# Agro-climatic Region Centered Research and Development Planning

## (Central Plateau and Hill Region)

### Zones Covered

Bundelkhand, Baghelkhnad, Bhander Plateau, Malwa Plateau and Vindhyachal Hills

### Brainstorming jointly organized by

**ICAR-Agricultural Technology Application Research Institute** (ATARI), Kanpur and ICAR-Indian Grassland and Fodder Research Institute (IGFRI), Jhansi

### Held at

ICAR-Indian Grassland and Fodder Research Institute (IGFRI), Jhansi

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## Significance of Agro-climatic linked regional planning

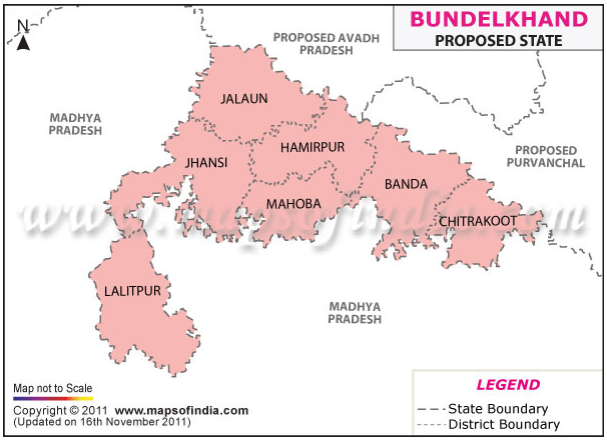
The Agro-Climatic Regional Planning aims at a more scientific utilization of natural and manmade resources available in the country. As a first step, the country is divided into 15 Regions delineated on the basis of agroclimatic factors such as soil type, rainfall, temperature, and water resources. An overall development profile of each region is formulated through an optimal mix of land stock management, crop production, animal husbandry, aquaculture, horticulture, forestry and agro-processing activities. At the disaggregated level, a farming system approach, rather than the traditional crop production approach, is attempted at. The objectives are to: (a) attempt a broad demand-supply balance of major commodities at the national level based on an analysis of potential and prospects of the several regions: (b) maximize net income of producers: (c) generate additional employment for the benefit, particularly, of landless labourers; and (d) in the long-run, provide the framework for a scientific and sustainable use of natural resources particularly land, water, and forests. The 15 regions so delineated arc: (1) Western Himalayan Region; (II) Eastern Himalayan Region; (III) Lower Gangetic Plains Region; (IV) Middle Gangetic Plains Region; (V) Upper Gangetic Plains Region; (VI) Trans-Gangetic Region; (VII) Eastern Plateau & Hills Region; (VIII) Central Plateau & Hills Region; (IX) Western Plateau and Hills Region; (X) Southern Plateau & Hills Region; (XI) East Coast Plains & Hills Region; (XII) West Coast Plains & Ghats Region; (XIII) Gujarat Plains & Hills Region; (XIV) Western Dry Region and (XV) The Islands Region.

## Central Plateau and Hills Agro-Climatic Regions of India: An overview

Central Plateau and Hills Region is a large region comprising 46 districts of Madhya Pradesh, Uttar Pradesh, and Rajasthan. It is sub-divided into 14 sub-regions having varied topography of low hills, mounds, valleys, and ravines. Nearly one-third of land is not available for cultivation. Climate is arid in western part to sub-humid in eastern part. Irrigation intensity and cropping intensity are low, and cropping is dominated by food crops. The undulating topography, underdeveloped irrigation potential, and large proportion of rainfed farming suggest water conservation, crop diversification, ground water development and input supplies and services to be main measures necessary for proper development and growth of the region.

This region spreads over Bundelkhand, Baghelkhand, Bhander plateau, Malwa plateau and Vindhyachal hills. The climate is semi-arid in western part to sub-humid in eastern part with temperature in July month 26°C-40°C, in January month 7°C-24°C and average annual rainfall from 50 cm- 100 cm. Soils are mixed red, yellow and black growing crops like millets, gram, barley, wheat, cotton, sunflower, etc. The region has dearth of water resources. The suggested measures should include water conservation through water saving devices like sprinklers and drip system; dry farming popularisation; dairy development, crop diversification, ground water development, diversion of 16 lakh ha of low value crops to high value crops, reclamation of ravine lands and improvement in indigenous breed cattle.

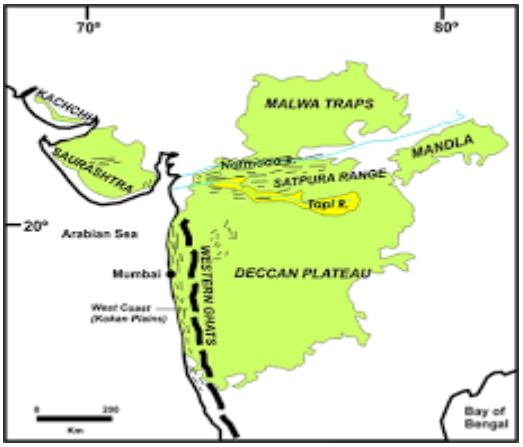
***Bundelkhand (Uttar Pradesh):*** Bundelkhand lies between the Yamuna and the Northern scarp of the Vindhyan plains. The agro climatic sub-zone Bundelkhand (Uttar Pradesh) includes five districts from South-central Uttar Pradesh, viz. Jalaun, Jhansi, Lalitpur, Hamirpur and Banda. It receives about 900 mm of rainfall. A little over 60% of the area is cultivated, but compared to other parts of Uttar Pradesh, the sub-zone has less developed irrigation facilities. Only about 25% of the cultivated area is irrigated as against a State average of nearly 60%. Soil erosion is high and land productivity is low.




