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Convocation Address

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New Delhi

Junagadh Agricultural University

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Gujarat

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by

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Hon'ble the Governorshri of Gujarat & the Chancellor of Junagadh Agricultural University, Shri Om Prakash Kohli; Hon'ble Minister of Agriculture, Rural Development, Fishries, Animal Husbandry & Transport, Shri R. C. Faldu; distinguished Hon'ble Vice-Chancellor of Junagadh Agricultural University, Dr. A.R. Pathak; Registrar, Dr. A.M. Parakhia; Hon'ble Vice-Chancellors of SAUs of Gujarat; Members of the Board of Management and Academic Council, invited guests, learned faculty members, dear students, representatives of press & media, ladies and gentlemen.

At the outset, I wish you a very happy, productive and prosperous new year 2018. And, I am grateful to the Vice Chancellor of Junagadh Agricultural University for inviting me to this auspicious function to deliver the 13th Convocation Address of this vibrant University carved out from the prestigious Gujarat Agricultural University during 2004. I congratulate all the graduates and post-graduates who have received the degrees, awards and medals today and you have my very best wishes of shaping the future of agriculture for the progress of the farming community in this great country in a manner that "Food for All and Forever" becomes a reality. With great pleasure, I wish you all the very best for a bright and fruitful career and a very happy life. This being the thirteenth convocation marks an important milestone in the history of this University and I wish many more milestones in the years to come. I also take this opportunity to extend my hearty congratulations to the faculty and staff of the University who have given their best for imparting quality education and morals to the students.

The Junagadh Agricultural University is functioning in a typical arid and semi-arid type of climate in the state. Hence, drought, erratic rainfall, low fertility and salinity ingress are the major constraints

limiting productivity and agricultural production of this region. Despite all these constraints, the University has responded most dynamically to the needs, challenges and opportunities of agriculture in Gujarat and fine-tuned its mandate, plans and programmes accordingly. Despite vagaries of monsoon and climate extremities, hardworking innovative farmers of Saurashtra resulted in good progress. The Saurashtra region is blessed with rich biodiversity of Gir forest, and *Girnar* and *Barda* hills and enjoys 865 km sea coast. Saurashtra is the home of famous breed of cattle- Gir cow, Jaffarabadi buffalo, Zalawadi goat and Kathiawadi horse. The university is known for its pioneering research in development of pearlmillet and castor hybrids. Recently, the university has registered the famous Gir Kesar mango as Geographical Indication for Gir region of Junagadh and Amreli districts.

During the last decade, Gujarat has witnessed an average agricultural growth of about 10.67 per cent as against the national average of 3.57 per cent. Nevertheless, this progress should not make us contented as the state agriculture is facing many challenges to achieve sustainable growth rate in future as well.

India has experienced remarkable growth in production of various agricultural commodities over the last five decades. Major changes in agricultural production took place in mid-1960s with introduction of new technologies. The "Green Revolution" technology initially introduced in resource endowed areas in late 1960s spread into other parts of the country during 1980s. The agriculture sector observed spectacular growth of over 4% per annum during 1980 to 1990. However, this growth rate did not continue during the last decade due to several reasons including slowdown in public investment, low yield growth, declining water table and environment led stress problems, climate changes.

We progressed on food grains production front from 51 million tonnes in 1947 to 272 million tonnes, a 5.4 times increase, besides bumper crop of pulses, sugarcane and cotton in 2017. Simultaneously, our population grew from 361 million in 1947 to 1302 million, 3.6 times, in 2017. Analogous progress is also recorded in fruits and vegetables, milk, fisheries and poultry production. All this has

made us a proud nation with self-reliant food security and a net exporter today over food-import-shipment-to-mouth situation in 50's and early 60's. While applauding this achievement, we need to be reminded that severe ups and downs in the total production and agriculture growth during this period, is more on monsoon dependent than on technology, continues to be a cause of concern. On the socio-economic front we get saddened when we say that we are at a low paddle of socio-economic development, even among developing countries, in terms of undernourishment, hunger and poverty prevailing among our population. Suffice to say that half of world's undernourished children are our own (mostly rural and farm families}, which is estimated to cost annually about 3% of our GDP. This growth cannot be called a sustainable growth.

