

PROCEEDINGS

Agricultural University Vice-Chancellors' Meet

Brainstorming Session on
'Challenges before NARS in National Food Production'
11-12 July, 2014

Sponsored by
Indian Agricultural Universities Association (IAUA)

Organised jointly by
Central Institute of Fisheries Education, Mumbai



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Proceedings of the Agricultural University Vice-Chancellors' Meet **Brainstorming Session on 'Challenges before NARS in National Food Production'**

11-12 July, 2014

Central Institute of Fisheries Education
(CIFE), Mumbai

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Director, CIFE, Mumbai

Organising Secretary:

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The Indian Agricultural Universities Association (IAUA)-sponsored two-day meeting of the Vice-Chancellors of Agricultural Universities and the Brainstorming Session on 'Challenges before NARS in National Food Production' was organised at the Central Institute of Fisheries Education (CIFE), Mumbai during 11-12 July, 2014. Vice-Chancellors representing 12 Agricultural/ICAR Deemed Universities and Deans/Directors of Research representing 8 universities from 12 states of the country participated in the meeting. The meeting was inaugurated by Shri. Abdul Sattar, Hon'ble Minister, Animal Husbandry, Dairy Development and Fisheries, Govt. of Maharashtra. Dr. S.N. Puri, Vice-Chancellor, CAU, Imphal was the Guest of Honour and Dr. A.K. Srivastava, Director/Vice-Chancellor, NDRI, Karnal and the President, IAUA presided over the inaugural function.



Dr. W.S. Lakra, Director/Vice-Chancellor, Central Institute of Fisheries Education (CIFE), Mumbai, welcomed all the dignitaries and underlined the significance of food security of the country and highlighted the role of NARS in meeting various challenges in the national food production system. Regarding the fisheries sector, he mentioned that the livelihood of

coastal fishermen should be improved and stressed upon the importance of inland saline water aquaculture considering its immense production potential by utilising the vast salt-affected areas. He also flagged the issue of climate change and the need for addressing the challenges. While welcoming all the dignitaries, he also informed the house that Dr. S. Ayyappan, Secretary, DARE and Director General, ICAR, had conveyed his best wishes to the meeting. Dr. Lakra also felicitated the Chief Guest, Guest of Honour and the President of the function.

Dr. S.N. Puri, Vice-Chancellor, CAU, Imphal and the Guest of Honour, conveyed the greetings from the faculty and students of North-Eastern states to all the delegates. In his address Dr. Puri mentioned that the food security act of the Central Government has put additional responsibilities on agricultural

scientists. He added that the biggest challenge before NARS is to narrow the productivity gap between lab and farm. He also added that diversification of agriculture by adopting animal husbandry and fisheries are essential. He said that to achieve a GDP of above 10%, an agricultural GDP of above 4% is essential.



While inaugurating the Vice-Chancellors Meet, Shri. Abdul Sattar, Hon'ble Minister, Animal Husbandry, Dairy Development and Fisheries, Govt. of Maharashtra called upon the Vice-Chancellors and the experts to discuss and provide suggestions for creating employment opportunities for the unemployed in the growing agro-industries, dairy and aquaculture sectors especially in Maharashtra. He stated that



Maharashtra shall become the model for other States in dairy and fisheries development in India. He said that he would take all the necessary action to make available at least 5 acres of farm in the State Fish Seed farm in the Aarey Colony, Goregaon to CIFE, Mumbai for research and training activities of the institute. He said that the Seed Farm would help the students from all over the country who come to CIFE to pursue their higher studies as well as the scientists in conducting their research and academic work. He further indicated that this may be considered as a gift from the State of Maharashtra for the students of CIFE. He said his knowledge in fisheries is limited as he belongs to an area of Marathwada region of Maharashtra where water is a scarce commodity even for drinking. He was sure that the development that has been made by Dr. S. N. Puri and his colleagues through several years of their experience in Marathwada will continue to help the small farmers. He





assured that his department will provide all the necessary support to the students of CIFE and the Vice-Chancellor/Director.

Dr.A.K.Srivastava, Vice-Chancellor, NDRI, Karnal and President, IAUA, in his Presidential address mentioned that the challenge before NARS is to feed the ever increasing population. He suggested adopting precision agriculture to produce more from less land. He stressed the importance of reducing the post-harvest loss in horticulture by proper post-harvest management. He also mentioned about the huge concerns about the indiscriminate use of pesticides in agriculture. He said that the pesticide use in India is about 570 g/hectare while the developed countries use 13 kg/hectare. He mentioned that in India 40% of population below the age of 3 are malnourished and, therefore, good quality food production is a challenge. He also said that good nutrition should be provided for the first 1000 days of a child to make a healthy individual. He added that although India has the largest cattle population, the productivity is less. He also mentioned the importance of conservation of indigenous breeds.

Dr.K.V.Rajendran, Principal Scientist, CIFE, proposed the vote of thanks.



