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National Research Centre For Agroforestry, Jhansi-284 003

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UNION AGRICULTURE MINISTER HON'BLE SHARAD PAWAR VISITS NRCAF, JHANSI

Hon'ble Sharad Pawar, Union Minister for Agriculture and Food Processing Industries visited NRC for Agroforestry and IGFRI, Jhansi on 30th January 2011. Shri Pawar expressed in his address that he was eager to visit these Institutes for a long time, and congratulated the scientists of both institutes for the research work. Shri Pawar stressed the need for development of agroforestry, fodder and feed resources so that the huge livestock populations in the country are fed adequately. He emphasized that in semi-arid conditions agroforestry plays an important role for tree fodder availability.

Shri Pradeep Jain 'Aditya', Hon'ble Union State Minister for Rural Development, Govt of India also graced the occasion. Dr S. Ayyappan, Secretary DARE and Director-General ICAR, Dr P. K. Basu, Secretary, Department of Agriculture & Cooperation, Dr A. K. Singh, Deputy Director General (NRM) and Dr S. K. Datta, Deputy Director General (Crop Sciences), from the ICAR were also present on the occasion. A scientists-farmers interaction was organized with the Hon'ble Ministers. A large number of farmers, press and media persons attended the programme.

Dr S. Ayyappan, Secretary, DARE & DG, ICAR in his address informed that development of forage resources including agroforestry is high on the agenda of the ICAR.
Dr. S.K. Dhyani, Director, NRCAF, Jhansi presented the salient research achievements of the Centre including the Garhkundar watershed which is being appreciated at national level.

LOCAL INNOVATIONS FOR SUPPORTING CLIMATE RESILIENT AGRICULTURE

It is now a proven fact that the global climate is changing and measures for its mitigation and adaptation are essential to face the new challenges. Agriculture is likely to be hit most due to change in extreme weather events, inter annual variability and mean climate parameters which will negatively affect crop and animal yields, and resilience of agro ecosystems. Rise in temperature by 0.3 degrees as anticipated by 2030 will affect the production of main crops viz. rice and wheat. The scientific community is highlighting the urgency of situation for timely corrective measures so that the number of food insecure people, currently more than 800 million in tropical and sub-tropical countries, should not go up. In response, the international bodies and the governments have started paying increased attention to measures aimed at mitigation and adaptation. The main concern of changing climate is the global warming, which has been attributed to the emission of green house gases and therefore, international community has worked out frameworks to abate or sequester these emissions. The need of the hair is to plan mitigation strategies to reduce overall emission and initiate *adaptation* to curtail vulnerability to climate risks. In absence of such adaptation initiatives at local, regional, national and international levels, the number of people facing food insecurity may increase.

India has been on forefront in taking initiatives for mitigation and adaptation to climate

change. Recently, a mega project "National Initiative on Climate Resilient Agriculture (NICRA)" has been launched by ICAR to develop improved technologies through short- and long-term research and also demonstrate the existing technologies on farmers fields for enhancing resilience of Indian agriculture to changed scenarios at present and in near future. Strengthening and creation of modern research infrastructures and capacity building for high-tech innovations is one of the important objectives of this scheme. Selection of promising genotypes and livestock breeds with greater tolerance to climate stress, demonstration of existing technology in 100 vulnerable districts and empowering farmers to cope up with the climate variability are the other aims to be attempted.

The fragile ecosystems such as arid and semi-arid regions are more vulnerable to climate change as small disturbance may cause great imbalances and loss to sustainability. For the people directly experiencing adversities of climate change, initiatives at national and international levels are meaningful, but local efforts at micro-level are more useful in helping them to adapt and face complex challenges such as abiotic stresses on crops and animals, shortage of water, land degradation and loss of biodiversity. The following adaptation mechanisms innovated and developed traditionally by local dwellers to cope up with the adversities of climate, if exploited fully, are capable of providing resilience to agricultural production in India.

1. The unique indigenous rain water harvesting structures and systems displaying their innovative technical skills can provide resilience against droughts. The rainwater harvesting structures such as *Tankas* (dugout and lined circular holes, 3-4 m dia.), *Nadi* (small excavated or embanked village ponds), *Khadins* (crops grown on harvested water by constructing earthen bunds) etc are in vogue in arid area of Rajasthan. The khadin cultivation system of run off farming is practiced in Jaisalmer since 15th century to cope up with the vagaries of climate and make the best use of meager rainfall. Similarly, *Haveli* system of Bundelkhand region where rainwater is impounded in bunded fields during monsoon and rabi crop is taken on residual soil moisture is capable of yielding dependable harvest in rain deficient seasons. Likewise, in addition to above traditional systems, the watershed development programmes taken across the country are playing paramount roles in mitigating droughts/ famines and ensuring sustenance.