Gujarat is emerging as a major player with highest contribution of about 40% groundnut, 35% cotton, 70% of the castor production and 22% of the marine fish to the national production bowl. The state has already established itself in the dairy sector having pioneered the milk co-operative movement which is adopted as a model by other states in the country. Today, the per capita availability of milk in Gujarat is more than 430 g/day as against the national average of around 322 g/day. The State is the largest producer of castor, cumin, fennel seeds and *Psyllium* husk in the world.

Timely availability of quality seeds to the farmers is the need of the hour. The JAU, Junagadh has given utmost importance to quality seed production of important crops. It is heartening to note that the University has set up an independent Mega Seed Unit and also infrastructural facilities at different centres. The University is also producing biofertilizers like *Rhizobium, Azotobacter* and phosphate solubilizing bacteria, and bio-pesticides like *Trichoderma* and *Beauveria* in huge quantities and supplying directly to the farmers on affordable prices.

Soils has been a constantly degraded and over-exploited natural resource that affects the production and productivity to a greater extent. As per FAO estimates, only 11% of the Earth's surface has no limits on its use for agriculture. Nearly 28% is too dry, 23% has chemical imbalances, 10% is too wet, 6% is permanently frozen and

remaining 22% is constrained by shallow depth. Similarly, organic matter in soil particularly in several tropical countries is very low. About 70% of Indian soils are deficit in organic carbon (less than 1%) and micronutrient deficiencies are being widely experienced throughout the country. Soil toxicity due to the industrial effluents and use of chemicals and pesticides is affecting adversely, both soil health and crop productivity. Ever increasing menace of land degradation and population pressure has forced the farmers to cultivate even the marginal lands. India's climatic conditions offer an ideal environment for biomass production and more than 52% of India's land is cultivable against the global average of 11% are plus points.

Water is another important vital resource for economic development. At the global level, three fourth of the earth's surface is covered with water and the total water resources amount to 138.5 million km^3 comprising 97.3% as salt water and the balance 2.7% as fresh. Of the later, 75.2% occurs in polar ice and glaciers, 22.6 per cent as ground water, 0.3% in lakes and rivers and 1.9% in soil moisture and atmospheric vapour. This indicates that very limited water is available for domestic, industrial and agricultural use. Fresh water is finite but renewable through continued hydrologic cycling. India is one of the well-endowed countries in terms of annual rainfall and has about 4% of world's fresh water resources. It is projected that the present per capita per annum water availability of 2001 m^3 will reduce to the stress level of 1700 m^3 in the next 2 to 3 decades. Further, the projected reduction in water availability to the agricultural sector from the present share of 80 to about 70% or less by 2020 would adversely affect our capacity to produce more food. Future gains in agricultural productivity of the country shall be critically examined by integrated development and utilization of surface and ground water resources. Of 400 million ha-m of surplus monsoon runoff is lost to sea and could be stored in sub-surface aquifers for augmenting the water resources. The indiscriminate use of canal water is leading to water logging and salinization in the major irrigated commands. The increased ground water extraction has declined water table at an alarming rate, putting an additional burden on farmers in terms of investments, equipments and energy etc. Further, it is estimated that even after achieving the full irrigation potential

nearly 50% of the total cultivated area will remain rain fed and important source of livelihood.

The adoption of micro-irrigation projects has resulted in water saving, yield and income enhancement at the farm level. In Gujarat state till 2016-17, a total number of 9,85,342 beneficiary farmers have adopted Micro Irrigation Systems (MIS) in a total area of 15.60 lakh ha. Out of the total area, 13.65 lakh ha has been covered under agricultural crops and 2.19 lakh ha under horticulture. The major non-horticulture crops, covered under the MIS are groundnut, cotton, sugarcane and castor, while the major horticulture crops covered under the scheme are potato, banana, mango, papaya and vegetables.