***Bundelkhand (Madhya Pradesh):*** The proportion of wastelands is very high at about 37% in this sub-zone. Only about 45% of the land is cultivated; a little over a third of the cultivated area is irrigated. The sub-zone includes the districts of Datia, Chhatarpur and Tikamgarh. The area receives relatively low rainfall of around 700 mm annually, the climate is dry sub-humid and the soil type is classified as mixed red and black.

***North Hills:*** Also called Chhatisgarh Hills sub-zone, this consists of Mandla district. It receives relatively higher rainfall, about 1,570 mm per annum. Around 42% of the land is cultivated and a little over a third of it is irrigated. Tribal population is high.

***Kymore Plateau and Satpura Hills:*** This is a vertical strip running down central Madhya Pradesh including Sidhi, Rewa, Satna, Panna, Jabalpur and Seoni districts. The region has a relatively high proportion of waste and uncultivated lands—about 21%. Another about 22% of the land is under forest cover. Only 37% is cultivated. Irrigation facilities are very poor as only about ten per cent of the cultivated land is irrigated.




***Vindhya Plateau:*** This is a cluster of six districts—Sehore, Raisen, Bhopal, Vidisha, Sagar and Damoh—located in central Madhya Pradesh. This region is more urbanised and has a larger portion of its area under cultivation as compare to the rest of the zone. 53% of the area is cultivated, however, only 11% of this is irrigated. The region receives about 1,130 mm of rains annually. From the state of UP, two districts namely Mirzapur and Sonebhadra belong to this zone.

***General Topography of the Zone:*** In Madhya Pradesh (MP), in Kymore plateau sub-zone, the topography is undulated and sloppy; in Vindhyachal Plateau sub-zone, it is plain to undulated; in Central Narmada Valley sub-zone, it is plain; in Gird region, it is plain to undulated; in Bundelkhand region, it is plain with small hillock (5% slope) while in Satpura Plateau sub-zone, it is plain to undulated.

## Detailed Description of Bundelkhand region of UP and MP

The region covers a geographical area of around 70,000 sq km and comprises 13 districts includes seven districts of Uttar Pradesh (Jhansi, Lalitpur, Jalaun, Hamirpur, Mahoba, Banda and Chitrakoot) and six districts of Madhya

Pradesh (Datia, Tikamgarh, Chhatarpur, Panna, Sagar and Damoh). The names of the districts falling under different zones in this region in the states of Uttar Pradesh and Madhya Pradesh are given below in table 1:

**Table 1: State-wise distribution of Central Plateau and Hills Agro-Climatic Regions of Uttar Pradesh and Madhya Pradesh**

| Sl. No. | States | Name of districts |
|---|---|---|
| 1 | Bundelkhand (Uttar Pradesh) | Jalaun, Jhansi, Lalitpur, Chitrakoot, Lalitpur,Hamirpur and Banda |
| 2 | Bundelkhand (Madhya Pradesh): | Datia, Tikamgarh, Chhatarpur, Panna, Sagar, and Damoh |
| 3 | North Hills | Mandla |
| 4 | Kymore Plateau and Satpura Hills | Sidhi, Rewa, Satna, Panna, Jabalpur and Seoni |
| 5 | Vindhya Plateau | Sehore, Raisen, Bhopal, Vidisha, Sagar, Damoh, Mirzapur and Sonebhadra |

Bundelkhand means "Bundela domain". According to the inscriptions of the Chandela dynasty, this name derived from Jeja, the nickname of their ruler Jayashakti. However, it is possible that this name derives from an even earlier name of the region "Jajhauti" or "Jijhoti". After the Bundelas replaced the Chandelas around 14th century, the region came to be known as Bundelkhand. In 1931 Bagelkhand Agency, with the exception of the state of Rewa, was merged into Bundelkhand Agency. Prior to 1947, however, the name was restricted politically to the princely states of the Bundelkhand Agency, created in 1802 as a sub-agency of the British Central India Agency.In 1948 Baghelkhand and Bundelkhand merged into Vindhya Pradesh, which with several former enclaves of southern Uttar Pradesh merged with Madhya Pradesh in 1956. Since the early 1960s there has been a movement for establishing a Bundelkhand state. In spite of being rich in minerals, the people of Bundelkhand are very poor and the region is underdeveloped and underrepresented in state and central politics. Agrarian crisis and farmer's suicides are also cited as reason for separate statehood. Currently the area is economically and industrially one of the most backward areas in India. Lack of resources, poor communications, and infertile land are some of the reasons for underdevelopment in the region.

