



BRAINSTORMING WORKSHOP

ON

**STRATEGY FOR CONSERVATION AND
PRODUCTIVITY ENHANCEMENT OF FARM
ANIMAL GENETIC RESOURCES**

PROCEEDINGS

NASC Complex, New Delhi-110 012

10th January, 2014

Organized By

Indian Council of Agricultural Research (ICAR), New Delhi, India
Trust for Advancement of Agricultural Sciences (TAAS), New Delhi, India
Department of Animal Husbandry, Dairying & Fisheries, New Delhi, India

CHIEF PATRON

Shri Sharad Pawar

Hon'ble Union Minister for Agriculture
and Food Processing Industries

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Director General, ICAR, New Delhi

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Dr. Arjava Sharma

Director, NBAGR, Karnal

JOINT ORGANIZING SECRETARY

Dr. Vineet Bhasin

Pr. Scientist (AG&B), ICAR, New Delhi

Friday, 10 January 2014

**Venue:
A. P. Shinde Symposium Hall
NASC Complex, DPS Marg, New Delhi**

09:00-09:30	Registration
09:30-10:30	Inaugural Session

Time	Activity	
09:30-09:40	Welcome Address	Dr. Arjava Sharma Director, NBAGR & Organizing Secretary
09:40-09:50	Background and Theme of the Workshop	Prof. K.M.L. Pathak DDG (AS) & Chairman, Organizing Committee
09:50-10:00	Address by Chairman, TAAS and Chairman, Haryana Kisan Ayog (HKA)	Dr. R.S. Paroda
10:00-10:10	Address by Secretary, DARE & DG, ICAR	Dr. S. Ayyappan
10:10-10:25	Address by Chief Guest	Shri Anup Kumar Thakur Secretary, DAHD&F, Govt of India
10:25-10:30	Vote of Thanks	Dr. N.N. Singh Secretary, TAAS
10:30-11:00	Tea and Group Photograph	

11.00 – 13:30 Technical Session I : Conservation Strategies

Chairman : Dr. R.S. Paroda, Chairman, TAAS and Chairman, HKA
Panelists : Dr. V.K. Taneja, Vice-Chancellor, GADVASU, Ludhiana (Punjab)
Dr. R.M. Acharya, Former DDG(AS)

Time	Topic	Speaker
11:30-12:00	Conservation Strategies for Genetic Resources of Large Ruminants	Dr. Arjava Sharma Director, NBAGR, Karnal
12:00-12:30	Conservation Strategies for Genetic Resources of Small Ruminants	Dr. S.K. Singh Principal Scientist, CIRG, Makhdoom
12:30-13:30	Open house discussion	
13:30	LUNCH	

14.30 – 16:10 Technical Session II : Breeding Programme Strategies

Chairman : Dr. S. Ayyappan, Secretary, DARE & DG, ICAR
Panelists : Dr. P.N. Bhat, Former DDG(AS)
Dr. P. Thangaraju, Former VC, TANUVAS

Time	Topic	Speaker
14:30-15:00	Breeding Strategy for Productivity Enhancement of Large Ruminants	Dr. P.K. Singh Principal Scientist, NBAGR, Karnal
15:00-15:30	Breeding Strategy for Productivity Enhancement of Small Ruminants	Dr. Chanda Nimbkar Director, Animal Husbandry Division NARI, Phaltan, Maharashtra
15:30-16:10	Open house discussion	
16:10-16:30	TEA	

16.30 – 18:00 Wrap-up

Chairperson : Dr. R.S. Paroda, Chairman, TAAS and Chairman, HKA

Chairperson : Dr. S. Ayyappan, Secretary (DARE) & DG, ICAR

Time	Activity	
16:30-17:00	Overall Recommendations	Prof. K.M.L. Pathak DDG(AS)
17:00-17:20	The Way Forward	Dr. R.S. Paroda Chairman, TAAS and Chairman HKA
17:20-17:40	Concluding Remarks	Dr. S. Ayyappan Secretary (DARE) & DG, ICAR
17:40	Vote of Thanks	Dr. Arjava Sharma Director, NBAGR & Organizing Secretary