Diversification of agriculture refers to the shift from the regional dominance of one crop to regional production of a number of crops/enterprise, to meet ever increasing demand for cereals, pulses, vegetables, fruits, oilseeds, fibres, fodder and grasses, fuel, livestock and fish products, etc. It aims to improve soil health and a dynamic equilibrium of the agro-ecosystem. Crop diversification takes into account the economic returns from different value-added crops. It is different from the concept of multiple cropping or succession planting in which multiple crops are planted in succession over the course of a growing season. Moreover, it implies the use of environmental and human resources to grow a mix of crops with complementary marketing opportunities, and it implies a shifting of resources from low value crops to high value crops, usually intended for human consumption such as fruits and vegetables. With globalization of the market, crop diversification in agriculture means to increase the total crop productivity in terms of quality, quantity and monetary value under specific, diverse agro-climatic situations world-wide.

There is a need to conceptualize the integrated farming system (system diversification) to synergize productivity and profitability, input use efficiency, cropping intensity, resource conservation, employment generation, environmental security and poverty alleviation, identification, evaluation and up scaling of integrated farming systems in different agro-ecological regions. Optimal combination of agriculture, livestock, fishery, forestry etc. is essential for various categories of farmers and farming situation with a

viable basket of options.

Since organic farming addresses soil health, human health and environmental health and is eco-friendly, appears to be one of the options for sustainability. Therefore, organic farming is receiving a focused attention of Government. The Government of Gujarat declared "Gujarat Organic Farming Policy-2015" to support scientifically evolved organic farming practices for sustainable farming system along with the trustworthy marketing and supply chain of the produce. It is aimed to promote technically sound, economically viable, environmentally non- degrading, and socially acceptable use of natural resources in favour of organic agriculture.

Climate change and environmental degradation (including important natural resources *viz.*, land, water and biodiversity) is being considered as one of the greatest risk to future world food security especially in African and Asian continents including India. A degrading environment would witness degraded soils, dry aquifers, polluted waters, disappearing flora fauna and forests, rising seas, unpredictable rainfall, river floods, glaciers melt, and so on. Already, nutrient depletion in the soil, erosion, lowered water tables and salinization are wide spread phenomena. About 70% of the fresh water drawn annually is used for agriculture. With the receding rainfall as we see in the Indian sub-continent, it will be impossible to replenish the ground water withdrawal, causing water tables to fall. The excessive use of agricultural production inputs like fertilizers and pesticides by the industrial economies has further accelerated the pace of pollution of water bodies and soil, thereby causing extensive damage to habitat and species.

Climate resilient agriculture-suitable varieties, cropping system (including diversification), conservation agriculture, run-off and run-on-farming, precession agriculture, carbon sequestration are some of the R&D aspects which require greater support, beside incentive to small farmers for the adoption of such technologies and practices. Central Government initiative on "climate resilient agriculture" is a step forward in this direction and still greater policy framework is needed in context to farmers participating research & development, developing early warning systems, weather advisory services, etc.

Apart from increasing the production and productivity of agricultural produce and products, agro-biotechnological applications have a great potential in enhancing the value of agricultural products in terms of quality and nutrition. Biotechnology, in agriculture, is a powerful and immensely useful tool to keep pace with the ever burgeoning population for meeting the food and nutritional security, compensate for dwindling natural resource base and meeting the challenge of escalating biotic and abiotic stresses.

Agriculture sector now facing several challenges like growing demand for increase in production, safe and healthy food, threat from changing weather conditions, increased risk of diseases and pests to plants etc. Nanotechnology can be gainfully employed in tackling these problems by facilitating research at below molecular level. Nano-materials, nano-tools and nano-devices would become a blessing to agriculturists. Nanotechnology can revolutionize agriculture for improving the ability of plants to absorb nutrients, rapid disease detection, molecular treatment of diseases, efficiency of herbicides and pesticides, developing most efficient farm machinery, facilitate exact quantity of pesticides application, food processing and value addition etc.