***Geography of Bundelkhand:*** Bundelkhand lies between the Indo-Gangetic Plain to the north and the Vindhya Range to the south. It is a gently sloping upland, distinguished by barren hilly terrain with sparse vegetation, although it was historically forested. The plains of Bundelkhand are intersected by three mountain ranges, the Vindhya, Fauna and Bander chains, the highest elevation not exceeding 600 meters above sea-level. Beyond these ranges the country is further diversified by isolated hills rising abruptly from a common level, and presenting from their steep and nearly inaccessible scarps eligible sites for forts and strongholds of local kings. The principal rivers are the Sindh, Betwa, Shahzad River, Ken, Bagahin, Tons, Pahuj, Dhasanand Chambal. The Kali Sindh, rising in Malwa, marks the western frontier of Bundelkhand. Parallel to this river, but further east, is the course of the Betwa. The Yamuna and the Ken are the only two navigable rivers. Notwithstanding the large number of streams, the depression of their channels and height of their banks render them for the most part unsuitable for the purposes of irrigation, which is conducted by means of ponds and tanks.

***Climate:*** Bundelkhand is a hot and semi-humid region. Minimum temperature varies from around 6°C in Chhatarpur to 12°C in Sagar. Maximum temperature varies from 38° C in Sagar to 43°C in Banda. Generally hottest days are in May and coldest days in December or January. Actual local temperatures are much higher, due to local conditions such as lack of fog and radiation from rocky soils or outcrops. Banda is one of the hottest places in India, and several people die of sunstroke here every year. The cloud of dust can be so thick that it becomes dark even during the day.

***Geological:*** Geologically, Bundelkhand presents a mixture from different eras, from the earliest days of the formation of the earth, when its upper crust cooled and solidified, till recent times. From the earliest period, older than 2500 million years, are granite-like formations called gneiss and so-called Bundelkhand Granite. Much of the area of Datia, Jhansi, Lalitpur, Tikamgarh, Chhatarpur, Panna and Sagar districts, and southern portions of Chitrakoot and Mahoba districts is granite country, marked by outcrops of great diversity in mineral composition and size, ranging from small patches to large hillocks. Often, these wall-like natural features intercept the course of streams, leading

to formation of water bodies and enabling the creation of large artificial lakes. From later geological eras (570 to 900 million years ago), diamond fields in Panna, extensive limestone deposits in Damoh, Chhatarpur and Datia, basaltic rocks in southern Lalitpur and sandstone deposits in Panna and Sagar. Massive sandstone and limestone cliffs are seen in the Vindhyan hills which girdle the granite country. The most recent geological deposits are alluvium, in the form of sand, silt or clay, brought down by north-flowing rivers.

***Demographical :*** Bundelkhand has a total population of around 18.3 million (Census 2011), out of which approx 79.1% population lives in rural area. The poverty situation in the region has also become extremely critical in the recent years. This is because of lack of employment and lack of opportunities. The largest population was found in Sagar district (20.2 lakhs) and lowest population was found in Datia district (6.2 lakhs) of M P Part of Bundelkhand. While in Chitrakoot district, less than 10% of the population resided in urban areas. There is a clear variation in intra-regional distribution of population. There is higher population density in the Bundelkhand Plain areas (particularly in Jalaun and Banda), and Bundelkhand Intermediate region areas (particularly in Jhansi and Tikamgarh), and lower population density in Bundelkhand Upland (particularly in Panna and Chhatarpur) and the southern Damoh and Sagar plateaus. However, in recent decades Bundelkhand has witnessed high population growth, as can be seen from population growth trends.

***Ecological:*** Bundelkhand region is one of the poorest regions not only in Uttar Pradesh (UP) and Madhya Pradesh (MP) but all of India. Agriculture is the biggest occupation in rural India. A small section of the rural population depend upon non-agricultural occupations such as carpentry, pottery, basket making etc for their livelihood but these occupations are also indirectly related to the major occupation that is agriculture. Agriculture is the fundamental occupation of the rural people and forms the basis of rural economy. Normal rainy days in Bundelkhand is 52 days (metrological department of India) but during recent years its restricted 24 days. An average precipitation is 800-900 mm but the occurrence and distribution has no any definite pattern resulted farmers were not prepared for sowing and all most every years they faced the problem of drought even though during good rainfall year. Agricultural crops

or other various livelihoods such as fishing, vegetable production and traditional betel leaf farming are facing one of the worst crises ever. Falling in agricultural production subsidiary occupation as animal raring also affected and productivity goes down bellow economic level. UP Bundelkhand is predominantly a pulses-growing country, especially when viewed against the UP average for land under cultivation of this category of crops. In MP Bundelkhand, there is more equal distribution of land under cereals and millets, and pulses, but here too area under the former category of crop has come down in almost the same proportion as in UP Bundelkhand. A significant difference in cropping pattern in the two Bundelkhands is the area under oilseed cultivation: as percentage of total cropped area, oilseed cultivation in MP Bundelkhand is three times the UP Bundelkhand average, though much lower than the MP average.

