

NINTH ANNUAL CONVOCATION

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Convocation Address



Shri A. S. Kiran Kumar

Director
Space Application Center
ISRO, Ahmedabad



JUNAGADH AGRICULTURAL UNIVERSITY
JUNAGADH - 362 001 (GUJARAT)

Convocation Address by the Chief Guest

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Hon'ble Governor of Gujarat and Hon'ble Chancellor of Junagadh Agricultural University, Dr. Shrimati Kamla Beniwal; Shri Babubhai Bokhiriya, Hon'ble Minister of Agriculture, Co-operation, Animal Husbandry, Fisheries, Cow Breeding, Water Supply and Water Resources (except Kalpsar), Government of Gujarat; Dr. N. C. Patel, Hon'ble Vice Chancellor, Junagadh Agricultural University; Dr. K.B. Jadeja, Registrar, Junagadh Agricultural University; Vice Chancellors of various Agricultural Universities of Gujarat; Members, Board of Management; Deans of various faculties, University Officers; Members of Academic Council; invited dignitaries; faculty members, recipients of the degree being awarded by the university, students of various faculties, representatives of the media, staff of Junagadh Agricultural University, ladies and gentlemen. I am honoured and delighted to be here on this important occasion of 9th Convocation of Junagadh Agricultural University.

I congratulate the graduating students for achieving a landmark in their lives through excellent academic

performance and the faculty members for shaping the young minds to deal with the complex issues of food security in the country.

I feel it a matter of privilege and honour to deliver the address during the Convocation of this young and vibrant University of Gujarat State, the Junagadh Agricultural University. This University has great responsibilities of empowering the youth and uplifting the farming community of this region of the Gujarat State. I am sure, in the years to come it would reach greater heights in imparting high quality education in agricultural sector, undertaking the need based research and extension programmes, addressing the specific problems of the farmers in this region. This will help to enhance the farm income and livelihood status of the farming community. I would now like to refer to a few general issues relating to shaping the destiny of our agricultural system.

As you are aware, the nation is going through a difficult economic situation due to national and international economic ambience. In spite of this, India has the potential to come out of this difficult situation, because of its inherent strengths. Agriculture sector is witnessing radical changes and challenges at national and global level. The demand for agricultural commodities is steeply rising; food preferences of the next-generation consumers are changing and agriculture sector is struggling with decelerating profitability which is dragging

its performance. The emerging challenges and opportunities call for a paradigm shift in the innovation driven agricultural research system to connect inventions with all the stakeholders in the entire food supply chain. The initiatives taken by the State Agricultural Universities, ICAR and ISRO have led to notable accomplishments in natural resource management, input use efficiency, climate resilience, secondary agriculture and economic transformation of farmers through technological interventions.

Agriculture in India is the pivotal sector for ensuring food and nutritional security, sustainable development and for alleviation of poverty. It is the key sector for generating employment opportunities for the vast majority of the population. Since quite some time, agriculture sector, as a whole, has been confronted with numerous challenges linked to food and energy crisis coupled with degradation of natural resources. This sector also influences essential ecosystem services such as water and carbon sequestration

Indian agriculture contributes to 8 per cent global agricultural gross domestic product to support 18 per cent of world population on only 9 per cent of world's arable land and 2.3 per cent of geographical area. About 80 per cent of our landmass is highly vulnerable to drought, floods and cyclones. On the brighter side, India possesses substantial biodiversity - nearly 8 per cent of the

world's documented animal and plant species are found in our country. Many of these are considered crucial for livelihood security of poor and vulnerable population. Therefore, conservation of natural resources, maintenance of biological wealth and acceleration of agricultural growth are considered of paramount importance in the present context as well as of the future. The Agriculture universities should remain vigilant and responsive to the changing scenario through adoption of novel technologies and by promoting problem-solving knowledge products.