INDIAN COUNCIL OF AGRICULTURAL RESEARCH (ICAR)

ICAR is an autonomous organisation under the Department of Agricultural Research and Education (DARE), Ministry of Agriculture, Government of India. Formerly known as Imperial Council of Agricultural Research, it was established on 16 July 1929 as a registered society under the Societies Registration Act, 1860 in pursuance of the report of the Royal Commission on Agriculture. The ICAR has its headquarters at New Delhi. The Council is the apex body for co-coordinating, guiding and managing research and education in agriculture including horticulture, fisheries and animal sciences in the entire country. With large number of ICAR institutes and agricultural/veterinary universities spread across the country, this is one of the largest national agricultural research and education systems in the world. The ICAR has played a pioneering role in ushering Green Revolution and subsequent developments in agriculture in India through its research and technology development that has enabled the country to increase the production of food-grains, horticultural crops, marine and inland fish, milk and eggs, thus making a visible impact on the national food and nutritional security. It has also played a major role in promoting excellence in higher education in agriculture. It is engaged in cutting edge areas of science and technology development and its scientists are internationally acknowledged in their fields. For details, please visit: www.icar.org.in.



TRUST FOR ADVANCEMENT OF AGRICULTURAL SCIENCES (TAAS)

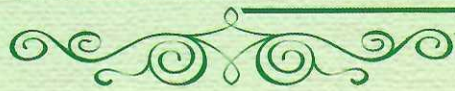
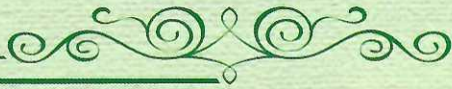
TAAS came into existence as a follow up action of the 88th session of Indian Science Congress organized at Indian Agricultural Research Institute, New Delhi in January 2001 under the presidentship of Dr. R. S. Paroda. This was the first Congress of the New Millennium with the theme of "Food, Nutrition and Environmental Security". The vision statement "Hunger free India is an idea whose time has come. Let us launch a science-based crusade for elimination of hidden hunger and malnutrition". During the congress, the then Prime Minister of India exhorted the scientists by saying "Our goal is to make India a leading nation in the world in the new century hinging critically on how successfully we take science to the people and create a stronger scientific

temper in our society". In response to the above, and considering the fact that the congress should not be seen as an end in itself, a movement for harnessing, in particular, the agricultural sciences for the welfare of the people, the National Organising Committee decided to form a Trust for Advancement of Agricultural Sciences (TAAS). The Trust was established on 17 October 2002. For details, please visit: www.taas.org.in.



DEPARTMENT OF ANIMAL HUSBANDRY DAIRYING & FISHERIES (DAHD&F)

DAHD&F is responsible for matters relating to livestock production, preservation, protection and improvement of stocks, dairy development and also for matters relating to the Delhi Milk Scheme and the National Dairy Development Board. It also looks after all matters pertaining to fishing and fisheries Development Board. The Department advises the State Governments/ Union Territories in the formulation Policies and programmes in the field of animal husbandry, dairy development and fisheries. The main focus of the activities is on Development of requisite infrastructure in States/UTs for improving animal productivity; Preservation and protection of livestock through provision of health care; Strengthening of central livestock farms (Cattle, Sheep and Poultry) for development of superior germplasm for distribution to states; and Expansion of aquaculture in fresh, brackish water, welfare of fisher-folk, etc. For details, please visit: www.dahd.nic.in.