Technical Sessions

The brainstorming session was conducted in four Technical Sessions consisting of lead presentations followed by panel discussion, open-house discussion with the following themes:

- I. Challenges, Strategies and Priorities in Animal Production systems
- II. Challenges, strategies and priorities: Research and Development in agriculture production
- III. Challenges, Strategies and Priorities: Horticulture production and diversification
- IV. Challenges, Strategies and Priorities: Enhancing fisheries and aquaculture production

Technical Session I:

Challenges, Strategies and Priorities in Animal Production systems

Chairman: Dr. A.K.Srivastava, Vice-Chancellor, NDRI, Karnal

Co-Chair: Dr. R.G.Dani, Vice-Chancellor, DPGKV, Akola

Lead Presentation

1 Conservation of Domesticated livestock- A necessity

Prof. C.S. Chakrabarti, Vice-Chancellor, WBUAFS, Kolkata

The presentation had a focus on the fact that land availability for agriculture is reducing while the production has to be increased. It also highlighted that with regard to animal production for human benefit a balance should be established between reproduction of animals and rate of exploitation of livestock. Exploitation of animals and livestock for human consumption is a necessity for nutritional security. But during exploitation care should be taken to keep records of the reproduction of the animal and the livestock.



The presentation also flagged important issues which need to be addressed by NARS:

- Over exploitation may lead to the elimination of that particular breed and variety. In many states of India there are special breeds of cattle, goat, sheep, pig, buffalo and poultry. Large scale consumption of these animals may make some of these breeds rare or endangered. Therefore, proper care must be taken to conserve these important breeds before over exploitation of them.
- To keep production level up, it is essential to maintain a balance between the production and consumption rate. Therefore, domesticated animals require special policy for conservation not only for market demand but also for the conservation of valuable germplasm they possess.
- Production of valuable breeds of the domesticated animals depend upon appropriate breeding policies based on conservation of germplasm, proper health care, nutrition and good management practices. Since most of these animal breeds are maintained by the farmers, they must be made aware about the importance of the breeds so that they would be able to manage the animals scientifically. At the same time, policy makers should see that the farmers get proper prices for their produce.

2. Animal reproduction and breeding strategy for dairy production

Dr.U.K. Mishra, Vice-Chancellor, CGKV, Durg

The presentation highlighted the issue associated with the non-availability of pure breed Indian cattle. It is suggested that breeding programmes for Indian pure breed cattle like Sahiwal, Gir, Tharparker for maintaining pure breed should be given priority. He suggested that cross- breeding programmes with exotic high yielding animals should be restricted to urban and semi-urban areas only. Similarly, native breeds of buffaloes like Murrah, Niliravi, surti should be maintained. The presentation suggested the following measures to meet the challenges faced by the livestock sector.

- Castrate stray bulls
- Inseminators should give door-to-door service
- Continuous monitoring of AI by govt. officials



- Maintain/produce good quality breeding bulls
- Maintenance of cold chain for transport of semen
- Monetary incentive to AI workers
- Continuous skill development for AI workers
- Green fodder development programme
- Loan at low interest rate for farmers
- Providing health cover for animals and extension service to farmers
- Strengthening linkage between university, farmers and Government
- Milk chilling centers and processing plants should be established
- Genomic studies for various economic traits should be taken by universities
- Identification of elite cows and buffaloes
- Synchronization of oestrous cycle for increased fertility

3. Animal Production Systems: Challenges and Prospects

Dr. M.Babu, Director, Centre for Animal Production, TANUVAS

The presentation focused on the reasons for low productivity in animals such as

- Reduced feed and fodder availability
- Low conception rate
- Less availability of quality breeder bulls
- Sub-optimal management practices
- High morbidity and mortality

It was also suggested to adopt long-term breeding policies, production of quality fodder and conservation of indigenous cattle. It also underlined the fact that efforts should be taken to reduce global warming by reducing methane production. Methods such as modifying fodder and chopping of feed to reduce methane emission by cattle and other eco-friendly, cost-



effective technologies should be adopted. Immunization of native chicken at national level to prevent Ranikhet Disease was stressed upon. The presentation also suggested that if the population size of a breed goes below 20000, the breed should be approved for conservation.

Panel discussion

Panelist 1: Dr. A.K.Mishra, Vice-Chancellor, MAFSU, Nagpur

The panelist stated that there will be growing requirement of milk and milk products in future for human consumption. He mentioned the following problems faced by NARS:

- Fragmentation of land
- Post-harvest loss
- Biotic and abiotic stress

The panelist opined that the four pillars of livestock sector are-Breeding, Feeding, Management and Health care. He suggested the following measure to increase the production of milk and milk products:

- Use of technologies like embryo transfer, IVF, cloning for increased conception rate
- Progeny tested bulls for breeding
- Improve AI delivery system; increased number of AI vans
- A national body to monitor bull production and evaluation
- Increase the availability of feed and fodder- Increase the area under fodder, use of non-conventional feed ingredients
- Modeling of rumen fermentation to improve fodder utilization
- Research in nutrigenomics to produce enriched products
- Establish fodder banks
- Mineral mixture production as per the requirement of the locality
- Improve housing of animals
- Biosecurity and disease surveillance to reduce loss due to diseases



- Improved diagnostics and prophylactics
- Improved farm extension activities
- Health delivery- need to improve facilities at hospitals
- Remunerative price for produce (Milk, meat, egg)
- Breeding policy should be revisited- use indigenous breeds for upgradation

Panelist 2: Dr. P.C. Bisoi, Dean, OUAT, Bhubaneswar

The panelist stressed on value-addition of products and suggested that management measures and diagnostic tools should be devised to prevent diseases impacting production.

