

Challenges & Future of Agriculture in India



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Agriculture - India

- India ranks second worldwide – farm output
 - About 43% geographical area occupied by agricultural sector
 - 67% of population – rural areas
 - 58% rural workers – agriculture
 - Small farmers & agricultural laborers dominate
 - Labor force – 501 million (2020) - 98% (460 m) - unorg. sector
 - 41.19% in unorganized sector – Agriculture
 - Agriculture in Indian economy – contributes to 16% of GDP
- But share of workers is about 55%



Issues & Challenges in Agricultural Sector - India

- Large unorganized sector workforce under agriculture
- Difficulty in implementation of existing legislation & OSH Policy
- Lack of awareness, training & proper tools / equipment
- Infrastructure & farming systems to be improved
- Lack of OSH services in rural areas
- Unrecognized & unreported occupational illness
- Primary health centers not equipped to handle OHS issues
- Statutory controls & enforcement are with different departments



Migration of Agricultural Workers & Child Labour

- Migration of workers & their families – different regions / harvesting seasons
- Social security & health care services compromised – no permanent residency - nr
- Leads to children dropping out from school - different locations
- Exacerbates problem of Child labour - forced to work in fields for economic necessity
- 40.34 million working children & adolescents - 62 % Boys, 38 % Girls
- 60 % working children are in Agriculture – 2nd most hazardous occupation



Agrarian change - India

- Green Revolution in India – adopted in late 1960s
- To increase production of food – growing population
- Chemical agricultural practises increased –
Use of pesticides / chemical fertilizers
- Agricultural enterprises & also small farms used –
High strength pesticides & fertilizers – to increase productivity
- Health & safety – precautions were less / not observed
- Highly hazardous pesticides affect – Farm workers, their families (w & c)
Environment & health of people in surrounding areas – polluting food & water
- Pesticides issue – Occupational Health & Public Health issue



Pesticides – Issues

- Farmers not aware of the grave consequences – women, children & bystanders are exposed apart from the persons who do the spraying
- Protective clothing (mask, shoes) – not used
- Recommended dilution of pesticides not followed
- Concentration increased or decreased as per their assessment of pests
- Not used as per specification & guidelines



Innovations – Poly Oxime treated Protective Suits / Topical Gel

- Poly oxime topical gel – deactivates or neutralises organophosphate pesticides on skin – reduces inhibition of acetylcholinesterase, preventing toxicity
- Topical gel disadvantages - large quantity required to cover the exposed body, applied after each break, not cost effective, absorption from soiled clothes not prevented
- Oxime treated cotton fabric protective suit - activating fabric with nucleophilic catalyst
- Human field trials are under way



Source : Tata Institute of Fundamental Research, Instem

Electronic pest control equipment

- Solar powered AI pest control technology equipment
- Good results and wide acceptance
- Used in certain farms / orchards



Source: Microbiz Network Indi

Hydroponic Farms

- Soiless farming in hydroponic system – pesticide - free produce
- Plants grow in liquid nutrient solution – mixture of essential plant nutrients in water or in moist inert materials like Rockwool and Vermiculite.
- Not dependent on erratic weather, natural water levels, and soil contamination
- Uses 95% less water than conventional farming
- Grown indoors – control over temperature and lighting schedules



Air Pollution Hazard during Harvest – Initiatives

- Stubble burning during harvest – farmers defy ban – air pollution
- Wise crop residue management initiatives / innovative solutions – good results
- Crop residue machineries - straw baler, paddy straw chopper provided at subsidized rate
- Crop residues – used to manufacture cardboard & particle board for manufacture of cartons
- Biogas units – fermenting of harvest residue to generate bio CNG (compressed natural gas)
- Bio decomposer solution spray dissolves the stem of stubble & converts it into compost