**Enriched tradition of resource use:** The entire Bundelkhand is situated in Vindhyan hills and ravines, catchment of Betwa, Yamuna.Various irrigation dams are built on these rivers for irrigating the otherwise dry district. The famous Rajghat, Matatila, Govindsagar, Parichha, SukuwanDukuwan and Panhuj, irrigations dams are situated in the Bundelkhand area. The Bundelkhand is in arid zone, and agriculture depends upon monsoon. There are irrigation dams made in the recent past, which provide water for irrigation. *Kharif* crop is purely based on rains. Peas, peanuts, tilli, Chana, Maize, Urad, Moong, Bajra are the major crop with Wheat in irrigated areas. Uncontrolled grazing by stray cattle (Anna pratha) is the major problem of the area. The wells become a part of Bundelkhand culture as these were considered holy places. Looking at the village's one can clearly see that on an average, 15-20 drinking water-wells and at least one pond are present in each village. Of course, the caste-culture had vitiated the atmosphere in certain villages where the Harijan community-members were not allowed to use tile wells at certain locations. But this tendency which had historical roots in the mediaeval age is fast disappearing. Moreover, many wells were constructed later in the Harijan localities which solved the problem to some extent. Feudal atmosphere due to improper education and lack of land reforms coupled with political blackmail have been the major causes of caste-tension in the rural society. This could be removed only by putting more emphasis on social and educational inputs and

making people aware of the real political process. The ancient people of Bundelkhand aided by the then *Chandela-and Bundela*kings tapped many streams and the sloping topography of the region by building embankments on the downstream sides to create big lakes and surface-reservoirs. Each village in almost all the districts of Buncdelkhand had developed a culture of creating ponds/tanks to help the inhabitants for meeting their domestic water needs The old and new tanks also played an important role in expanding the irrigation. In spite of their major share, these tanks were allowed todecay and disappear.The lakes, ponds, masonry wells and the *bavdi*all have been left uncared.

***Agricultural Scenario:*** The traditional farmers of Bundelkhand are being lured to adopt growing of cash crops using technology intensive, multiple irrigation and hybrid seed-based farming. Soybean has been largely promoted in these districts, which has replaced many of the coarse cereals, pulses arid oil seeds and helped towards growth of soybean processing industries. In the name of 'scientific' agriculture, monocropping was promoted and people in many areas turned to the crops of Masoor and Mustard instead of food-grains, coarse or fine. This affected employment of the seasonal agricultural labourers who now felt bound to migrate to Delhi or Punjab. Invasion of Soybean disturbed the whole food-chain and also the land and water situation. There is hardly any effort to plan agriculture which could suit the soils and help share equitably the available water resources and generate a sustainable farming system. The dryness in summer season affects the vegetation, as well as the animal husbandry of the villages. The cattle are let free to discover by themselves their means of survival. Such a tradition is suicidal these days because the vegetation has become scarce. Nowadays during the ANNA-period, many of tile cattle die or move out and get lost to the distant areas. Government of Madhya Pradesh has heavily subsidized electrical power for the farmer using upto 5 h .p. motors for pumping water and/or other agricultural operations. This has led to the installation of large numbers of pumping sets on each river-bank lifting out the precious water for wheat-rice crops affecting on the one hand the perennial flows of these streams and on the other the production of coarse cereals and other food stuffs. Lack of water in rivers and streams duringpost-monsoon period coupled with hot winds and dust storms create withering of

the soils, affecting the micro-organisms and the earth worms. Lifting of the water and its use in technology intensive agriculture gives profits to a few well-to-do farmers while the loss has to be shared by large numbers of small farmers and people of that region.

## Major agrarian problem of Bundelkhand

In Bundelkhand a small section of the rural population depends upon non-agricultural occupations for their livelihood but these occupations are also indirectly related to the Agriculture. Farmers of the villages perform various agricultural activities for which they need the cooperation of other members of the villages. Besides the several government programme for community development of the region still the population in the rural areas are poor, live in scarcity and prone to migration. People of the marginalized community of Bundelkhand are now starving from hunger and are migrating from rural areas. Animal health and production of these villages are very poor. Communities are not much aware of different developmental programme especially in agriculture because of socially, economically and educationally backwardness of society. In nutshell, there are several long term structural problems in the course of development in the region which have cumulative effect and adversely affect the livelihood of majority of population.

Similar to human being of the Bundelkhand animals are also in poor health and productivity. The horrifying experience in Bundelkhand is now wheat and cattle fodder is to be purchased on same price. Fodder crisis has also been pushed by the disturbing environmental cycle. The impact of climate change is evidently visible in Bundelkhand region. Climate change has hit the agriculture based livelihoods and food grain production in the Bundelkhand districts has decreased by 58%, it is very serious for the agriculture based society and economy. The land and people of Bundelkhand are facing the crisis of drought continuously for past 4 to 5 years.