Discussion:

Dr. S.N.Puri, Vice-Chancellor, CAU, Imphal, mentioned that feed and fodder are the major issues faced by the livestock sector and should be taken care of by increasing the area under fodder cultivation and to increase seed production of fodder crops. Dr. F.A. Zaki, Dean, SKUAST, Kashmir, suggested that embryo-transfer technology should be adopted by large farms to increase productivity. Dr. T.A. More, Vice-Chancellor, MPKV, Rahuri, suggested that seed chain should be established for fodder seed production. Dr. K. Ramasamy, Vice-Chancellor, TNAU, Coimbatore, mentioned that silage production should be enhanced to make fodder available during lean periods.

Chairman of the session, Dr. A.K.Srivastava concluded that for nutritional security we rely more on meat, milk and egg. Animal population has increased while land under fodder has decreased. Since the availability of feed and fodder is limited, he suggested to increase producing animals and to reduce non-producing animals. He also mentioned that the country is lacking in AI requirements and diseases like FMD, Brucellosis, Mastitis should be controlled for which vaccine production also needs to be increased.



Technical Session II:

Challenges, strategies and priorities: Research and Development in agriculture production

Chairman: Dr.S.N. Puri, Vice-Chancellor, CAU, Imphal

Co-Chair: N.C. Patel, Vice-Chancellor, JAU, Juanagadh

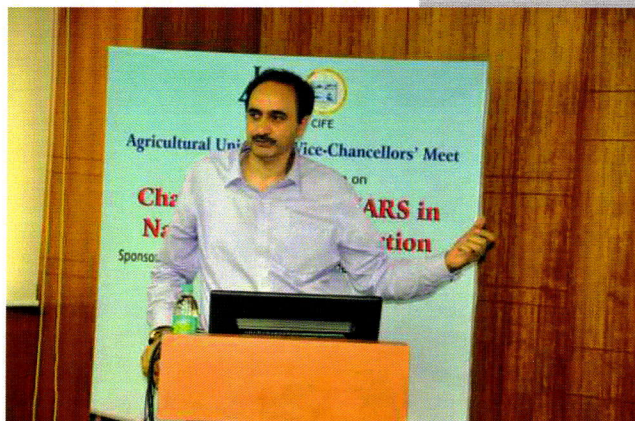
Lead Presentation

Research and Development Issues in Agriculture Production

Dr. K. Ramasamy, Vice-Chancellor, TNAU, Coimbatore

The presentation stressed upon the importance of microbes and underlined the fact that microbes will feed the world in future. It was also highlighted that there is a decline in manpower for agricultural activities and it is essential to modify the cropping pattern to suit mechanization. The presentation also outlined the following measures to improve production.

- Minimum support price for pulses and cereals
- Seed priming and priority for seed research
- Market driven production
- Integrated farming system
- Efficient use of water and nutrients
- Sensor based irrigation and nutrient application
- Utilization of anaerobes for crop improvement
- Mechanization of cultivation
- Use of straw for soil humification using microbes
- Application of phages for controlling pathogenic microbes



Panel discussion

Panelist 1: Dr. R.M.Bhagat, Director (Edu), SKUAST, Jammu

The panelist mentioned that crops for organic farming should be identified and encouraged for better price realization. He also suggested off-season vegetable cultivation to counter price fluctuations. He also mentioned about monkey menace in agriculture and suggested that measures need to be adopted to control the menace. The panelist opined that aquaculture is a relatively new intervention and needs training especially for women. He pointed out that considering the fact that there is an excellent market opportunity in urban areas and potential of good production in rural areas there is need for proper integration between these components.

Discussion

Dr. N. C. Patel, Vice-Chancellor, JAU, Juanagadh, mentioned that energy efficient harvesting machine for cotton and sugarcane needs to be developed. He also suggested that the following measures to be adopted to increase productivity:

- Decentralize power generation using agricultural residues
- Reduction of post-harvest losses by storage and processing
- Establishment of Agri-processing co-operative societies similar to Amul
- Development of micro-processor based micro-irrigation system.

Dr. T.A. More, Vice-Chancellor, MPKV, Rahuri, suggested that integrated farming system should be developed for small farmers. Dr. C.Vasudevappa, Vice-Chancellor, UAHS, Shimoga, stressed the need for development of varieties for specific soil and climatic conditions. Dr. Ramasamy, Vice-Chancellor, TNAU, Coimbatore, suggested to introduce certification and quality control courses in agricultural education.

Chairman of the session, Dr.S.N.Puri pointed out though microbes play a critical role farmers do not purchase microbes for use in the field unless it is given free and said that this gap should be identified and removed. He also suggested that technologies should be modified to suit hill agriculture. He further added that solutions to prevent destruction of crops by wild animals



should be found.

