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**Report of**  
**Online Guest Lectures on**  
**Paradigm shift in 4<sup>th</sup> & 5<sup>th</sup> Generation Agriculture**

The College of Agricultural Engineering and Technology Godhra & Centre for Agricultural Market Intelligence(NAHEP-CAAST), AAU, Anand jointly organized an online seminar on “**Paradigm shift in 4<sup>th</sup> & 5<sup>th</sup> Generation Agriculture**” on 15<sup>th</sup> September 2021. About 437 participants registered for this event.

**Inaugural session:**

<b>Time</b>	<b>Session</b>	<b>Guest Speakers</b>	<b>Organizing Team</b>
10:00 to 10:15 Hrs	Inaugural Function Key note address	Dr.Gaurav Mishra, Director, SPRERI, V.V.Nagar, Anand  Dr.R.Subbaiah Prinicpal and Dean,CAET,Godhra	Dr.R.S.Pundir Dr.Y.A.Lad Dr.D.K.Vyas Er.J.Sravankumar

The event started with the introductory address by Dr.Dharmesh Vyas, Associate Professor and Head, Dept. of Renewable Energy Engineering, CAET,Godhra and Dr.Y.A.Lad, Associate Professor and CC-PI,NAHEP-CAAST,AAU,Anand highlighted the project objectives and progress so far made and the motto of organizing this seminar. He thanked Dr.K.B.Kathiria, Hon. Vice Chancellor of Anand Agricultural University for his continuous support and motivating entire team NAHEP-CAAST in all its activities. He thanked Dr.R.Subbaiah Principal and Dean, CAET,Godhra. He also thanked Dr.Gaurav Mishra guest speakers of the seminar.

Dr.R.Subbaiah, delivered his welcome address on the theme of the day. Inaugural session came to an end followed by the technical session.

**Technical Sessions:**

<b>Time</b>	<b>Topic</b>	<b>Expert</b>
10:15 to 11:15 Hrs	Role of Renewable Energy for Sustainable Development of Rural India	Dr.Gaurav Mishra, Director, SPRERI, V.V.Nagar, Anand
11:15 to 12:15 Hrs	Role of Engineering Interventions in 4 <sup>th</sup> and 5 <sup>th</sup> Generation Agriculture	Dr.R.Subbaiah Prinicpal and Dean, CAET,Godhra

Two expert lectures were organized on different aspects of renewable or green energy initiatives with cost effective approaches, challenges, opportunities for the development of rural India. Also, the technological interventions required and the growth of technology in Agricultural applications were discussed. Guest speakers with their rich experiences and knowledge presented complex data and technologies to adopt with an ease for the participants to understand. Emerging trends, challenges to be addressed in integrating the technologies, research scopes, cost effective approaches and many challenges that are yet to be addressed were focused in their talks.

At the end, Er.J.Sravankumar, Assistant Professor, Dept. of REE, CAET,Godhra & organizing member of the session proposed vote of thanks and ended session.

# Presentation Glimpses

## Guest Lecture : 01




**Dr. Gaurav Mishra**  
 Director  
 Sardar Patel Renewable Energy Research Institute  
 Vallabh Vidhyanagar

Topic : Role of Renewable Energy in Sustainable Development of Rural India  
 Time : 10:00 hrs

### Outline for Presentation

- Background
- Discussion on different sets of issues in rural India
- Renewable Energy Status and Opportunities
- Role of Entrepreneurship in Rural Development
- Introduction to SPRERI and Technology Offerings by SPRERI for Rural Development



65.97% Rural population of India (2019)

But migration of population to urban areas for better infrastructure and job opportunities is leading to urban systems which may collapse anytime due to population burden.

**SOLUTION????**

**SUSTAINABLE RURAL INDIA**

THESE ARE THE WORLD'S TOP 30 MOST POPULOUS CITIES

### Sustainable development goals of UN



GOAL 7: AFFORDABLE AND CLEAN ENERGY

WE MUST FIND WAYS TO MEET OUR ENERGY NEEDS WITHOUT HARMING THE PLANET.

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### Key Factors for Sustainable Village

- ✓ Health
- ✓ Education
- ✓ Sanitation
- ✓ Self sustained farms
- ✓ Employment opportunities

Solution → **RENEWABLE ENERGY**

Difference is clear, therefore the CHOICE is Ours

### India's renewable energy growth story

INDIAN GOVERNMENT TARGETS 175GW OF RENEWABLE ENERGY CAPACITY BY 2022

Installation trends: India's solar power installations reached 25,000 megawatts, marking a milestone in its 2022 target.

India's National Electricity Plan, 2018: Coal gets cut, renewables grow rapidly in the new plan. 600 gigawatts capacity.

