CONVOCATION ADDRESS

BY

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NAVSARI AGRICULTURAL UNIVERSITY

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Agricultural Future Time for Rainbow Revolution

Her Excellency the Governor of Gujarat, Chancellor of Navsari Agricultural University and the President of today's auspicious academic ceremony- Dr. Kamalaji; Guest of Honour and the Minister of Agriculture, Gujarat- Shri Dileep Sanghaniji, Vice Chancellor of this University Dr. A. R. Pathak and his colleagues, august Members of the Academic Council, invited dignitaries, dear students, Members of Press and electronic media, ladies and gentlemen. I am extremely thankful to the Board of Management for bestowing up on me this honour of delivering the Convocation address and share my views on the current scenario and future vision of agricultural education, challenges and opportunities of agricultural research, last but not the least the vital role of extension education and transfer of technology.

In contrast to the traditional Universities, the Agricultural Universities have been entrusted with the Herculean task of technology dissemination at the grass root level such that the package of practices evolved by the agricultural scientists should reach out the end users *viz.* farmers for

adoption in the field with consequent increment in the farm productivity and farmers' income. This kind of unique mandate has been assigned to Agricultural Universities on the pattern of Land Grant colleges of United States. Such type of vision and trust envisaged by Pandit Jawaharlal Nehru and his devout Lieutenants heralded creation of State Agricultural Universities in the early sixties of the twentieth century. The key role played by the SAUs, in the first Green Revolution and agricultural human resources development have been regarded as the milestones in the history of post independence that made India self-sufficient in food production which had in turn, led to self-reliance in milk, vegetables, fruits and inland fish production. Today, India has set forth into commanding position as a global economic power with primary and secondary sectors *viz.* agriculture and industry contributing modestly. At the current pace of growth rate, I would not hesitate to predict that by the year 2020, we will accomplish the top line both in terms of productivity and sustainability by transforming hitherto deemed liability of population in to a formidable asset of human resource capital.

I am very happy to see for myself the ongoing progress made both vertically in terms of quality and horizontally in terms of the volume of growth within six years of NAU. Two higher educational institutes *viz*. Post-graduate Institute of Agribusiness Management in 2007 and College of Veterinary Science and Animal Husbandry in 2008 have been created. Centre of a post-harvest technology with Mango fruit processing plant 5 t/d capacity with storage and ripening facilitie4s of 10 t/d capacity, Tomato Ketch-up processing unit of 5 t/d capacity and fruit juice processing and canning unit and blast freezing facilities. Now, you are in a position to provide technical know-how to extend shelflife of mangoes for about a month so that the fruits can be safely exported by four times compared to air cargo. In addition to above mega seed project, bio-fertilizer production, food quality testing lab amenities for students and farmers to stay on the campus, commissioning new research projects have been initiated. Another right step has been the biofertilizers and biopesticide production unit, which would make available sufficient quantity of inputs of economically important microbes for organic farming. Eco-friendly agriculture shows the great potential for growth, especially in the

eastern hilly areas of South Gujarat. For demonstrating these innovative practices to progressive farmers, NAU has already started organic cultivation of Banana, Papaya, Brinjal, Parval, etc. with matching yield and better quality.

Hunger-free World :

Agriculture is a vital development tool for achieving the Millennium Development Goals that call for halving by 2015 the number of people, suffering from extreme poverty and hunger. We also note that more than 50% people in the world are small and resource-poor farmers and another 20% rural landless. The challenge is to transform this concentration of poverty in agriculture into an opportunity. The Food Price Index of FAO, based on export prices for internationally traded food items climbed 37% in 2007. This was on top of 14% increase in 2006! Thus, a startling change is unfolding in the world's food markets. Soaring fuel prices have altered the equation for growing food and transporting across the globe. Coming to India, the Indian economy has been growing at about 8% per year since 2002 and even today the growth rate of more than 7% appears impressive. At the same time nearly 48% of the children are

under-nourished and challenge in the coming years are bigger. We must keep this paradox in mind in our future planning.

Rainbow Revolution :

What kind of dream you have for India? What kind of world in which India will be playing a very important role, do you dream of?

One of the greatest achievements of India in the last few decades has been Green Revolution. From a starving and hopeless country dependent on imported food-grains we have become a food surplus agriculturally advanced country. We have also ushered in a White Revolution by becoming the largest producer of milk in the world.