BACKGROUND

Animal husbandry is an integral component of Indian agriculture supporting livelihood of more than two-third of the rural population. Livestock and poultry products provide nutritious food (milk, egg and meat), draught power, fuel, wool, fibre, manure, hides & skin, etc. This sector also offers income-generating opportunities through self employment. Farm animal genetic resources in India are represented by 144 registered breeds of livestock and poultry which include 37 breeds of cattle, 13 of buffalo, 39 of sheep, 23 of goat, 6 of horse and ponies, 8 of camel, 2 of pig, 1 of donkey and 15 of poultry in addition to many more populations of other species like mule, yak, mithun, duck, quail, etc. which are yet to be classified and registered.

Small scale livestock keepers and pastoralists have developed animal breeds/populations over centuries that suited to their production system. These breeds had unique qualities of tolerance to abiotic and biotic stresses and were deeply integrated with their economy, cultural values and knowledge system. However, intensive livestock production has promoted use of a few specialized breeds with specific production traits. This process has resulted into loss of genetic variability, as native breeds and species are being neglected in response to market demands. Declining livestock diversity also has adverse affects on our capacity to mitigate the enormous challenges posed by climate change as well as emerging diseases. We may need to rely back on the adaptability and potential of indigenous animal genetic resources to face an uncertain future. Although some programs have been initiated during the last two decades to arrest the decline in indigenous livestock and poultry wealth; still there are significant gaps in policy formulation, proper legislations, coordination among various agencies/stakeholders and proper execution of breed improvement and conservation programmes.

Considering the importance of issues related to breeding strategies and conservation of Indian farm animal genetic resources, a brainstorming workshop was jointly organized by Indian Council of Agricultural Research (ICAR), Department of Animal Husbandry, Dairying & Fisheries (DAHD&F), Government of India and Trust for Advancement of Agricultural Sciences (TAAS) in New Delhi on 10th January, 2014. The workshop was an interface between policy makers, researchers, field officers, NGOs, livestock keepers and experts in the field of animal breeding and conservation to formulate a roadmap for improvement and conservation of indigenous livestock in view of changing production systems and climate in the country as well as fast changing global scenario vis-à-vis IPR issues. Since breeding and conservation programs are state subjects, senior officers from Central and State Animal Husbandry Departments also participated in the workshop.

INAUGURAL SESSION

Dr. Arjava Sharma, Director, NBAGR, Karnal welcomed the dignitaries and delegates. Dr. K.M.L. Pathak, Deputy Director General (Animal Sciences) highlighted the theme of the workshop and emphasized the need of synergy among various inputs viz. quality genetic material, balanced nutrition and animal health for enhancing overall productivity of livestock in India. Dr. R.S. Paroda stressed on the formulation of National Action Plan so that the conservation and management of genetic resources become an integral part of the overall International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA). He emphasised that India is committed to develop national strategies for the conservation and sustainable utilization of its livestock and poultry genetic resources as per Interlaken Declaration (2007) on Global Plan of Action for Animal Genetic Resources. A joint effort earlier by TAAS and ICAR in 2009 had led to adoption of 'Ranchi Declaration' for conservation of our valuable genetic resources. Dr. S. Ayyappan underlined that a roadmap for conservation activities may be prepared and breeds should be prioritized based on their urgency and utility under changing climatic scenario. Shri Anup Kumar Thakur, in his inaugural address, gave an account of the conservation activities being initiated by the Department of Animal Husbandry, Dairying and Fisheries, Government of India. He stressed that more emphasis should be given for enhancing the productivity of indigenous breeds of cattle through selective breeding, improved feeding and management interventions rather than crossbreeding of well-defined indigenous cattle with exotic breeds. He assured that the Department will give due attention to the recommendations of this workshop. Dr. N. N. Singh, Secretary, TAAS, presented vote of thanks.