India set to cross 100GW renewable energy capacity mark in 2020

### Renewable energy for rural development

#### Viable Solutions for the Agri Sector

Products available in the Agri Market:

- Solar water pumping systems
- Cold storage powered with solar energy
- Home and farm lighting products

Upcoming Products:

- Solar-powered tractors
- Solar-powered milking machines
- Mobile solar generators
- Solar power hydroponics system

How It Can Help:

- Covers over 40 lakh villages with no grid connectivity
- Escalating diesel price increases operation costs for farmers. Solar power can come to their rescue
- 30% subsidy by ministry of new and renewable energy for solar hydroponics system


The Challenges:

- Awareness among the rural folk
- Delay in subsidy disbursement
- Bulk solar cost still costlier than diesel price paid per day

### Role of Renewable Energy in Rural India

<h4>Health and Sanitation</h4> <ul style="list-style-type: none"> <li>✓ Clean cooking and improvement of indoor air environment through Biogas</li> <li>• Smokeless cookstoves</li> <li>• Solar cooker</li> <li>✓ Disposal of sanitary napkins through incinerators</li> <li>✓ MSW disposal through biogas and toilet linked biogas plants</li> </ul>	<h4>Education</h4> <ul style="list-style-type: none"> <li>✓ Continuous power supply in schools and rural households through solar PV module</li> <li>✓ Solar and biogas based cooking for midday meal preparation</li> <li>✓ Improved lighting in schools and homes through solar lamps and solar domes</li> </ul>
<h4>Societal Development</h4> <ul style="list-style-type: none"> <li>✓ Prevents migration of rural and tribal population because of better opportunities at native rural areas</li> <li>✓ Clean and affordable energy access for all</li> </ul>	<h4>Employment and Skill development</h4> <ul style="list-style-type: none"> <li>✓ MSME development for RE based products</li> <li>✓ Skill development for repair and installation of RE gadgets</li> <li>✓ Skill development for operation and maintenance of biogas plants</li> </ul>

# Guest Lecture : 02

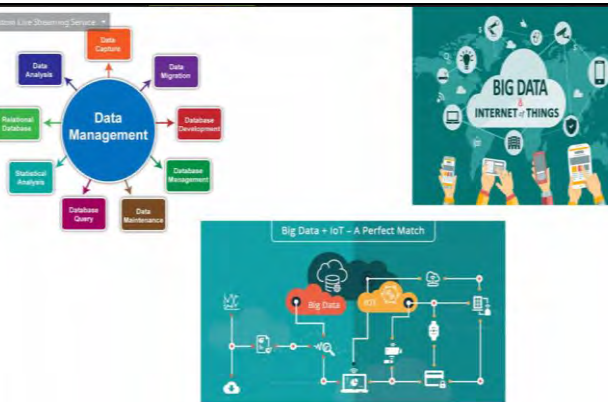
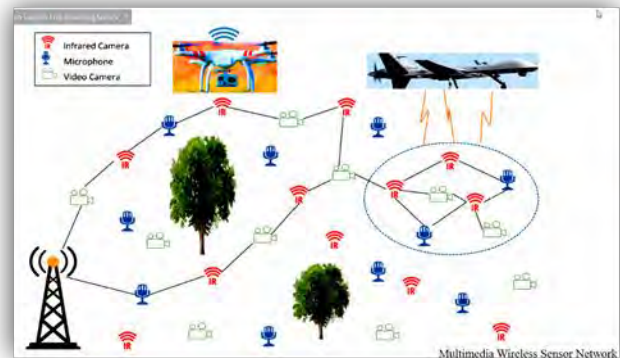
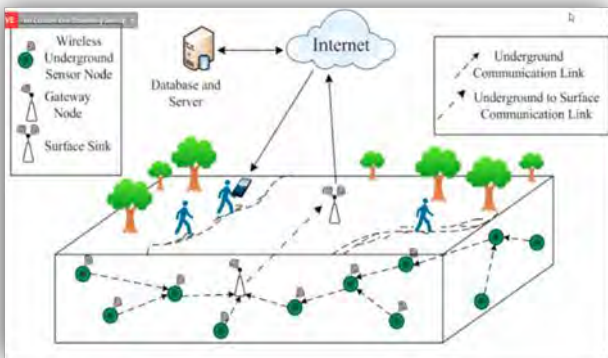
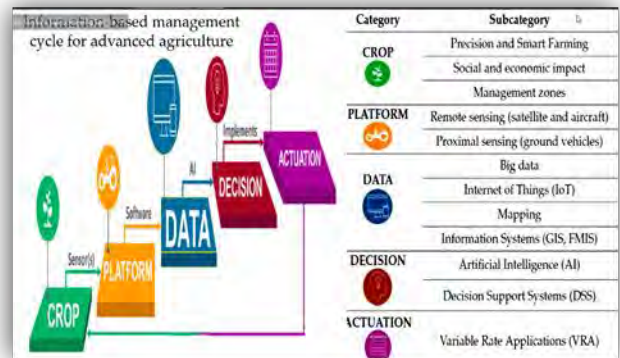


**Dr. R. Subbaiah**  
Principal and Dean  
College of AgriL Engineering & Technology  
Anand Agricultural University  
Godhra, Gujarat

Topic: Role of Engineering Interventions in 4<sup>th</sup> and 5<sup>th</sup> generation in Agriculture  
Time : 11:00 hrs

Agriculture revolution

- First wave was mechanization
- Second wave was the green revolution with its genetic modification
- Precision Agriculture technologies Which is the third wave of the modern agriculture revolution (USDA 2016)



IOT Domains

- IoT solutions in this domains were identified:
- air monitoring (34.5%),
- soil monitoring (27.3%),
- water monitoring (16.4%),
- plant monitoring (10.9%), and
- others (10.9%) which include areas such as aquaculture and animal monitoring & online crop growth monitoring
- captures different types of data pertaining to temperature, humidity, soil moisture, CO<sub>2</sub>, luminosity, pH of water, and images(10).

Paradigm shift in 4th and 5th generation of Agricultural