## Methodology adopted

A one day workshop was jointly organized by ICAR-IGFRI Jhansi in partnership with ICAR-ATARI Kanpur at ICAR-IJFRI, Jhansi on 30/11/2015 to discuss the various issues related to agricultural development in the Central

plateau & Hill region of parts of Uttar Pradesh and Madhya Pradesh. This was in compliance with the Prime Minister's office (PMO) memorandum ID no 100/29/C/1/2015-ES 2, dated 11 August, 2015 with subsequent instruction vide ICAR letter no. DO no 26 (4)/2015-cdn(Tech), dated-19 August, 2015(attached as Annexure I).

The workshop was Chaired by Dr. J S Sandhu, DDG(CS), ICAR New Delhi and was attended by Directors of ICAR-IIPR, Kanpur; ICAR-ATARI, Kanpur; ICAR-DWR, Jabalpur; ICAR-CAFRI, Jhansi & the representatives from ICAR-DSR Indore; ICAR-CIAE, Bhopal; Heads of the selected KVK's representing Bundelkhand region & Vindhyan region of Uttar Pradesh & Madhya Pradesh as well as the officials from line departments, National Seed Cooperation NGO's & Farmers, farm women and youth from the nearby areas. The details of participants are enlisted as Annexure-III.

## Initial Observations


At the outset the participants were welcomed by Dr P K Ghosh Director ICAR-IGFRI Jhansi. In his address Dr. Ghosh stated that Central Plateau & Hill Region broadly includes five zones namely, Bundelkhand, Baghelkhand, Ruhelkhand, Vindhyan region & Malwa Plateau which are distinctively characterized by having 65% population dependent on agriculture, one third of population falling below poverty line & alarming rate of unemployment. Though, there had been various efforts in past for development of this region through various packages by Central & State Governments, but the impact of these efforts were not discernible in this region. Dr. Ghosh further highlighted that probably these efforts were executed in isolation and the elements of convergence among them was missing. Therefore, this workshop

according to Dr. Ghosh envisaged the participation of all stakeholders like farmers, KVK Scientists, ICAR Scientists, Development officials and NGO's.

In the introductory remarks, the Chairman of the workshop Dr. J S Sandhu, DDG(CS), ICAR New Delhi reiterated the conviction and vision of Hon'ble Prime Minister of India to hold such kind of workshop across the all fifteen Agro Climatic Zones of India wherein the dialogue andinteraction among all the stakeholders of agricultural developments may take place and through the concerted brainstorming, a road map indicating the action points for the development of agriculture and the allied sector for this region may be devised. Dr Sandhu stressed on listening to the participating farmers at first glance followed by KVK scientists and then development officials & the researchers in that order.


Dr. U S Gautam Director ICAR-ATARI Kanpur made a focussed presentation on Geo-demographical, climatic and agricultural development related issues in the Bundelkhand & Vindhyan region. He touched upon the historical perspective of the region wherein the bottlenecks & opportunities in agricultural and allied activities prevailed simultaneously. He also stated that the contribution of this region in total food grain has substantially reduced from 15% to 7% during last 10 years which may be attributed to various climate related factors, infrastructure related, supply and service related & extension related problems. Based on the current scenario in the region he pinpointed the areas for immediate(short term) and long term planning for sustainable agricultural development in the region with the sector wise prioritization as well as the revisiting the already identified and documented potential thrust areas for the region.

## Participants' View points

After this, the group of participating farmers from various development blocks and districts of Bundelkhand presented their view points of the issues related to agricultural developments. The most frequently expressed issues by these farmers were related to management of water (irrigation), management of soil, issues related to power supply and livestock development related issues. More objectively, farmers expressed that the power supply for smaller wattage (2 to 3 KW) has been stopped by the Government and instead 7KW power supply is being allotted which is charging heavily to the farmers. Therefore it was suggested to have appropriate roaster of power supply for irrigation of their crops. In order to mitigate the problem of irrigation of water & constantly declined underground water in the region, farmers also suggested that there is need to renovate the old ponds (small & large) and their rigorous desilting so that the traditional wells may get recharged & irrigation problem may be surmounted. Similarly it was also viewed by the farmers that the scheme for digging pond under MNAREGA, on one acre area should be restarted for large farmers instead of the small and marginal farmers for whom only the scheme is currently operational and practically it is not feasible for them to do so. Some of the farmers also opined that state Government scheme on fisheries is faulty designed at it targets only the small farmers who usually do not have minimum 1 acre area to be spared for developing it as a pond for fish farming and the large farmers are usually kept beyond the scope of this scheme. Thus the programme on fisheries in this region is gross failure which needs serious attention. Farmers also shared their views on how to mitigate the problem of *ANNA-PRATHA i.e.* leaving the animal herds free for grazing during kharif and summer season.