Technical Session III:

Challenges, Strategies and Priorities: Horticulture production and diversification

Chairman: Dr. T.A. More, Vice-Chancellor, MPKV, Rahuri

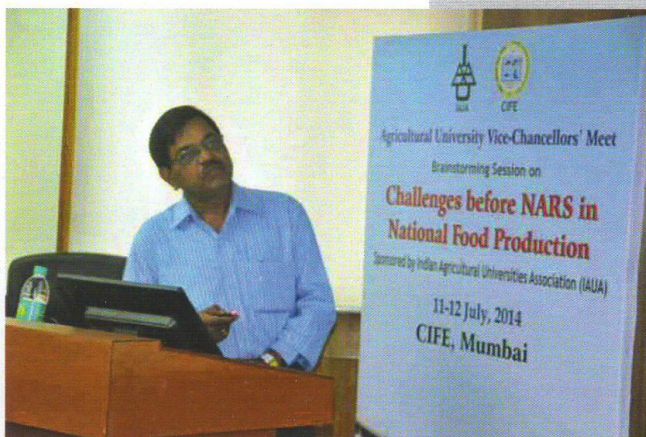
Lead Presentation

1. Indian production and export of horticultural crops

Dr. N.L. Patel, Dean, NAU, Navsari

The presentation provided the Indian and global scenario of fruit, flower, coconut, spices and vegetable crop production in detail. He stressed upon the intervention of agricultural engineering to raise agricultural productivity. The presentation also suggested the inclusion of fruits and vegetables in mid-day meal scheme in schools. It was also suggested that minimum support price for horticulture crops should be fixed. The presentation concluded with the recommendation of following measures to meet the challenges in the agricultural sector.

- Genetic up-gradation through hybridization
- Germplasm maintenance and utilization
- Breeding for yield and quality improvement
- Understanding the basic physiological mechanisms contributing to differential yield response
- Organic farming
- Precision farming technologies
- Mechanization of horticulture and fodder crops
- Special purpose machinery for horticultural crops
- Energy efficient equipments
- Reduction of post-harvest losses through appropriate primary processing and storage
- Use of micro-processor based irrigation systems



- Transfer of technology by using modern IT tools for interactive information outlets

2. Diversification in temperate horticulture crops- A perspective

Dr. Farrok Zaki, Dean, SKUAST, Kashmir

The presentation stressed upon the fact that diversification is the key driving force in horticulture and mentioned that diversification has increased the yield of horticultural crops world over. The presentation also highlighted the serious concerns of reduction in yield due to climate change. It was also suggested that a national level policy for allotment of land at national/state/district level for each crop should be established.

Panel discussion

Panelist 1: Dr. S.R. Chaudhary, Associate Director of Research, NAU, Navsari, mentioned that storage and cold chain for transport of fruits should be established. He suggested rejuvenation of crops such as mango, sapota, litchi.

Panelist 2: Dr. R.V. Borichangar, Associate Research Scientist, NAU, Navsari, voiced his concerns about agricultural lands being converted into urban areas. He suggested a way to increase productivity from small land area by adapting multi-storey integrated farming. In this system he suggested that the ground floor should have fish pond and water harvesting; second floor- piggery; third floor- agriculture and horticulture- flower, vegetables, pulses; fourth floor- solar panel for harvesting power from sunlight. He opined that more food can be grown in this type of vertical structures. He also said that 2-3 feet at the boundaries of farm land can be used efficiently by cultivating fruit crops.



Discussion

Dr. S.N.Puri, Vice-Chancellor, CAU, Imphal, mentioned that reduced availability of onion during off season is a serious problem. To overcome the problem, he suggested that development of technology to cultivate onion without irrigation in lean period is essential. He also mentioned that location specific agriculture has to be developed. Dr. C. Vasudevappa, Vice-Chancellor, UAHS, Shimoga opined that drip irrigation is being taken up in large-scale mostly driven by market force and is encourageable.

Chairman of the session, Dr.T.A.More emphasised the importance of diversification and multi-cropping system. He also stressed upon the need for increased water use efficiency by adopting drip irrigation and water harvesting. He called upon for increased nutrient use efficiency and precision farming for horticultural crops like banana, grapes and pomegranate. He also said that protected cultivation should be encouraged. He also suggested following measures for increased productivity

- Mechanization of farming operations as labour is expensive
- Adoption of integrated farming system
- Biotechnological intervention to increase production
- Location-specific agriculture
- Infrastructure development
- Adequate supply of planting material/seed for horticulture.



Technical session IV:

Challenges, Strategies and Priorities: Enhancing fisheries and aquaculture production

Chairman: Dr. C. S. Chakrabarti, Vice-Chancellor, WBUAF&S, Kolkata

Co-Chairman: Dr. A.K. Misra, Vice-Chancellor, MAFSU, Nagpur

Lead presentation

1. Development of ornamental fisheries In India: Potential and challenges

Dr. B. MadhusoodanaKurup, Vice-Chancellor, KUFOS, Kerala

The presentation highlighted the global status of ornamental fish and advantages of ornamental fisheries sector, export trends, Indian status in export, and composition of ornamental fish in export. He mentioned that 99% of fish are wild caught and hence captive breeding technology needs to be standardized for marine and freshwater fishes and transferred to farmers.