New developments in Biotechnology, I.T., Space Sciences, Energy, New Materials, health sector and Management will open extra ordinary opportunities in the coming decades. We should be prepared to bring several new revolutions which could give us all round improvement and a quantum jump. Such a Rainbow Revolution will have :

1 Eco-friendly and Sustainable Agriculture.
2 Blue Revolution: Seawater farming and fisheries.
3 Brown Revolution: making deserts and semi deserts bloom.
4 Black Revolution: Biofuels.
5 Multicolored Revolution: Horticulture and Food Processing.
6 White Revolution.
7 Drop of Water Revolution: Water use efficiency for agriculture i.e. more crop per drop.All these revolutions can help remove hunger and poverty, improve health, have cleaner and sustainable environment, minimize inequality and create new opportunities for a better and healthy world. It can transform India into a developed country and have leadership position in the world.

Prior to Green Revolution, farmers in India were largely dependent on monsoon, organic matter from farm animals and previous year's harvest of seeds. There were failures and successes. Beginning 1967, the Green Revolution changed all that. High yield Varieties (HYV), chemical fertilizers and pesticides and irrigation helped

raise agricultural output and within a short span of 10 years, India became food self-sufficient.

Green Revolution changed India's position from a food deficient to a food self-sufficient state. But it also exerted considerable pressures on the agri-ecosystem owing to extensive use of agrochemicals. Also the small farmers, which is a large percentage, were mainly left out by the side.

Eco-friendly & Sustainable Agriculture :

According to a study carried out by the World Watch Centre around 70,000 chemicals are in everyday use all over the world. Awareness about their effects has however, lagged far behind. An ICMR (Indian Council of Medical Research) study revealed (Garg, 2006) that 51% of the food items were contaminated with pesticides. Centre for Science & Environment, New Delhi found contamination in bottled water with agrochemicals like DDT, linden, etc.

Studies also indicate that only a small percentage of agrochemicals used- whether as fertilizer or pesticide- is effectively utilized- the rest

going as waste in soil, water or air. Indian farmers spend Rs.2 lac crores on agro inputs including agrochemicals, seeds, *etc.* Further in India nearly Rs.50,000 crores go as chemical fertilizer subsidy. Fertilizer use efficiency is drastically declining, e.g. in mid sixtees, 1 kg of chemical fertilizer gave 19 kg food grain, which has come down to less that 12 kg now. A study by IFPRI (International Policy Research Institute- Washington) (Gulati, 2007) has shown that 1 dollar spent on subsidy gives 0.53 dollar return only as against 6.9 dollar for R&D and 3.2 dollar for rural road. There is, therefore, an urgent need to find an alternative system which is more productive, efficient and eco-friendly.

An ecological production management system that promotes and enhances biodiversity, biological cycles and soil biology activity is the need of time. It has to be based on minimum use of agro inputs. Alternative bio-agro inputs such as biopesticides, biocomposts, biofertilizers and biocontrol agents will emerge as alternative and significant inputs. Scientific understanding of multi-microbial technology has considerably increased in recent times. Consortia of microorganisms (Mehta, 2007) consisting of

various combinations of nitrogen fixing, phosphate solubilizing and with bio-fungicide activities show excellent field results. Strains of microorganisms which can hasten the process of composting of organic residuals have been applied. Such microbes are celluloytic and lignolytic type. Homogenised fungal culture Trichurus spiralis, Paecilomyces fusisporous, Trichodermma viride *etc.* give accelerated biocomposts of uniform quality.

The 20-20 Model!

It is now worth noticing that a 20-20 Model, which helps reduce the input costs by 20% and at the same time improve the farm productivity by at least 20%, has been demonstrated in different locations and for different crops. The details of such a model was discussed in my publication in Agriculture Today History Book 2009 under the title "The 20-20 Model". Also we must emphasize an excellent model of NGO-University-industry, in which NAU was the key member, helped in evolving this model through field demonstrations. During the recent debate on Bt. Brinjal, such a model was discussed as easily implementable and farmer friendly one, which should be our high

priority. It is time to take such a model for the benefit of a large population of farmers and perhaps a State like Gujarat can take leadership.

Value-added Agriculture :

This has been the need of the time and if the key factor for lifting up the level of the society, several examples like value-addition chain points to the fact that the farm produce could be raised to much higher value through the input of good technology and process integration. Some examples like Castor Oil to Bio-nylon (from Rs.50/kg to Rs. 1100/kg), Spices and food processing- (value addition by 10 to 50 times), milk products show the case.