To meet the estimated requirement of about 280 million tonnes of food grains by 2020, we need to augment the domestic food production by 5 million tonnes a year. The yield levels have to leap frog to meet the burgeoning demands. Hence "bridging the yield gap movement" assumes urgency, since most holdings are small and there is a need for greater marketable surplus and cash income. The Indian food industry has witnessed strong growth over the past few years. India is the world's second largest producer of food next to China and has the potential of becoming the biggest producer in the years to come. The total food production in India is likely to double in the next ten years. With a huge agriculture sector, abundant livestock and cost competitiveness, India is fast emerging as a sourcing hub of processed food. While the country's agricultural production is significant, the food processing in

India is still in its nascent stage. Out of the country's total production of fruits and vegetables, only about two per cent is processed.

India has vast resource of livestock, poultry and fish, which play a vital role in improving the socio-economic conditions of rural masses. According to a recent report of the Department of Animal Husbandry, India ranks first in respect of buffalo, second in cattle and goats, third in sheep, fourth in ducks, fifth in chickens and sixth in camel population in the world. India has 57 per cent of the world's buffalo population.

In order to optimize and harvest the returns from livestock, dairy, poultry and fisheries sector, there is a need to focus on bridging yield gaps by enhancing productivity through appropriate investments in R&D along with promoting small holder livestock enterprises. The thrust areas for research include improvement of cattle and buffalo and conservation of indigenous breeds of livestock in their breeding tract. Increasing biomass through integrated three tier silvi-pastoral system, developing dual purpose crop varieties and introducing nutritive and drought resistant varieties of fodder crops in the common property resource lands.

Gujarat has a proud place in the Indian economy. It is one of those states of India where economy has always performed better than the national average. Rapid

economic development is often accompanied by a host of environmental problems. Gujarat has not been an exception to this. Some of the major environmental concerns in Gujarat are: i) ecosystem degradation (forest, grasslands, wetlands), ii) conservation of protected areas (national parks and sanctuaries), v) land degradation and desertification, vi) biodiversity conservation and, vii) coastal vulnerability.

Before I talk in more details on the above environmental issues, I would like to briefly touch upon the India's Space programme. India's space programme has been conceived keeping in view of the benefits to the common man and the society. Since its initiation, our space programme has touched all the facets of the society's need, be it the food, water, and the environment or mitigating the disasters or education and health or communication and infrastructures. Indigenous space technology has been extensively used in all the above sectors of the societal development.

Here, I would like to tell the development which has taken place in Earth Observation (EO) programme of our country. As mentioned earlier, India's space programme, including the EO programme has been user driven and the national development has been its motivation, India's EO programme was initiated with the launch of Bhaskara-1 satellite in 1979 and since then there has been phenomenal improvement in the EO capabilities in

terms of improved spatial, spectral and radiometric resolutions, coverage, stereo imaging as well as better image analysis techniques for product generation and information extraction.

During the past three decades, data from EO satellites has been extensively used in natural resource management, environment monitoring and disaster mitigation in our country. Some of the major sectors in which RS data have been extensively used include agriculture, forestry, water resources, land-use, urban and infrastructure planning, watershed development, environment, coastal ecosystem, marine resources and snow and glaciers. Multispectral and multi temporal RS data facilitate identification of crops, estimating their area, inferring the possible yield and hence production forecasts before harvest. Using remote sensing data pre-harvest operational forecast for five crops, wheat, rice, potato, jute, rapeseed-mustard are provided. This technology has been now institutionalized at Mahalanobis National Crop Forecast Centre (MNCFC) established by the Union Ministry of Agriculture, New Delhi. In addition, monitoring drought and its severity is being carried out using remote sensing data and monthly reports are communicated to respective states.

Another important area where space-based Earth Observation data is used in the country is weather services for agricultural applications. The high-resolution (~5 km)

short-range (upto 72 hrs) weather forecasts on air temp, RH, wind speed and direction, atmospheric pressure, rainfall, cloud fraction are available at 3-hourly interval from the MOSDAC website of ISRO (available on experimental basis). MOSDAC also provides various kinds of data products related to weather and ocean from both, Indian satellites as well as from international missions. The quality of forecasts is being further improved by INSAT-3D based land product assimilation for better advisories to farmers.