2. Application of FYM and green manuring practices are the best antidotes for the soil health. These practices not only balance soil fertility in respect of all macro- and micro-nutrients but also improve physical conditions of soil enabling it to resist against changes in temperature and wind regimes.

3. Application of balanced fertilizers (NPK and micronutrients) as an integrated approach for nutrition to crops is a proven technology for achieving sustainable production. It also provides resilience to the ago-ecosystem against weather adversities.

4. The indigenous wisdom of providing protection to crops against likely event of frost by irrigating fields in advance and moderating micro-level temperature by burning residues on field bunds hold great promises. However, burning residues to be discouraged in view of pollution and release of CO_2, hence compositing be advocated. Providing sprinkler irrigation to crops, vegetables and horticultural orchards has been found very effective by farmers to save these crops from cold waves in Rajasthan.

5. Agroforestry systems viz. agri-silviculture, silvi-pasture and agri-horticulture provide insurance against crop failure and other risks that farmers are likely to face in the event of weather extremes. The *Prosopis cineraria* – pearl millet based agri-siviculture system in Rajasthan is well known all around the world. The adaptive potential of Khejri (*Prosopis cineraria*) trees can be gauged from the fact that it gets luxuriant growth and produce more foliage during drought years. Khejri also enriches soil fertility and does not compete for moisture with crops grown in its association. The silvipastoral systems of tree species like *P. cineraria,* and *Zizyphus numularia* and grasses *Cenchrus. ciliaris, C. setigerus, Lasiurus*

sindicus are well adapted to arid climate and play direct role in sustaining animal husbandry. The agrihorticulture system, *Ziziphus mauritiana* (grafted ber) intercropped with legumes like cluster bean/ moth bean/ green gram give high economic returns and also provide year-round employment. The agroforestry and/or multifunctional farming systems that are well adapted to local conditions of all agro ecological regions have been developed and demonstrated by research institutions like NRCAF, Jhansi, CAZRI, Jodhpur, CRIDA, Hyderabad and state agricultural universities (SAUs). These alternative land use systems are not only efficient in reducing risks of climate change but also ensure livelihood. The added advantage of agroforestry is that the trees fixes and stores carbon from the atmosphere via photosynthesis and function as active carbon for many years and continue to store carbon until they are harvested or die.

6. Planting of shelterbelts/ windbreaks (vegetative barriers of trees/ shrubs/bushes) across wind direction has been proved as useful protective measure to minimize hazardous effect of speedy hot and cold winds. The shelterbelts reduce wind velocity thus soil erosion, provide protection to roads, railways, water bodies, canals etc. and create favorable environment for cropping, horticulture and livestock enterprises. Besides shelterbelts also supplement local demands of fuel, fodder and timber.

7. Exchanging local breeds of animal which are capable of tolerating adverse climatic conditions and disease may provide better adaptation to climate change. For example, *tharparkar* cow and *jamunapari* goats well adapted to harsh climatic condition of arid areas may help in sustaining productivity in new areas of similar climate.

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TRAINING PROGRAMME ON SAS FOR AICRPAF SCIENTISTS

Project Coordinating Unit of AICRP on Agroforestry, is conducting regular training programmes for the scientific and other staff of the project with an aim to train them an tools and procedure to be used in agroforestry research. In past, trainings have been conducted in the field of tree mensuration and modeling, tree improvement, biofuels and statistical analysis and interpretation of agroforestry experimental data.