Precision farming is a new form of farming approach which is the need of the hour both globally and at Indian context. For judicious use of farm inputs and improving their use efficiency towards enhancing the productivity, modern precision farming techniques need to be adopted through precise levelling of land, exact application of inputs of water, fertilizers / nutrients, chemicals etc. and related machinery and effective management of pests and diseases. The precision farming is one of the most scientific approaches for sustainable agriculture as it involves management of inputs both spatially and temporally by integrated approach of frontier technologies of remote sensing, GIS, GPS and micro-processor based variable rate application technologies resulting in very efficient agricultural production systems.

Acute labour shortage and the rising cost of agricultural production in India have brought engineering inputs to agriculture in

focus. In India more work-force is involved in agriculture, as per the survey carried out by the National Sample Survey Organization in the year 2009-10, the total employment in both organized and unorganized sector in the country was 46.5 crore. Out of this, about 43.7 crore were in the unorganized sector. Of the 43.7 crore workers in unorganized sector, 24.6 crore were employed in agriculture sector. The disproportionate to its contribution in country's GDP has led to diminishing work force in agricultural sector. Such scenario would lead to mechanization of majority of agricultural operations and hence potential would exist for skilled or semi-skilled farm workers only.

Mechanization of agriculture involves the use of different machines in farming operation right from ploughing to transportation and marketing of products. India is considered as one of the top countries in respect of agricultural production but in term of farm mechanization, it is behind the world average. For instance, the tractor intensity in India is about 16 tractors for 1000 ha land while world average is 19 tractors and that of developed countries is very high, thus, it is observed that there is significant opportunities and scope for mechanization.

The country has been witnessing considerable progress in farm mechanization. Its spread across the country still remains uneven. Current farm power availability hovers around 1.7 kW/ha which is much lower than that of Korea (7+ kW/ha), Japan (14+ kW/ha) and USA (6+ kW/ha). It is estimated that to increase farm productivity to grow more food (280 million tonnes), the farm power availability must reach at least 2.5 kW/ha by the end of year 2022. In India, so far tractor has been considered the major symbol of agricultural mechanization. Indian agriculture is dominated by small and marginal farmers, thus required steps for setting up custom hiring centres or high tech machinery bank so that small and marginal farmers can be benefited.

As in the rest of India, there has been a steady shift from animal power to electro-mechanical sources of power in Gujarat although the rate of change has been slower than that of the leading agricultural States. The availability of power is estimated at 1.20 kW/ha which is less than the average power availability in the country. About 90% of power comes from tractors, engines and motors. In Gujarat there are a

good number of manufacturers making good quality farm implements selling in our country and exporting also. There is good scope for introducing improved equipment for performing various farm operations for cultivation of rice, wheat, pulses and cotton in Gujarat.

Post-harvest losses generally range from 5 to 10 per cent for non-perishables and about 30 per cent for perishables. This loss could be and must be minimized. Let us remember, a grain saved is a grain produced. The challenge is in handling of fresh produce after harvest with emphasis on reducing losses, value addition, maintaining eating quality and marketing. Agro-processing is now regarded as the sunrise sector of the Indian economy, in view of its large potential for growth and likely socio economic impact specifically on employment and income generation. Some estimates suggest that in developed countries, up to 14 per cent of the total work force is engaged in agro-processing sector directly or indirectly. However, in India, only about 3 per cent of the work force finds employment in this sector revealing its underdeveloped state and vast untapped potential for employment. Properly developed, agro-processing sector can make India a major player at the global level for marketing and supply of processed food, feed and a wide range of other plant and animal products.

Renewable energy sources - solar, wind, and biomass are now 2nd largest sources of energy generation next to thermal power which may be the first by 2022 with 175000 MW as the goal set by the government. One side, burning of biomass in several parts of the country causing pollution problem on other side biomass and animate power could be the major sources of meeting energy needs of the rural sector, as it is available locally. The decentralized production of electricity using biomass is being attempted through the producer gas route, in addition to photovoltaic solar system for lifting water, lighting and energy for household appliances. It is estimated that more than 600 million tonnes of biomass is produced every year from various crop residues and agro-wastes of which about 50 per cent can be used for energy generation. Besides about 27 million tonnes municipal waste is also available which has potential to be utilized for energy production.