They suggested that if the non-descript breed of cattle are upgraded through appropriate breed improvement programme, the tendency to make the animals free for grazing shall stop. Farmers also suggested that there should be provision of goshalas for holding such animal and utilizing there byproducts (dung & urine) for crop production purpose. Another important issue highlighted by the farmers was related to price fixation mechanism for their farm produce. Farmers stated that unlike the industrial produces where producers have the say in fixing the price, fixation of agricultural produce are mostly through auction by middle men. This system not only fetches non-remunerative prices for their farm produces but also strikes on their emotional chord for treating them as second grade. Farmers also express their concern on faulty system of crop cutting by the insurance agencies and agricultural officials which renders them as non-beneficiary of insurance against crop losses due to untoward weather situations and despite their timely payment of insurance premium. Apart from these issues, farmers also raised the following points as the matter of concern.

- Need for focus on supplementary small enterprises like beekeeping, backyard poultry, small dairy units which may add to farmer's income and may be the insurance against natural calamities.
- Ensuring quality seeds of improved crop varieties on time.
- Systematic promotion of fodder cultivation.
- Capacity building of farmers for production and marketing of value added products from fruits, traditional cereals and pulses.
- Smoothening the process for schemes on barbed fencing of field crops and orchards. The possibility of cost sharing for such scheme may be explored.
- The currently stopped 90% subsidy on micro-irrigation system like drip & sprinkler need to be continued which may be instrumental in saving irrigation water, suitable for undulated land of this region and appropriate for low water requiring crops like pulses.
- Strengthening the village level milk collection & processing centers.

- Promoting farm forestry along with crop cultivation.

## KVKs' Viewpoints

In this workshop Heads of the KVKs from the districts of Jhansi, Jalaun, Lalitpur, Banda, Mahoba, Hamirpur, Chitrakoot & Etawah from Uttar Pradesh and Datia from Madhya Pradesh representing Bundelkhand and Vindhyayan regions participated in the discussion.

They suggested for re-standardizing the package of practices for different field crops in the light of changing climatic condition. Also for efficient management of irrigation water farmers needs to made aware of most critical stages of crop for application of irrigation. They also expressed as the climatic and edaphic factors are mostly suitable for pulses (Lentil, Chick pea & Field pea) & oilseeds (Sesame and linseed), the more water requiring crops like wheat, menthe, paddy etc may be promoted on limited extent. Apart from major nutrient of soil there is need to focus on organic carbon, sulpher and other micro nutrients for management of clay and sandy clay soils in the region. KVK Scientists also expressed the need for concerted efforts for management of weeds in kharif as well as rabi crops through suitable post emergence weedicides. Similarly the huge livestock population needs to be seen as opportunity for this region and they may be upgraded through improved indigenous cattle and buffalo breeds for enhanced milk production.

The hitherto popularized barbari breed of goat in this region should be restricted as this breed is suitable for stall feeding and disease susceptible in this climatic condition. Instead the Lalitpuri breed and other local breeds of goat need to be identified,

improved & promoted. There is tremendous scope for locally adapted traditional wheat variety-*Kathia*that needs attention. Also the promotion of minor millets (crop as well as value added products), spices, medicinal herbs, forest plants (mahua), *chiraunji*, value added products from vegetables required focused promotion. KVK Scientists also opined that the natural ponds getting extinct in the region need to be revived for their utilization in crop irrigation as well as fish production. The crop production also need to be diversified the suitable fruit crops like aonla, ber and guava. Promoting Poultry & piggery hold the potential for agricultural development in the region.

## Other Stakeholders' Viewpoints

The officials from NGOs, NABARD, National Seed Corporation, etc highlighted following issues demanding attention:

i. Ensured availability and accessibility of quality seed on time and adequately
ii. Promotion of micro-irrigation systems
iii. Promotion of horticultural and medicinal crops.
iv. Castration of stray bulls
v. Kharif crops may be promoted at equal scale of rabi.
vi. Need to develop a regional seed center of NSC and other agencies exclusively for this region

## Researchers' Viewpoints

Research scientists from various ICAR institutes in this region namely CIAE, Bhopal; DSR, Indor; DWR, Jabalpur; IIPR, Kanpur and CAFRI, Jhansi also shared their views for agricultural development of the region. Some of the important them were:

i. Custom hiring of large farm implements needs to be promoted by the development departments.
ii. Fabrication and manufacturing of small and medium sized farm implements may be encouraged.
iii. Crop variety expansion may be done through developing the varietal cafeteria at the KVK level.
iv. Hazardous and obnoxious weed like parthenium may be eradicated from the region through mission mode approach through manual, chemical and biological methods.

v. Kind, dose, timing and methods of application of weedicides and other plant protection chemicals need to be carefully considered by the farmers and extension officials.

vi. For rainfed condition, pulses need to be the only option and the mixed and inter-cropping in pulses may be promoted as an insurance against climatic aberrations. Fieldpea has emerged as the potential pulse crop in the region which needs promotion by state agricultural departments. Also, instead of use of chemical fertilizers, more application of bio-fertilizers, seed priming, seed treatment, judicious water use and bio-control of insect and pests need attention. A district-wise contingency plan should be ready in anticipation of any climatic emergencies.

vii. Management of natural resources through watershed approaches is need of the hour for this region.