Technical Session I Conservation Strategies

Chairman: Dr. R. S. Paroda, Chairman, TAAS

Panelists: Dr. R. M. Acharya, Former Deputy Director General (AS), ICAR
Dr. V. K. Taneja, Vice-Chancellor, GADVASU, Ludhiana

Conservation is a multi-tier process which requires development and testing of different models for different species under different production systems. While *in situ* model is an ideal approach to conserve both large and small ruminants as this approach can sustainably utilize the resources in their ecological niches so that these are continuously evolved to produce in changing environment. However, the importance of *ex situ* approach cannot be ignored. Besides, an important aspect for conservation of farm genetic resources today is: "Is it worth it?" If yes, then next question comes how to prove economically that it is worth it. In order to review these aspects and to flag related issues, base papers for large and small ruminants were presented by Dr. Arjava

Sharma and Dr. S.K. Singh, Principal Scientist, CIRG, Makhdoom. While Dr. Sharma presented an account of reasons for decline of large ruminant populations and proposed conservation strategies as well as models for economic indexing of large ruminants, Dr. Singh presented an account of various conservation and improvement programmes being implemented for small ruminants. The session chairman Dr. R. S. Paroda and the panelists, Dr. V. K. Taneja and Dr. R. M. Acharya offered their comments on the subject. Dr. V. K. Taneja underlined the importance of changing climate as well as production system for chalking out long-term breed conservation/improvement programs. Government should undertake conservation activities considering future scenario in coming decades. Breeds should be evaluated on the basis of economic and adaption values. Dr. R. M. Acharya opined that use of few males over longer period in smaller herds has increased inbreeding resulting in deterioration of performance of indigenous breeds. Dr. R. S. Paroda while summing up the discussion emphasized that the linkages between State Animal Husbandry Departments (SAHDs) and ICAR need to be further strengthened to develop effective breed conservation programs in their breeding tracts. Priorities have to be identified in different directions and activities should be earmarked for each organization. Open house discussion on conservation strategies focused on having field level programs which should be implemented by the stakeholders like State Animal Husbandry Departments and the Livestock Keepers. A mechanism for providing incentives to livestock keepers should be developed. Establishing new farms should be critically evaluated and instead infrastructure available with NGOs/Goshalas may be effectively utilized. The breeds relevant today and in future should be taken up for conservation and improvement rather than diluting resources on all the breeds.

Technical Session II Breeding Programme Strategies

Chairman: Dr. Madappa Mahadevappa, Former Chairman, ASRB

Panelists: Dr. P. N. Bhat, Former Deputy Director General (AS), ICAR
Dr. P. Thangaraju, Former Vice-Chancellor, TANUVAS, Chennai

Traditional breeds are the outcome of breeding and selection process carried out by farmers continuously over many generations. These populations have high levels of genetic diversity and are naturally adapted to specific environments. Development and implementation of sustainable breeding strategies is a vital component for genetic improvement of these breeds as economically sustainable genetic resources. However, there are many bottlenecks in implementation aspects of breeding program like cost intensive field recording for sire evaluation, smaller herd size at organized farms and above all, non-availability of superior germplasm. In order to discuss these issues, base papers were presented by Dr. P. K. Singh, Principal Scientist, NBAGR, Karnal and Dr. Chanda

Nimbkar, Director, Animal Husbandry Division, NARI, Phaltan in which the speakers reviewed different breeding programs being undertaken in the country for the genetic improvement of large and small ruminants. A separate strategy for each production system should be formulated. The policy should have focus on production of superior breeding males and creation of breed associations. Chairman, Dr. M. Mahadevappa and the panellists Dr. P. N. Bhat and Dr. P. Thangaraju offered their comments followed by open house discussion. During the discussions, it emerged that enumeration of breeds should be taken up on priority and goshalas having significant number of animals of indigenous breeds should be part of the breed improvement programs. Non-descript populations should be crossed with improved breeds using performance tested sires. Private sector should be encouraged to enter livestock business. ICAR should initiate experiments to test adaptability of crossbreds, indigenous and exotic breeds. Specific traits in indigenous breeds should be established for improvement and conservation. Record keeping should be introduced for tractability and worldwide acceptance of animal products. Health and fertility traits should be included in selection criteria. Breeding for A2 β casein should be implemented in crossbreds. It was also suggested that feed/fodder production needs to be enhanced to meet the requirement of the livestock sector.