The Government of India has launched the "Make in India" programme and Hon'ble Prime Minister Shree Narendra Modi is trying

to convince the foreign industries to manufacture their products in India. In this context the emerging farm implements & machinery and irrigation technology industries in Gujarat and particularly in Saurashtra may collaborate with foreign manufactures to produce the quality products in our country. This will provide an opportunity for export of farm Implements and Machinery and Irrigation Technology from the state as well as our own farmers will also be benefited.

Entrepreneurship development in service sector in agriculture and allied sector has immense potential through engineering interventions. One such approach is skill development training in manufacture, repair, maintenance and related service support in farm machinery, irrigation, processing, energy equipment repair, maintenance and for primary processing of food grains, fruits and vegetables, etc. This is the key approach targeted at ensuring hand and mind engagement security to get productive output. Training programmes are organized regularly to empower unemployed youth, farmers, farmwomen and upcoming entrepreneurs. Some of the technologies identified are production agriculture, agribusiness in improved farm implements, setting up of household/cottage and small scale food processing unit.

Agriculture Information Technology has to play a big role in agriculture for information dissemination as farmers need information to their situation specific requirements. So far, we are adopting the traditional systems to disseminate the information to the farmers. In this system, there is a plenty of time gap in reaching the information to the farmers. The information needs to reach at right time.

Today, agriculture has achieved commercial importance and has changed from subsistence farming to commercial farming, import oriented to export oriented, supply driven technology to demand driven technology etc. New inputs and new technologies are hitting market every day. The market for processed and packaged food products is increasing day by day and therefore there is a vital need of trained manpower in this business.

Certain sectors in India such as floriculture, aquaculture, poultry, processing of fruits and vegetables are reaping the benefits of

advanced technology. The agribusiness sector encompasses the many activities of agricultural sector under one umbrella like integration of agricultural inputs, agricultural productions, agro-processing and agricultural marketing and trade which add value to the agriculture produce. Increasing integration of world food markets and the expansion of organized retail also imply that the scope of agribusiness is becoming increasingly global. The Indian food industry is poised for huge growth, increasing its contribution to world food trade every year due to its immense potential for value addition, particularly within the food processing industry. The Indian food and grocery market is the world's sixth largest, with retail contributing 70 per cent of the sales. The Indian food processing industry accounts for 32 per cent of the country's total food market, one of the largest industries in India and is ranked fifth in terms of production, consumption, export and expected growth. It contributes around 8.80 and 8.39 per cent of Gross Value Added (GVA) in Manufacturing and Agriculture, respectively, 13 per cent of India's exports and six per cent of total industrial investment.

This resulted in growth of agribusiness. Agribusiness Management has enormous potential to address key national and global challenges of inclusive growth, and food and nutritional security. Agribusiness management is therefore becoming a popular career choice for agriculture students and there is great need to develop the professional agribusiness managers who cannot only fill the management requirements of the changing agriculture scenario but also prove to be a great support to the farmers. Agribusiness education is a qualification that helps mould the personnel into good managers having managerial expertise. Looking at this Indian scenario, the public, private and cooperative organizations are looking for professionally competent and trained agribusiness managers.

The agriculture and allied sectors continues to be pivotal to the sustainable growth and development of the Indian economy. As per the new series, the Gross Value Added (GVA, earlier referred as Gross Domestic Product) at 2011-12 basic prices for the agriculture and allied sectors grew to Rs. 15.82 lakh crores in 2014-15 from Rs.15.79 lakh crores in 2013-14. The provisional estimates by the Central Statistics Office (CSO) show that more than 40 per cent of the GVA in the sector

during the first two quarters of 2015-16 was based on the livestock products, forestry and fisheries sector. Veterinary Science and Animal Husbandry is a vital component of the Agricultural Sector.