## Issues emanated

Based on the above deliberationspertinentissues related to agricultural development in the Bundelkhand and Vindhyayan regions were identified which are delineated as below:

### i. Issue of irrigation management:

Managing the surface and underground water from canal as well as tube well and traditional well for irrigation of crop was identified as the important issue.

- Under the changing climatic regime, the water strata are constantly declining and also because of poor rainfall scenario in last couple of years sufficient precipitation are not available to recharge the canal, wells and tube well.
- Moreover, the existing policy of power supply by the state government are also cost intensive as it supplies 7 KW of power as against the required 2-4 KW connections.
- The Government scheme for subsidy on micro-irrigation (sprinkler and drip) has been withdrawn which is also become the hindering factor in utilizing by the small and medium farmers.

### ii. Issues related to quality seeds:

- Non-availability and poor accessibility of farmers to the quality seeds adequately and timely for the pulses as well as wheat, mustard and paddy crop is critical issue behind poor crop productivity.'

- The new system devised by the state agricultural department for on-line booking of seed has been proved less successful in want poor ICT literacy among farmers and thereby dominance of middlemen in this process.
- Each KVK in the region need to have variety cafeteria for different crops in a given season.
- Developing the seed hub for pulses in the region by the KVKs and simultaneously promoting informal seed production and farmer to farmer horizontal expansion to be given attention.
- Need to develop a regional seed center of NSC and other agencies exclusively for this region

### iii. Issue of livestock management:

The Bundelkhand has very large population of indigenous and very poor yielding cattle. The average yield of these cattle ranges from as paltry as 0.5 kg to 1.5 kg per cattle per day.

- The cattle holding areusually 4-10 adult bovine/household in the region. As the stall feeding cost is very high for such a large yet poor productive herd, farmer usually resort to make them free for grazing during rainy and summer seasons.
- Therefore, the large bovine population in the region needs to be considered as the opportunity and systematic breed improvement programme through upgrading and cross breeding on selective basis may be implemented.
- State Government sponsored AI centers are running non-functional in the region and there is tremendous load on private agencies like BAIF.
- The issue of developing rural youth as paravets was also realized.
- Timely and seasonal vaccination of livestock and castration of stray bulls are other critical issues in effective livestock management in the region.
- Small livestock like goat rearing and backyard poultry are another income generating options for the farmers of the region. Local lalitpuri breed of goat need to be systematically improved and popularized instead of other breeds which cannot adapt to the existing climate of the region.
- There is need to develop goshalas for holding back the stray animals and utilizing there byproducts (dung & urine) for crop production purpose.

### iv. Issue related to fish farming

Fisheries are the potential area for the farmers of the region to fetch ensured income. Though state Government has the scheme on fisheries but it has been designed in faulty style. This scheme targets only the small farmers with provision of digging fish pond but not less than an acre area. These farmers usually don not have enough land holding to spare one acre area for fish pond and the large farmers on the other hand who can afford the scheme are kept out of the provisions. Thus the programme on fisheries in this region is gross failure which is a serious issue.

### v. Issues related to processing and value addition

There is strong need to promote following:

- Provision of village level mini processing unit of milk and to prepare value added products.
- Building farmers' capacity for making value added products of pulses and also processing the raw pulses to Dal through group operated mini dal mills.
- Making processed products from the adapted fruits like aonla, guava and bel.
- There is tremendous scope for making value added products like dalia, suzi, etc. out of locally adapted traditional wheat variety-*Kathia* which is gaining popularity in metro cities.
- Also promotion of minor millets products like bajrabiscuits, powder, etc. may be promoted for income enhancement and employment generation.
- Also, production and processing of spices, medicinal herbs, forest plants (mahua), *chiraunji,* making the value added products from vegetables like tomatoes, etcrequire focused promotion.

### vi. Issues related to Crop management

- As the climatic and edaphic factors are mostly suitable for pulses (Lentil, Chick pea & Field pea) & oilseeds (Sesame and linseed), the more water requiring crops like wheat, menthe, paddy etc may be promoted on limited extent.
- The mixed and inter-cropping in pulses may be promoted as an insurance against climatic aberrations.
- Fieldpea has emerged as the potential pulse crop in the region which needs promotion by state agricultural departments.

- Also, instead indiscriminate use of chemical fertilizers, more application of bio-fertilizers, seed priming, seed treatment, judicious water use and bio-control of insect and pests need attention.
- A district-wise contingency plan should be ready in anticipation of any climatic emergencies.
- Management of natural resources through watershed approaches is need of the hour for this region.
- Kharif crops may be promoted at equal scale of rabi.
- Apart from major nutrient of soil there is need to focus on organic carbon, sulphar and other micro nutrients for management of clay and sandy clay soils in the region.
- There is need for re-standardizing the package of practices for different field crops in the light of changing climatic condition.
- For efficient management of irrigation water, farmers need to be made aware of most critical stages of crop for application of irrigation.

### vii. Issues related to weed management

- Weeds like parthenium, motha, kaans, etc have become perennial and menace for the kharif as well rabi crops in the region.
- Hazardous and obnoxious weedsare be eradicated from the region through mission mode approach using manual, chemical and biological methods.
- Kind, dose, timing and methods of application of weedicides and other plant protection chemicals need to be carefully considered by the farmers and extension officials.