Stubble bio refinery

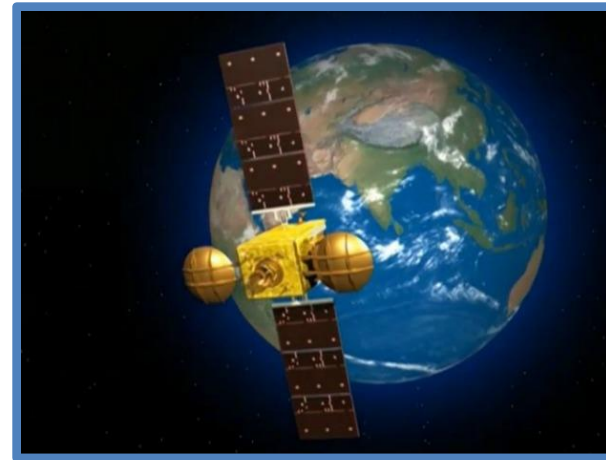
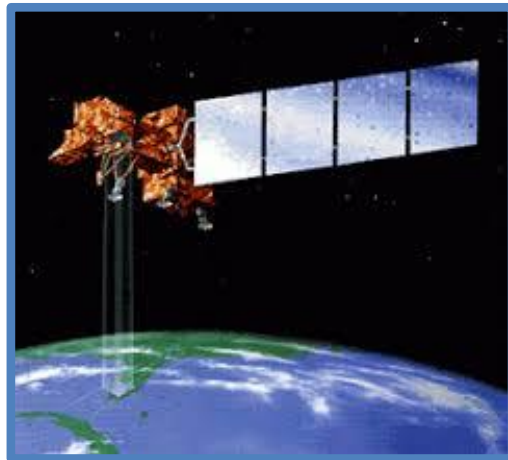
- Agricultural residue treated with chemicals, enzyme & yeast – Ethanol
- Ethanol – Blended to Petrol / Diesel
- Every 1000 kilograms of agricultural waste – 300 litres of ethanol
- About 4000 million litres ethanol annually



Source: Kasipur Biogas plant

ISRO Satellite for Agri Data

- Indian Space Research Organization, GOI – vital role
- Remote-sensing satellite technology for accurate agricultural forecast
- Satellite images for predicting crop pattern & yields
- Uses image-recognition software to monitor crops & predict farm yields
- Data-analysis platform used to predict yields of most major crops



Emergence of Agri tech Startups in India Revolutionizing Agriculture

- India - About 550 startups in agriculture technology sector
- Mentoring & Research help – Indian Council of Agricultural Research, Agriculture Universities & Agri research Institutes
Incubators & Accelerators facilities, Seed Funding & Field Testing / Trials
- Mobile App based free information on agriculture, weather, market conditions, data on crops, marketing, pest control, equipment rental services

Source: Startup Buzz, 2019



AI Technologies

- Agri data science & artificial intelligence (AI) – helping in a big way
- AI Technologies – provide solutions to farm yields
- Drones – collect & analyze farm data on crop cultivation
- Farmers can monitor crops in real time
- Provides precise analysis of the soil and crop growth
- Aerial spraying of pesticides by Drones



Roadmap to Health & Safety Initiatives – Agricultural Sector

- Awareness programs & Information / guidance in safety & health in agriculture
- Health programs in rural areas through Public-Private Partnership / NGOs / volunteers
- Health programs in rural areas – Corporate Social Responsibility activities
Companies have to spend 2% of 3-year average profit in a financial year – CSR
- Providing medical Insurance to workers in agro-cottage industries
- Preventive health screening services in the rural areas – PHCs
- Integrating BOHS with Primary Health care Centers





Home >> Divisions >> Cib Rc >> Registered Products

Related Links

- ▶ Integrated Pest Management
- ▶ Plant Quarantine + +

Registered Products

S. No.	Title	Details
1	Insecticides / Pesticides Registered under section 9(3) of the Insecticides Act, 1968 for use in the Country as on 01-04-2022	Download (387.63 KB)

Many new initiatives in Agriculture & Farmers welfare measures implemented by Govt. of India

Wishing A Happy Hans Christian Andersen Week Celebrations



Thank You