In this context, one week training programme on "**Data Analysis of Agroforestry Experiments Using SAS"** was organized in association with IASRI, New Delhi from 17th - 22nd January, 2011. The training programme was fully sponsored by IASRI through "Strengthening Statistical Computing for NARS" under NAIP. The inaugural function was attended by Dr. S. K. Dhyani, Director, NRCAF and Project Coordinator of the Project and Dr V. K. Gupta, National Professor, ICAR. The training programme was attended by 23 participants from different centres of AICRP on Agroforestry. The objective of the training was to sensitize the scientist with SAS computing software and its applications in analysis of agroforestry experiment data and design methodologies for laying agroforestry experiments and analyzing the data. The training programme mainly focused on practical classes related to SAS fundamentals, descriptive and exploratory analysis of data, recent advances in experimental designs, webex sessions on different statistical topics, growth and biomass modeling, SAS Macros, JMP software and SAS Enterprise Guide. The participants from different coordinating centres analysed their own experimental data sets using SAS. Moreover, the designs for laying future experiments at these centres were also discussed at length and

Training coordinators suggested appropriate designs and analysis methodologies for their experiments. The resource persons, Dr. Rajender Prasad, Dr. V. K. Gupta, Dr Seema Jaggi, Dr. L. M. Bhar, Dr Ramasubramanian, Dr Krishan Lal, Dr. Sivaramane, from ISARI, New Delhi and Dr Ajit from NRCAF, Jhansi. Dr Arvind Kumar, DDG (Education), ICAR was the Chief Guest for the valedictory Function which was presided over by Dr. S. K. Dhyani, Director, NRCAF, Jhansi, Dr. Dhyani insisted the trainees to use SAS in their experimental data for increasing the quality of interpretation of their experimental findings, which will be very useful for the Project and their own professional career. Dr. V. K. Bhatia, Director, IASRI and Dr. V. K. Gupta National Professor, ICAR were also present during the function. Dr. Rajender Prasad from IASRI and Dr. A. K. Handa and Dr. Ajit were instrumental in the successful conduct of the training programme.

Awareness cum Training Programme on "Protection of Plant Varieties and Farmers Rights Act"

An awareness cum training programme on "Protection of Plant Varieties and Farmers Rights Act" was assigned to the National Research Centre for Agroforestry, Jhansi, during the current financial year (2010-11) by the PPVFR Authority, NBPGR, New Delhi. The purpose of training was to bring awareness about provisions of National Gene Fund and activities of PPVFRA to the notice of Breeders, Development workers, farming communities, tribal communities in and around the area of domain of SAUs and ICAR institutions. The training programme was conducted on 10th February, 2011 at the Centre. The plant breeders, scientists, technical staff and research scholars of NRCAF and IGFRI, Jhansi, lecturers of agricultural department, Bundelkhand University, concerned scientists of CSWCRTI centre, Datia, Officer In-Charge and staff of KVK, Bharari, Jhansi and distt. Lalitpur, officials of agriculture and horticulture department, Jhansi (U.P.), officials of leading NGOs at Bundelkhand region and progressive farmers of distt. Jhansi, Datia, Lalitpur and Jalon have attended the training programme. A total of 100 participants were registered for the training. However, total participants were much more than given target.

During the training programme detailed information was given on the topics *viz.* plant variety development process and uses, local land races and extant varieties, farmers rights and their protection, objectives of PPVFRA act, protection of varieties, plant varieties and farmers rights, other rights of farmers, breeders rights, registration and duration of protection under act, depositing the samples, Indian plant variety journal and notification of varieties, gene bank, profit sharing, national gene fund, unknowingly breach of rights, exemption from fee, submission of application and other issues etc. A printed bulletin on PPVFRA was also released on this occasion and provided to each participant. The trainees have taken keen interest on the subject and raised several queries which were satisfactorily replied by the experts. All the resource persons who have delivered the lectures, have undergone formal trainings of 5-7 days on IPR, hence, the programme was a grand success.

TRAINING ON CULTIVATION OF SEED SPICES

Training of 60 farmers on Cultivation of seed spices in Bundelkhand was organized by NRC Seed Species, Ajmer (Raj.) at NRCAF, Jhansi during 19th to 20th February, 2011. Sixty farmers from Tikamgarh, Datia, (M.P.) and Jhansi, Lalitpur (U.P.) participated in the training. Dr. M.M Anwar, Director, NRCSS, Ajmer inaugurated the training programme.

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KISAN GOSHTI

Centre organized Kisan Goshti at village Nayakhera, Domagor Pahuj watershed area of District Jhansi on 11th March, 2011. More than 500 farmers, farm woman and members of NGOs participated in the programme.

EXHIBITION

Centre participated in the AGROVISIOAN-2011 at 10th Agricultural Science Congress at NBFGR, Lucknow organized by NAAS, New Delhi from 10th to 12th February,2011. Agroforestry Stall was exhibited on the occasion.