WRAP-UP SESSION

Chairman: Dr. R. S. Paroda, Chairman, TAAS
Dr. S. Ayyappan, Secretary DARE and
Director General, ICAR

Dr. Pathak presented the recommendations of both the sessions. Dr. Paroda emphasized that all the stakeholders should be involved in policy planning, development of National Action Plan and its implementation. He stated that a well-planned national strategy on animal genetic resources be executed in a Mission Mode approach. The role of NGOs, specially some Goshalas, is very important for the improvement and conservation as they have good rapport with livestock keepers. He further stressed that there is need to have a National Gene Fund for conservation of AnGR. Dr. S. Ayyappan proposed that each state should declare at least one livestock breed as 'STATE BREED'. He desired NBAGR to strengthen the Network Project on AnGR and propose more units for characterization and conservation of non-descript animal breeds.

After detailed discussion, the house unanimously agreed to the following key recommendations for conservation and productivity enhancement of indigenous farm animal genetic resources in India.

RECOMMENDATIONS

1. In view of existing rich diversity of livestock genetic resources, and considering the urgency for conservation and management of these valuable resources, a time bound National Action Plan must be finalized and put to action as a National priority.
2. To begin with, each State must at least identify and declare one livestock breed as "STATE BREED" in order to initiate required conservation and genetic improvement activities on priority by creating the best possible facilities and to ensure participation of all stakeholders.
3. A National Livestock Development Authority be established by DAHD&F specially for the breed conservation and management programs. The possible composition of the National Authority could be :
 - I. Secretary, DAHD&F - Chairman
 - II. Deputy Director General (Animal Sciences), ICAR
 - III. Director, NBAGR
 - IV. A few (3-4) Directors/Chief Executive Officers of SAHDs
 - V. Two representatives from NGOs/Goshalas
 - VI. Animal Husbandry Commissioner – Member Secretary
4. In order to protect the rights of Livestock Keepers and to ensure proper access and benefit sharing (ABS) of AnGR, a National Act on lines similar to that of Protection of Plant Variety & Farmers Rights Act (PPVFRA) should be framed jointly by NBAGR/ ICAR and DAHD&F for speedy Government approval.
5. A National Gene Fund linked to National Livestock Mission should be created soon by the DAHD&F so as to ensure effective implementation of specific breed conservation programs. In this context, efforts be directed to implement "Ranchi Declaration" as a national priority.
6. NBAGR must accelerate its pace for characterization, documentation and registration of different livestock and poultry strains/breeds by strengthening further the Network Project on Animal Genetic Resources, involving all relevant institutions / organizations and by assigning breed specific responsibilities.
7. An online Information System for management of data on animal genetic resources of the country should be developed at the National level and each state should identify a nodal officer responsible for regular updation of data, on pattern similar to that of "DAD-IS" model of FAO.

8. NBAGR, in collaboration with DAHD&F, should organize regular public awareness/sensitization programs in various States for understanding of the importance and utility of our available animal genetic resources in the country.
9. The State Animal Husbandry Departments (SAHDs) must ensure availability of semen of superior males/germplasm in sufficient quantity in order to implement the national breeding strategy.
10. All SAHDs need to promote the establishment of animal breed societies and initiate performance recording of important indigenous breeds at field level in order to ensure effective bull evaluation.
11. There is an urgent need to develop niche markets for breed specific value added products. This will help in better utilization, improvement and conservation of indigenous animal breeds.
12. Some of the Goshalas do hold sizable population and infrastructure, which could be used for genetic improvement of indigenous breeds as well as *in situ* conservation. For this, needed support by the Government and technical backstopping by the State Agricultural Universities (SAUs) and ICAR institutes must be extended.





