even to convert Carbon dioxide to methane which has a relatively high calorific value and is better in terms of externalities when compared to imported fossil CNG.
- **Convergence, coordination, co-generation and co-placement :**
- Rice straw with high carbon content is a difficult feed stock and mixing it with low carbon and relatively high nitrogen animal dung, food wastes, spoiled potatoes, activated sewage sludge, wastes of milk and fruit processing plants increases the overall productivity of both bio methane and CNG gas.
- This will lead to sustainable benign healthy India and generate employment, income, goods, services and pollution free environment.