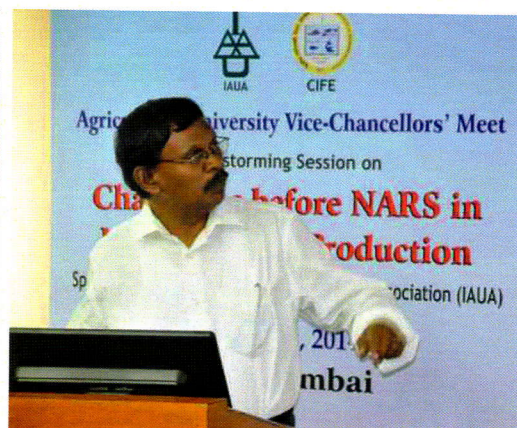
Further, the presentation also flagged the following issues faced by aquaculture sector which need to be addressed:

- Broodstock availability for new varieties
- Production of new varieties by genetic selection and improved production technologies
- Inadequacy of quarantine and certification centers
- Adoption of new packaging and transport technologies
- Penetration of world market in ornamental fish trade
- Mass production and supply of high quality fishes

2. Challenges in fisheries and aquaculture for enhancing national food production

Dr. C. Vasudevappa, Vice-Chancellor, UAHS, Shimoga

The presentation highlighted the global and Indian position in capture and inland fisheries. He highlighted the issues faced by Indian aquaculture and



presented the status of reservoirs. He suggested the following measures to increase the productivity of aquaculture sector.

- Genetic improvements including cryopreservation techniques
- Documentation and up scaling of diversification techniques
- Systematic development of culture of *Tilapia niloticus*
- Caution should be exercised while introducing new species
- Technology for fish breeding- a mission mode approach
- Basic physiology and biochemistry of breeding needs to be understood
- Production of quality fish seed -establishment of a network of hatcheries
- Feed based aquaculture- scientifically formulated feed availability for all varieties
- Regional feed mills to cater local requirement
- Resource-specific technologies- development of technology packages specific for the country

3. Strategies for enhancing aquafood Production, Utilization and Marketing

Dr. Jayasekaran, *Director of Research, TNFU, Nagapattinam*

The presentation gave the overall scenario of the Indian and global fish production. The presentation also stressed upon the importance of processing for value-addition. It was also suggested to follow certain measures to overcome the challenges posed to the aquaculture:

- Bridge the gap in fish production through community-based fisheries
- Introduce low cost re-circulatory systems for fish culture in areas of water scarcity
- Ensure regular supply of quality fish seeds by national networking of hatcheries
- Maintain stock of quality breeders (shrimps or fish) to produce quality fish seeds for stocking
- Set up industries to prepare quality fish feed with local ingredients to avoid exorbitant operational cost



- Introduce new freshwater species like GIFT, catfish, etc. to meet the demand of inland fish eating population
- Establish fish quality assurance and certification centres
- Introduce/ popularize suitable species for mariculture activities
- Establish fish diseasediagnosis laboratories
- Create awareness among public about the advantage of eating fish in line with National Egg Coordination Committee
- Minimise the post-harvest loss of 25% by value addition and waste utilization
- Convert small fishes into fish mince for making RTE or RTC products in retail consumer packs
- Increase the domestic demand for fish and processed fish products due to their nutritional benefits - Noon meal schemes
- Need to fix minimum support price for sale of fish/aquaculture produce by the Government
- Notify fish as a commodity under APMC Act (1966) to avoid exploitation of fishermen by commission agents
- Introduce proper cold chain to avoid quality loss during transport and marketing

Panel discussion

Dr. D. Seenappa, Professor & Chief Scientific Officer, UAS, Bangalore, highlighted the growth rate of Indian fisheries. He cautioned against unethical transboundary transport of fish and fish feed resulting in disease outbreaks. He cited *Penaeus monodon* as an example for this. He mentioned that aquaculture sector's contribution is increasing both domestically and globally, and is one of the fastest growing food sectors. To counter the stagnant growth in marine fisheries he suggested deep water fisheries, ranching program and community management system. He also mentioned that marine finfish breeding requires greater focus. He advocated generic feed as well as specialised larval, fry, broodstock feed for aquaculture development. He stressed upon the importance of disease management strategies and surveillance to control disease outbreaks and to reduce losses due to diseases. He said that private Investment needs to be encouraged especially in shrimp aquaculture.



Dr. C.S. Chakraborty, *Vice-Chancellor, WBUAFS, Kolkata*, pointed out that the biodiversity is lost by exporting ornamental fish from wild collection and hence breeding techniques needs to be developed. Dr. C.Vasudevappa, *Vice-Chancellor,UAHS, Shimoga*, suggested that efforts should be made to popularize indigenously bred fishes and R&D for color development in ornamental fishes.

Discussion

Dr.R.G. Dani, *Vice-Chancellor,DPGKV, Akola*, said that at present only a couple of companies are making fillets of *Pangasius* and *Tilapia* and there is a tremendous scope for fillet based fast food industry.

Dr.H.S.Gupta *Director/Vice-Chancellor, IARI, New Delhi* made a brief presentation on '**Agricultural Production System**'. He praised the role of agricultural science and education in tiding over the food crisis in 1960s and 70s. He mentioned that the following challenges are faced by NARS.