Weekly NDVI (Normalized Difference Vegetation Index) composites and week-to-week change in NDVI from INSAT 3A CCD are regularly being used by IMD (Agrimet) for preparing bulletins for national agro-met advisory service and subsequent communication to 'crop-weather watch' group. The Mahalanobis National Crop Forecasting Centre (MNCFC), New Delhi is experimentally using INSAT NDVI product for in-season assessment of rabi crop progress and national- scale drought assessment.

The network of AWS and micrometeorological stations (Agro-Met Station, AMS) use data transmission facility of INSAT for quick and regular access to high temporal weather data. These are very much useful to develop models for pests- diseases forecasts.

Fisheries is one of the important means of

livelihood for large population in the coastal areas of Gujarat, including Junagadh which has about 130 km of coastline. Fish processing is one of the major industrial activities in Junagadh district in addition to the cement and allied industries. As I mentioned earlier, data from the Indian EO satellite, Oceansat 2, are being operationally used for providing near real time information on the locations of the potential fishing zones (PFZ) to the fishermen. These information are provided to fishermen through radio broadcasting, electronic display boards and mobile phones. This has helped them in saving time, cost and efforts.

In the inland fisheries sector, scientific hydro-biological studies are required to be taken up for the majority of the reservoirs to ascertain their potentials for further development of culture based capture fisheries. Here, again I would like to emphasize the role of space technology, using which one can monitor the water quality of inland lakes and reservoirs and study sedimentation and eutrophication patterns important for inland fisheries.

Coastal zone, one of the most productive marine ecosystem, is highly vulnerable to natural and anthropogenic activities. Space based EO data has been extensively used to monitor the entire coastal zones of the country and the information are being used in implementation of Coastal Regulation Zone (CRZ)

notification as well as for providing environmental clearances by the central and state governments. Satellite data has been used to map and monitor the critical and vital coastal habitats such as coral reefs and mangroves. Monitoring from space based EO data indicates that the coral reefs in the Gulf of Kachchh are degrading. Though the mangrove cover has increased in Gujarat, at many places it has degraded. There is a need to take appropriate conservation measures to stop further degradation of these important coastal habitats.

Forest and wetlands are the other important ecosystems in Gujarat state. Junagadh district has 1608 sq km of forest (19.42% of its geographic area) which also includes Gir protected area. Gujarat has only 7.46% of forest cover (14169 sq km), out of which about 60% is open forest. Forest cover in the country is monitored once in two years by using Indian Remote Sensing Satellite (IRS) data.

Data from our Earth Observation satellites indicate that about 68% of the land of Gujarat state is undergoing land degradation. Water erosion and salinity are the major processes of degradation. At national level, 32% of the land (105.48 mha) is under degradation. I would request the university to take initiatives in this direction and also sensitize the farmers to take appropriate measures to arrest the degradation of our precious land.

Wetlands of the entire country are being monitored using IRS data. In Gujarat, 3.47 mha area is

under wetlands of different categories. It includes 2.26 mha, 0.249 mha and 0.073 mha covered by tidal mudflats, reservoirs and tanks, respectively. Wetlands are highly vulnerable to the anthropogenic activities, especially in urban areas. Appropriate conservation measures need to be taken for the wetlands as they serve important ecological functions and also provide ecosystem services to the people.

Apart from the above important environmental issues, the other area of concern is water resource. Increased exploitation has led to the depletion of ground water in many areas of the country, including Gujarat. Emphasis needs to be given to rain water harvesting for, both, recharging of ground water and also for creating surface water storage. Though there have been very good efforts in Gujarat - especially in Saurashtra - towards rain water harvesting by making a very large number of check dams, but this needs to be further strengthened. Salinity ingress in the coastal area is another area of concern. One of the major cause is the excessive withdrawal of ground water in the coastal area which leads to salinity ingress through subsurface aquifers.