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AWARD

- NRCAF received First Prize for Best Office Garden in the Regional Phal, Shak Bhaji Avam Phool Pratiyogita organized by the State Government Horticulture Department, Jhansi from 26th -27th February, 2011.

- Dr. R. P. Dwivedi Sr. Scientist was Awarded Fellow of the Range Management Society of India, IGFRI, Jhansi (November, 2010).

- Dr. R. P. Dwivedi Sr. Scientist received Young Scientist Award of Bhartiya Krishi Anusandhan Samiti, Karnal, during Rashtriya Sangosthi at NRCAF & Bundelkhand University, Jhansi. (21-23 January, 2011).

- Dr. R. P. Dwivedi Sr. Scientist received Best Oral Paper Presentation Award in National Symposium on "Integrated Farming Systems for Sustainable Agriculture- Challenges and Opportunities (IFFSA-2011)" held at Institute of Agriculture. Sciences, Bundelkhand University, Jhansi from 19th to 21st February, 2011.

- Dr. R. H. Rizvi, Sr. Scientist; Dr. S. P. Ahlawat, Sr. Scientist and Dr. V. K. Gupta Pr. Scientist of the Centre have been awarded the prestigious Brandis Prize 2009 for valuable contribution in the Indian Forester**,** ICFRE, Dehradun.

- Dr. S.P. Ahlawat, Sr. Scientist participated in National Symposium on "Integrated Farming Systems for Sustainable Agriculture- Challenges and Opportunities (IFFSA-2011)" held at Institute of Agriculture. Sciences, Bundelkhand University, Jhansi from 19th to 21st February, 2011 and got Third prize in Oral Presentation.

HUMAN RESOURCE DEVELOPMENT

- Dr. R. H. Rizvi, Sr. Scientist participated in Geospatial World Forum 2011 held at Hyderabad during 18th to 21st January,2011. He personated a paper on "Analysis of Landuses Especially agroforestry in Saharanpur district of North –western India using Geospatial Technologies".

- dsUn ds Mkñ o`tsUnz dqekj xqIrk] Mkñ jekdkUr frokjh] MkW0 jktsUnz izlkn] iz/kku oSKkfud] Mkñ j?kquUnu izlkn f}osnh] Mkñ ,0 oSadVs"k] ofj'B oSKkfud] Mkñ jktho frokjh] Mkñ pUnzs"k dqekj oktis;h]ofj'B rdñ vf/kdkfj;ksa us jk'Vªh; d`f"k foKku laxks'Bh ¼21&23 tuojh] 2011½ esa Hkkx fy;kA

- Dr. S. K. Dhyani, Director; Dr. Rajendra Prasad; Dr. A.K. Handa, Pr. Scientists; Dr. Ajit, and Dr. R. H. Rizvi, Sr. Scientist of the Centre participated in Launch Workshop on 'National Initiative on Climate Resilient Agriculture' on 1st -2nd Feb.2011at New Delhi.

- Dr. R. K. Tewari, Pr. Scientist; Dr. R. S. Yadav, Dr. Ramesh Singh, Sr. Scientist and Dr. S. K. Dhyani, , Director participated in Workshop on "Success Stories in Watershed Management" Conducted by Department of Land Resources , MORD, GOI, New Delhi from 02nd to 03rd February,2011.

- Dr. R. K. Tewari, Pr. Scientist and Dr. Rajeev Tiwari, Sr. T.O. participated in Workshop on "Sensitization of RFD" organized by ICAR at New Delhi from 10th to 14th March,2011.

ICAR ZONAL SPORTS MEET

A contingent of 36 participants from the Centre participated in ICAR Zonal Sports Meet at IGFRI, Jhansi from 16th -19th February, 2011 and 2nd prize in cycle race.

VISITORS

- Hon'ble Sharad Pawar, Union Minister for Agriculture and Food Processing Industries, Govt of India, New Delhi.
- Hon'ble Pradeep Jain 'Aditya', Union State Minister for Rural Development, Govt of India, New Delhi.
- Hon'ble Dr S. Ayyappan, Secretary DARE and Director-General ICAR, New Delhi
- Dr P. K. Basu, Secretary Deptt of Agriculture & Cooperation, Govt of India, New Delhi
- Dr A.K. Singh, Deputy Director General (NRM) ICAR, New Delhi
- Dr S. K. Datta, Deputy Director General (Crop Sciences), ICAR, New Delhi.