- Per capita availability of water is one third as compared to 1950 and hence there is a need to find out means to produce more from less of water
- Many crop yield has stagnated
- Nutritional insecurity - protein malnutrition and micro-nutrient malnutrition
- Policy correction: exporting protein rich soya while using it as oilseed while its oil content is low
- Atleast bring 2 million hectares under pulses cultivation to produce 2-4 million tons of pulses which is being imported now to reduce nutrition deficiency
- Only 40-50% technologies have gone to farmers because of the poor extension system
- Need to increase R&D at least to 2% of GDP
- In 2023, India will be a net food importing nation

Valedictory Session

Chair: Dr. Arvind Kumar, DDG (Education), ICAR, New Delhi

Co-Chair: Dr. A.K. Srivastava, Vice-Chancellor, NDRI, Karnal

The session-wise recommendations (appended) were presented and detailed discussion on this was done.

Dr. R.G. Dani said that at present no collaborative programs with international agencies like ICRISAT, IFFRI etc. are in place and he opined that collaborative programmes with international agencies should be encouraged. He mentioned about the need to understand the reasons for farmer suicides and steps to counter them. He also stressed upon the importance of rain water conservation systems and mentioned how rain water harvesting has helped transform agriculture in water deficit areas. He said that water harvesting and conservation should be integrated in research programs. He also highlighted the importance of maintaining high safety standards in fish and meat products.



The Chairman of the session, Dr. Arvind Kumar highlighted the much needed reforms brought by World Bank funding for Indian agricultural research. He said the funding provided much flexibility for NARS for overseas training and exchange of scholars. He mentioned about state Government interference with many reforms in SAUs and called for governance reforms and more autonomy. He also suggested highlighting the major recommendations in prioritized Action Point mode with explanatory notes. He advised to constitute a Consultative Group of Agricultural Universities (with 3-4 people) to represent agricultural education in all the forum. He mentioned that Parliamentary Standing Committee on Agriculture has appreciated the NARS based on 6 monthly Action taken Reports from ICAR/DARE and added that networking projects are a successful example. He concluded that in animal and fisheries sectors, seed, feed and breed are the triad of development

Dr. A.K. Srivastava, Vice-Chancellor, NDRI, Karnal and the President, IAUA, in his concluding remarks stressed the need to achieve 4% growth in agriculture and 6% in livestock sector. He advised quality control all along the supply chain, efficient nutrient management and disease control for increasing the productivity. He also mentioned about the important forthcoming events and requested the dignitaries to bookmark the calendar to attend the following events:

- VC Convention - 8-9 November 2014 on Making World Class Agricultural Universities in India
- Agricultural Science Congress during 3-5 Feb at NDRI on Small Farm Holder

Dr. W.S. Lakra, Director and Vice-Chancellor, CIFE, proposed the vote of thanks. He said the brainstorming session had representation, Vice-chancellors or their representatives, from twelve states and expressed satisfaction on the overall outcome. He profusely thanked all the dignitaries for attending the programme. He also thanked all the committee members for helping in conducting the event successfully.

Session-wise Recommendations

Technical Session I

SUB THEME: Challenges, Strategies and Priorities in Animal production systems

Recommendations

1. Green fodder production should be increased utilizing common property resources. Fodder seed production should be brought under national seed chain.
2. Requirements of breeding bull should be met to match the requirements for AI of the entire breedable cattle and buffalo population of the country.
3. Improved artificial insemination delivery and increased coverage at farmers door.
4. Establishment of bull mother farm of indigenous cattle breeds like Sahiwal, gir, Tarparkar, Red Sindhi and Murrah buffalo so as to produce superior breeding bulls and conserve the indigenous animals.
5. Vaccination of livestock against FMD, Mastitis and Brucellosis and poultry against Ranikhet disease with quality vaccines periodically
6. Use of modern biotechnological interventions like embryo transfer, IVF, ovum pickup, cloning etc., for faster multiplication of elite cows and buffaloes
7. The extent of milk processing is to increase. At village level "Bulk milk cooler" are to be established. Increase value addition in livestock products.

Technical Session II

SUB THEME: Challenges, Strategies and Priorities: Research and Development in agriculture production

Recommendations

1. Rain-fed agriculture should capitalize the microbe-based drought proofing (Pink pigmented foliar microbe) and save the crop in distress.
2. Rhizosphere Engineering should be attempted to improve the crop yield.

3. Indian agriculture should aim at market specific export oriented crop production. Wherever possible, the available export market should be saved from rejection and value-added for increased access and market share.
4. Concept of location specific cultivation of certain crops where productivity is of very high order, needs consideration.
5. In order to conserve our resources, precision farming involving use of appropriate sensors for irrigation and fertilizers should receive adequate attention.
6. Efforts to be strengthened to bring out commercial transgenic cotton varieties from public sector institutions.
7. Farm mechanization leading to reduction in drudgery should receive priority. While doing so replacement of machines using fossil fuel by machines using alternate sources of energy should be aimed. Crops suitable for mechanization should be developed.
8. Efforts should be made to bridge the gap between yield potential and actual yields realized on the farm.
9. Molecular breeding for stress and drought needs more attention.