Development of the animal husbandry sector supports the livelihood of farmers by providing supplementary income, employment, draught power as well as manure for crops. There is evidence to show that farming households with some cattle head are better able to withstand distress due to extreme weather conditions. The growth and development of the dairy sector has been a major success story. With an estimated production of 146.3 million tonnes in 2014-15, India continues to be the largest producer of milk in the world. Per capita availability of milk has reached 322 grams per day during the year 2014-15, which is more than the world average of 294 grams per day. Similarly, in the case of meat, egg, wool and fish production, substantial progress has been achieved. The Annual growth rate for production of meat (6.7 million tonnes) has been observed in 2014-15. The increased demand for protein foods in the country is the main driver for such growth.

In order to give a major thrust to conservation and development of indigenous breeds in a focused and scientific manner, Rashtriya Gokul Mission is being implemented under the National Programme for Bovine Breeding and Dairy Development. The mission is implemented with the objectives of; a) developing and conserving indigenous breeds; b) undertaking breed improvement programme for indigenous cattle breeds so as to improve their genetic makeup and increase the stock; c) enhancing milk production and productivity; d) upgrading nondescript cattle by using elite indigenous breeds like Gir, Sahiwal, Rathi, Deoni, Tharparkar and Red Sindhi; e) distributing disease-free high genetic merit bulls for natural service. Central Government is also providing assistance to the State Governments for the control of animal diseases, scientific management and upgradation of genetic resources, increasing availability of nutritious feed and fodder, sustainable development of processing and marketing facilities and enhancement of production and profitability of livestock and fisheries enterprises.

Animal Husbandry sector play a significant role in supplementing family incomes and generating gainful employment in the rural sector, particularly among the landless labourers, small and marginal farmers and women, besides providing cheap nutritional food to millions of people. The animal husbandry sector not only provides essential proteins and nutritious human diet through milk, eggs, meat, etc. but also plays an important role in utilization of non-edible agricultural by-products. Livestock are the best insurance against the vagaries of nature like drought, famine and other natural calamities. Animal husbandry, dairying and fisheries sector engage 23.68 million persons in India.

The Saurashtra region is the native tract of world famous Gir cows, a most popular milch breed in India and abroad, Jaffarabadi buffaloes, known for its high fat content in milk, Zalawadi and Gohilwadi goats as well as Patanwadi, Dumba and Marwadi sheeps which are life-line for nomadic shepherd communities of these area and additionally, the Kathiyawadi horses and Asiatic lions have added proud feathers to the livestock wealth of the Saurashtra region.

Aquaculture is the fastest growing food sector in the world with an annual growth rate of over 8%. Nearby 50% of the total fish production is now contributed by the aquaculture globally and this is also becoming gradually true in India. Marine capture fishery production of Gujarat was highest on all India basis in last few decades. In comparison with the stagnant marine production and uncertainty of further production, sustainable aquaculture appears to have a bright future as a source of human food and biological production. In recent years, Gujarat has made the tremendous progress especially in terms of brackish water shrimp aquaculture with about 10,000 ha of area being under culture. Nevertheless, more efforts are required for the commercialization of brackish water and fresh water fin-fish aquaculture.

The key areas for current and future research in this sector include reproduction, nutrition, health and genetic improvement of aquatic animals. There is a need to develop suitable technology for culture of commercially important brackish water fin-fishes in coastal saline lands. Research in fish biotechnology and fish biodiversity

through development of various molecular markers, molecular techniques in fish health management, fish cell culture and fish gene banking requires prime attention. Applications of biotechnology for the enhancement of aquaculture production will relieve the pressure on some wild stocks and thus shall facilitate their confirmed survival in nature. Efforts are required to develop suitable technology for formulation of pelleted feed for Indian major carps (Catla, Rohu, Mrigal), commercialization of fresh water pearl culture technology, and effective dissemination of information about scientific fish farming practices to fish farmers. Use of satellite remote sensing and Geographic Information System (GIS) tools for development of Decision Support System (DSS) for criteria based identification and selection of the suitable brackish water aquaculture sites as well as regular monitoring of aquaculture expansion in the State also requires to be implemented.