Growing energy need is a serious concern for agriculture sector and also for food security. Efficient management of energy in agriculture for various operations is the key research and development

challenge. High dependence on oil and non-renewable sources of energy may make agriculture more risk-prone and less profitable. To efficiently manage energy, new sources of renewable energy need to be explored. Farm machinery that suits Indian farmers and improves efficiency of agricultural operations would be developed and promoted. Non-conventional sources of energy such as, solar, wind and wave can be viable alternatives in Gujarat as the state has been endowed with the abundance of these sources.

Gujarat government has set a good example of installing solar panels on canal top that can generate power without taking any extra space, use of natural resource without causing environmental pollution and reduce the loss of water through evaporation. It is estimated that 22000 MW energy can be generated if the whole Narmada canal is covered with solar panels. Saurashtra region is bestowed with abundant solar and wind energy that can be harnessed for the benefits of farmers. The students of the university have good opportunity to work on bio-fuel energy to make it cost effective for the benefits of the farmers.

As the Gujarat state has a very large coastal area, research and development should also be taken up for harnessing energy from ocean waves and marine algae in addition to wind. Our Oceansat 2 and RISAT-1 satellites provide data on surface winds and waves on regular basis.

Research should be targeted to develop bio-fuels without compromising on food security and by effectively utilizing huge agri-waste (animal and crop residues). A multi-pronged strategy need to be adopted to explore new biological sources of ethanol, especially from non-food stocks, develop processes for maximising ethanol extraction, explore management practices and opportunities to grow bio-fuel stocks in low-productive/waste lands. Waste lands are being mapped and monitored using space data.

The agricultural education will need to be enriched with more of practical content for enabling the students to address the concerns of stakeholders, primarily the farmers and consumers. Universities should also plan on formal and non-formal education especially in respect of knowledge and technological empowerment of vast section of workforce in rural areas. This will expand the opportunities for off- farm employment and lead to total transformation in rural areas. There is a substantial shortage in the available stock of graduates, post-graduates and doctorates in agriculture and allied disciplines. This shortage needs to be addressed on priority.

For the development of the society in general and the rural India in particular, though we need to develop and use advanced technologies, at the same time we should also take the advantage of the conventional wisdom and

methods available with the local people which has been in practice for generations. In addition, we should also encourage the innovations of the rural inventors which have been highly specific to the local needs. Many such kinds of rural innovations by the common man have been extremely useful to the farming community. I can mention with pride many of such rural innovations from Saurashtra and Gujarat, such as 'Bullet Santi', Arkhiben's invention of herbal pesticides, cotton harvester developed by Nathubhai Vadher, Mini tractor of 10 HP developed by Bhanjibhai Mathukiya from Junagadh, and so on. There are many such innovations which have touched the lives of small and poor farmers. I want to say that we need to use high-end modern technologies along with the traditional knowledge and wisdom of the local people as well as the rural innovations together to achieve the goal of the over all development of the rural area and the society which shall make our country self-reliant and finally a developed nation.

Dear friends, while wishing you all the best in life, I would like to share with you that for your generation living in an environment of stiff competition, time is most precious thing in the world. The basic idea of acquiring education should be to see beyond obtaining degrees. You should develop within yourself discipline, dedication, truthfulness, respect for others, and spirit of service to the society. I would also urge upon the learned teachers to serve

as the real inspiration for students by virtue of their own actions that combines practice with precept.

I once again congratulate the graduates on the successful completion of studies at this great institution and their parents for enabling them. I wish you happiness and professional success in your life. I also wish the Vice Chancellor of the Junagadh Agricultural University a continued success in providing the country with dedicated human resources. Let the Junagadh Agricultural University become the flagship of a national movement for reaping the benefit of youth energy and innovativeness for advancing the productivity, profitability and sustainability of small-scale farming.

Thank you.

ARISE ! AWAKE ! PERFORM !

JAI HIND