Technical Session III

SUB THEME: Challenges, Strategies and Priorities: Horticulture production and diversification

Recommendations

1. Technological support to improve productivity of horticulture crops and bridge the yield gap.
2. Encouragement of precision farming and protected cultivation.
3. Diversification of crops.
4. Multi-storeycropping system should be promoted.
5. Development of mechanization friendly varieties and processing specific varieties.
6. Minimum support price for horticulture crops should be given.
7. Reduction of post-harvest losses, value addition and processing.
8. Integrated farming system in drylands.
9. Location specific technologies and varieties needs to be developed.
10. Infrastructure development for storage and processing.
11. Technology to cultivate onion in rain-fed/low irrigation conditions and throughout the year.
12. Development of technology specific for horticulture/agriculture in hilly areas.
13. Upscaling the F1 hybrid technology.

14. Breeding for quality produce.
15. Mechanization in horticulture.
16. Research in climate resilient agriculture.
17. Develop infrastructure in horticulture industry.
18. Seed and planting material production requires attention.

Technical Session IV

SUB THEME: Challenges, Strategies and Priorities: Enhancing fisheries and aquaculture production

Recommendations

1. Fisheries sector's contribution has increased and is still increasing both domestically and globally, but challenges abound in terms of increasing both production and productivity.
2. Major challenge in sustaining the stagnant marine fish production - greater policy focus and investment in mariculture, deep sea fishing and encouraging community based management approach.
3. While *P. vannamei* has done wonders in shrimp aquaculture, more R&D work on *P. monodon*, commercial technology development of finfish species and sustaining the gains would be important challenges.
4. While large potential exists to bring new waterbodies under culture fisheries (horizontal expansion approach), equal emphasis on increasing productivity of existing production systems through intensification and higher input use efficiencies shall be given.
5. Ensuring quality seed availability and access, effective disease management and surveillance systems, and ensuring quality assurance in all respects.
6. Promises of innovative technologies like pen culture, cage culture (emulating success stories from Jharkhand, Chattisgarh, Rajasthan, Maharashtra), trout culture in Himalayan waters, etc, seaweed culture, etc. shall be realised.
7. Increase and encourage private investment in fisheries and aquaculture.
8. Extension system should be strengthened to bridge the gap between lab and pond.
9. R&D programmes should be made fisher and fish farmer driven to increase their adoption.

Agricultural University Vice-Chancellors' Meet
Brainstorming Session on
'Challenges before NARS in National Food Production'
 Sponsored by Indian Agricultural Universities Association (IAUA)
 11-12 July, 2014
 Central Institute of Fisheries Education (CIFE), Mumbai

11th July, 2014

INAUGURAL SESSION 10.00 to 11.30 AM

10.00 to 10.05 AM	Presentation of bouquet	
10.05 to 10.10 AM	Invocation	
10.10 to 10.15 AM	Lighting the lamp	Chief Guest and Guests on the dais
10.15 to 10.30 AM	Welcome address Felicitation of Chief Guest	Dr. W. S. Lakra, Vice-Chancellor CIFE, Mumbai
10.30 to 10.50 AM	Address by Chief Guest	Shri Abdul Sattar, The Hon'ble Minister Animal Husbandry, Dairy Development and Fisheries Govt. of Maharashtra
10.50 to 11.05 AM	Presidential address	Dr. A.K. Srivastava, Vice-Chancellor, NDRI, Karnal and President, IAUA
11.05 to 11.10 AM	Vote of thanks	Dr. K.V. Rajendran Principal Scientist, CIFE
11.10 to 11.30 AM	TEA BREAK	

Technical Session I

SUB THEME: Challenges, Strategies and Priorities in Animal production systems

11.30 AM - 01.30 PM

Chairman: **Dr. A. K. Srivastava**, Vice-Chancellor, NDRI, Karnal
 Co-Chairman: **Dr. R.G. Dani**, Vice-Chancellor, DPGKV, Akola

Time	Title of the paper	Speaker
11.30 a.m. to 12.00 p.m.	The Conservation of domesticated Livestock-A necessity	Dr.C. S. Chakrabarti, Vice-Chancellor, WBUAF&S, Kolkata
12.00 p.m. to 12.30p.m.	Animal reproduction and breeding strategy for dairy production	Dr. Umesh K. Mishra, Vice-Chancellor, CGKV, Durg
12.30 p.m. to 12.50p.m	Animal Production Systems: Challenges and Prospects	Dr. M. Babu, Director Centre for Animal Production, TANUVAS

12.50 p.m. to 01.20 p.m.	Remarks of the Panelists and Discussion	Dr. A.K. Misra, Vice-Chancellor, MAFSU, Nagpur
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Dr. P.C. Bisoi,
Dean, OUAT,
Bhubaneswar

01.20 p.m. to 01.30 p.m.	Remarks by the Chairman
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01.30 p.m. to 02.30 p.m. LUNCH BREAK

Technical Session II

SUB THEME: Challenges, Strategies and Priorities: Research and Development in agriculture production

02.30 PM- 03.30 PM	Chairman:	Dr. S. N. Puri, Vice-Chancellor, CAU, Imphal
	Co-Chairman:	N.C. Patel, Vice-Chancellor, JAU, Juanagadh