India is among 12 mega biodiversity countries and 25 hotspots of the richest and highly endangered eco-regions of the world. In terms of marine environment, out of India's total coastline of 8100 km, Gujarat possesses 1600 km of long sea coast with a wide range of coastal ecosystems such as estuaries, lagoons, mangroves, backwaters, salt marshes, rocky coasts, sandy stretches, coral reefs and seaweed patches. The major rivers of Western River System pass through Gujarat and drain into the Arabian Sea. All these resources are characterized by unique biotic and abiotic properties and processes. However, most of them are unexplored until now. The accelerated loss of aquatic biodiversity components over the last few decades has been of great concern. Environmental changes, over exploitation, habitat loss and pollution are among the major causes of biodiversity loss.

For biodiversity management, gene and genotype frequency data through genetically controlled markers can provide information on species identification, population stock structure, hybridization and gene flow. Thus the use of biotechnology may provide avenues for reducing the impacts of farmed fish on wild population, improving the reproductive success and survival of endangered species, thereby helping to identify and conserve aquatic biodiversity. Sperm and embryo cryopreservation are important technological tools for ex-situ

conservation of indigenous and endangered species and storing their genetic material in ex-situ gene banks for future use. Genotoxicity studies involving effect of certain chemicals on gene structure may be helpful in ascertaining the potentiality of pollutants for any given aquatic species. As in case of aquaculture, satellite remote sensing and GIS tools may also help in proper management of the marine, brackish water and freshwater aquatic biodiversity database of the State with respect to different geographic locations.

Most crucial issue before us is how to continue building our human resource in order to compete globally and serve the diverse needs of society. Emerging challenges will require a new breed of scientists and managers that have excellence in the field of new sciences such as biotechnology, information technology, environmental science, Geographic Information System (GIS), space science, health and other natural sciences. The strength of an organization/system is determined not by mere numbers but by the technical competence of its human resource. Hence, HRD should be seen as a long-term investment in interest of our community. Transforming the scientific institutions into new agricultural institutes characterized by different work culture, responsiveness and cost-effectiveness is another great challenge. There is a need to build a knowledge-based system. We must use information technology as an instrument of research as well as knowledge sharing, and also to functions as virtual laboratories. Such efforts would also provide us a platform for innovative partnership both nationally and globally.

The state agricultural universities are our main source of developing competent human resources that are so critical for the development of agricultural sector. Higher Agricultural education is an important activity mandated for the ICAR. The Central Government through the ICAR provides partial financial support for enhancing the quality and relevance of higher agricultural education in the country. The support is for policy, quality assurance through accreditation, common academic regulations, updated and contemporary course curricula and delivery systems, improvement of faculty competence, promoting excellence through scholarships/fellowships, Niche areas of excellence, experiential learning, National Professors, National

Fellows, Emeritus Scientists, admissions of students through All India competitions, modernization of farms, IT support and upgradation of infrastructure and facilities including libraries. It is however, recognized that the major support comes from the respective state governments.

Dear students, remember, education is a life time process and graduation is a milestone in the journey of learning. The *Manusmrti* says that the pupil obtains one quarter of his learning from the teachers, another quarter from his own intelligence, the third quarter from association with fellow-students and the remaining quarter in course of time. Remember excellence is a journey and not a destination. One of the *Subhashita* states that even having learnt the sciences, one remains a fool unless he applies them effectively. The well thought out medicine will not cure any ailment by its mere mention. The aim of education is to prepare young minds to accomplish given task with more accuracy and perfection. The perfection is the hallmark of science.

I am sure, the young graduates will contribute to our society by following these basic truths in life and make a difference, wherever you are and in whatever you do. The knowledge and skills that you have acquired are not everything. They are probably sufficient to earn a living. But instead of learning to earn, you must try to earn for learning. Understand that ultimately you will shine as a leader if you possess an attitude of a good human being, a human being who tries to live among fellow human beings, for betterment of all, a human being who tries to give back much more to the society than what has received from it.

My best wishes to all the Students and Faculty members of Junagadh Agricultural University for success in their mission of working towards enhancement of sustained agricultural productivity for the nation.

JAI HIND