Based on the successful model of Students' Dairy Vidya Dairy, which was established through the cooperative efforts of Amul and GAU, a plan was prepared earlier to establish such value addition units at all the four campuses of GAU.

I am particularly happy to note that based on this line, NAU took the initiative and set up a model food processing unit, which can set an excellent example for other universities.

A Centre for Applied Marine Biotechnology :

The problem of global warming will have one of the greatest impact in the coastal areas. Closely associated with this problem, is the concern for water shortage and salinity. Coastal areas also have poorest of poor population. On the other hand, development like integrated farming involving aqua agro complexes, development and cultivation of salt tolerant plant- halophytes as well establishing coastal bioshields can greatly help in mitigating natural disasters, environmental improvement and economic returns. A number of groups including the scientists of NAU have been doing commendable work in these areas.

Einstien has said that 'Today's problems can be solved by tomorrow's technologies only'. Looking at the need of future, there is a case to set up a Centre of Marine Biotechnology Research and Application close to Navsari. Such a centre can be developed to provide leadership in areas like (i) Saline Water Agriculture including salt tolerant GM varieties (ii) Integrated Aqua-Agro Complexes (iii) Bioshields with biodiversity plantation for disaster mitigation and improvement of eco-environment (iv) Algae

based Biofuel products for healthcare and plant growth hormones, etc. (v) Coastal Eco-cities, *etc.* I am sure that such a centre can be established under Public-Private Partnership mode and can be a fitting tribute to the great people associated with Navsari and Dandi like Mahatma Gandhi, Dadabhai Navrojji and Jamshedji Tata.

New challenges for agricultural education :

At the time of independence, India had 17 colleges for agricultural and allied sciences. Soon after independence, our urgency of bringing about rapid increase in food-grain production necessitated re-examination of existing pattern of agricultural education. Thus, the Government of India appointed a University Education Commission under the Chairmanship of Dr. S. Radhakrishnan to review higher agricultural education in order to suggest ways for fulfilling the future requirements of the country. The commission recommended that agricultural education be recognized as a major national priority so that country is able to meet her food requirements. The first Indo-American team in 1955 made a study of agricultural research and

education in the country and in its report recommended strengthening and reorientation of agricultural education including veterinary education. The committee further recommended that the development of rural universities should be assisted by substantial grant-in-aid from the Centre, which will ensure autonomy and efficiency in operation. The first agricultural University thus came into being during 1960 in Pantnagar, UP in 1964, an Agricultural University Committee headed by Dr. Ralph W. Cummings, recommended the establishment of universities in six states with respect to work in agriculture, including animal science and allied sciences basically on the pattern of Land Grant College System of USA.

The ICAR committee under the Chairmanship of Dr. MS Swaminathan, constituted to examine the Agricultural Education System in India, has observed that "The agricultural education has to get out of its mould of a formal organized rigid framework and has to take the role of continuing education where the education process is adjusted to the needs of illiterate, unskilled farmers and farm households. This would imply that the individual farmer should have access to agricultural facilities at different stages of his like

cycle and within a period of the year in which availability of time to him is higher, it would also mean that the educational process has to be made more directly related to the local conditions and to be made more meaningful, shall have to be a part of work and employment culture of the area". We have to keep this aspect in mind in planning our system and implementing our agricultural programmes.

Epilogue :

Dr. S. Radhakrishnan has said that "Science has achieved more for the emancipation of the masses than the wisdom of sages". We are at a very interesting phase of human history, where scientific knowledge and its application can be the vital tool to help solve our major future problems. Thus, we should build the future programmes on the strong foundation already laid through our dedicated efforts and focused research and academic programmes based on partnerships with institutions, private sectors, NGOs and the key stakeholders.

Dear Students, receiving the degree and medals are a matter of extreme joy but it places great

responsibilities on the recipients. Science and Technology are important components of the wall dividing poverty and prosperity. We need to believe in ourselves and our dreams for a Rainbow Revolution that will bring happiness, prosperity and a just society. It will also have the fruits of education and scientific training aimed at helping the poorest of the poor men and women as imagined by Mahatma Gandhi in his concept of Antyodaya.

We must remember the words of Swami Vivekanand - "Let us all work hard, my brethren, this is no time for sleep. On our work depends the coming of the India of the future".

Thank you & good wishes,

JAI HIND ....