Time	Title of the paper	Speaker
02.30 p.m. to 3.00 p.m.	Research and Development Issues in Agriculture Production	Dr. K. Ramasamy, Vice-Chancellor, TNAU, Coimbatore
03.00 p.m. to 03.20 p.m.	Remarks of the Panelists and Discussion	Dr. R.M. Bhagat, Director (Edu), SKUAST, Jammu

03.20 p.m. to 03.30 p.m.	Remarks by the Chairman
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03.30 p.m. to 03.45 p.m. TEA BREAK

Technical Session III

SUB THEME: Challenges, Strategies and Priorities: Horticulture production and diversification

03.45 PM-04.45PM	
Chairman:	Dr. T.A. More, Vice-Chancellor, MPKV, Rahuri
Co-Chairman:	Dr. K. Ramasamy, Vice-Chancellor, TNAU, Coimbatore

Time	Title of the paper	Speaker
03.45 p.m. to 04.05 p.m.	Indian production and export of horticultural crops	Dr. N.L. Patel, Dean, NAU, Navsari
04.05 p.m. to 04.30p.m.	Remarks of the Panelists and Discussion	Dr. F.A. Zaki, Dean, SKUAST, Kashmir
		Dr. S.R. Chaudhary, Associate Director of Research, NAU, Navsari
		Dr. R.V. Borichangar, Associate Research Scientist, NAU, Navsari

04.30p.m. to 04.45 p.m. Remarks by the Chairman

06.00 pm to 07.30 pm CULTURAL PROGRAMME

12th July, 2014

Technical Session IV

**SUB THEME: Challenges, Strategies and Priorities:
Enhancing fisheries and aquaculture production**

10.00 AM-11.30 AM

Chairman:

Dr. C. S. Chakrabarti, Vice-Chancellor, WBUAF&S, Kolkata

Co-Chairman:

Dr. A.K. Misra, Vice-Chancellor, MAFSU, Nagpur

Time	Title of the paper	Speaker
10.00 a.m. to 10.20 a.m.	Ornamental fisheries development: Challenges and potential	Dr. B. Madhusoodana Kurup , Vice-Chancellor, KUFOS, Kerala
10.20 a.m. to 10.40 a.m.	Aquaculture diversification: Challenges and prospects	Dr. C. Vasudevappa , Vice-Chancellor, UAHS, Shimoga
10.40 p.m. to 10.55 p.m.	Strategies for enhancing aquafood production, utilization and marketing in Tamil Nadu	Dr. Jayasekaran , Director of Research, TNFU, Nagapattinam
10.55 a.m. to 11.15 a.m.	Remarks of the Panelists and Discussion	Dr. D. Seenappa , Prof. & Chief Scientific Officer, UAS, Bangalore

11.15 a.m. to 11.30 a.m. Remarks by the Chairman

11.30 a.m. to 11.45 a.m. TEA BREAK

11.45AM to 12.30 PM

Valedictory

Chairman:

Dr. Arvind Kumar, DDG (Edu), ICAR

Co-Chairman:

Dr. A. K. Srivastava, Vice-Chancellor, NDRI, Karnal

Presentation of session-wise recommendations

List of participants

1. Dr. Arvind Kumar, DDG(Edu), ICAR
2. Dr. S. N. Puri, Vice-Chancellor, CAU, Imphal
3. Dr. C. S. Chakrabarti, Vice-Chancellor, WBUAF&S, Kolkata
4. Dr. A. K. Srivastava, Director, NDRI, Karnal
5. Dr. H.S. Gupta, Director, IARI, New Delhi
6. Dr. N.C. Patel, Vice-Chancellor, JAU, Juanagadh
7. Dr. W. S. Lakra, Vice-Chancellor, CIFE, Mumbai
8. Dr. T.A. More, Vice-Chancellor, MPKV, Rahuri
9. Dr. R.G. Dani, Vice-Chancellor, DPGKV, Akola
10. Dr. K. Ramasamy, Vice-Chancellor, TNAU, Coimbatore
11. Dr. A.K. Misra, Vice-Chancellor, MAFSU, Nagpur
12. Dr. Umesh K. Mishra, Vice-Chancellor, CGKV, Durg
13. Dr. C. Vasudevappa, Vice-Chancellor, UAHS, Shimoga
14. Dr. B. Madhusoodana Kurup, Vice-Chancellor, KUFOS, Kerala
15. Dr. M. Babu, Director, Centre for Animal Production, TANUVAS
16. Dr. R.M. Bhagat, Director (Edu), SKUAST, Jammu
17. Dr. P.C. Bisoi, Dean, OUAT, Bhubaneswar
18. Dr. F.A. Zaki, Dean, SKUAST, Kashmir
19. Dr. Jayasekaran, Director of Research, TNFU, Nagapattinam
20. Dr. D. Seenappa, Prof. & Chief Scientific Officer, UAS, Bangalore
21. Dr. S.R. Chaudhary, Associate Director of Research, NAU, Navsari
22. Dr. R.V. Borichangar, Associate Research Scientist, NAU, Navsari
23. Dr. R.P. Singh, Executive Secretary, IAUA
24. Dr. Hukamsingh Dhaker, Sr. Scientific Officer, DR BSKKV, Dapoli

Central Institute of Fisheries Education, Mumbai



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Indoor Sports Complex



National Library



Hostels