### viii. Issues related to farm mechanization

- As the farmers of the regions have poor investment ability for large farm machines, their custom hiring may be be promoted by the development departments, KVKs, SAUs and ICAR institutes for enhancing the energy efficiency at agricultural farm.
- The small and medium sized farm implements may be encouraged for use by promoting their fabrication and manufacturing at the local level.

### ix. Marketing related issues

- Farming is also being felt as less remunerative in the region as the cost of cultivation is increasing constantly but the price of the farm produce is not attractive.

- Most of the share in consumer price is taken by the middlemen and traders without spending any cost and farmers receives very less.
- The existing system of price fixation of farm produce is based on the auction basis which is trader-centered and farmers' voice is ignored in the process.

### x. Social issues

- Migration of rural people has become a general phenomenon in the region.
- Rural youths and poor farmers are also making seasonal migration in search of employment and earning money.
- Attracting rural youth and poor farmers in agriculture through appropriate farming related entrepreneurship is the issue.
- During off seasons, agriculture related employment may be created through the works of processing and making value added products from farm produces.
- *Anna-pratha* has become a serious problem for the farmers which are created by farmers themselves. In this *pratha*, most of the farmers leave their animals stray during rainy and summer seasons. As a result, farmers are not able to cultivate crops during these seasons.
- Necessary awareness camps, imposition of penalty by district administrations, turning the large unproductive animal herd to small and productive herd size, barbed wire fencing of crops, etc are some of the potential intervention to mitigate the menace of this system.

## Implications

Based on the discussion and above issues generated, following implications for researchers, development department, other agencies and KVKs could be suggested.

i. The major onus of development lies on the development department for ensuring the necessary infrastructure like roads, electricity, sanitation, etc in the region for prompting the acceleration of development including agricultural development.
ii. The delivery system of agricultural and livestock input and services need serious attention by every concerned department. If the production inputs reached to farmers adequately, timely and affordable price, the path of agricultural development shall become smoother.

iii. As a specific case of livestock development in the region, the large share of unproductive livestock needs to be culled. Every household may keep only productive livestock and they should take their appropriate care of breeding, feeding, health care and management needs.
iv. Fisheries are the potential area for the farmers of the region to fetch ensured income. Though state Government has the scheme on fisheries but it has been designed in faulty style. This scheme should not targets only the small farmers with provision of digging fish pond in area not less than an acre area. These farmers usually do not have enough land holding to spare one acre area for fish pond. Therefore, the large farmers who can afford such scheme should be brought under the ambit of this scheme.
v. The changing climatic condition in this region to be kept in the mind by all related agricultural development departments and accordingly the technologies should be disseminated.
vi. The research agenda for this region need to be prepared based on the ground realities and the research institutes and agricultural universities working in this region must make paradigm shift in their hitherto practiced procedure of identifying researchable issues.
vii. Exodus of rural youth from this region is a serious concern. There is need to start processing industries for making value added products in crops, horticulture, dairying, etc. This may attract the rural youth of this region for farming and retain them within the region itself.
viii. The natural resource management related issue of this region ought to be addressed carefully. Minimizing soil erosion, promoting site specific nutrient management, encouraging farm and social forestry, managing the common property resources, harvesting and conserving the rain water for ground water recharge, reclamation of unsuitable soils, etc are some of the possible interventions for the sustainable and profitable agricultural development in the region.
ix. The institutional convergence for integrated knowledge and information system of agriculture is essential for this region as the region is more resource vulnerable, bio-physically and socio-economically constrained.

## Annexure I

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भाकृअनुप
ICAR

**भारतीय कृषि अनुसंधान परिषद्**
कृषि भवन, डा० राजेन्द्र प्रसाद मार्ग, नई दिल्ली–110 001
**INDIAN COUNCIL OF AGRICULTURAL RESEARCH**
Krishi Bhawan, Dr. Rajendra Prasad Road, New Delhi-110 001

D.O. No.26(4)/2015-Cdn(Tech.)
Dated the 19th August, 2015

Dear Dr. Sandhu,

It has reference to the PMO ID No.100/29/C/1/2015-ES.2 dated the 11th August, 2015 regarding organization of workshop in each Agro-Climatic Zone of the country and the meeting held under the Chairmanship of Secretary, DARE & DG, ICAR on 18th August, 2015. In this connection, a schedule of the Workshops in different Agro-Climatic Zones during October-November, 2015 is, herewith enclosed for necessary action.

1. The Nodal Officer under the guidance of the Chairman of the Workshops may prepare a background note for presentation and discussion during the one day workshops to be organized in the proposed venues with regard to the technological support, extension and demonstration services to the farmers across different areas of agriculture, relevant to the region by 15th September, 2015.

2. The one day workshop may be organized with invitations to Vice Chancellors of Agricultural Universities in the region along with the Director (Research) and Director (Extension); Directors of Institutes and Extension Directorates of ICAR in the region; select Programme Coordinators of KVKs; select farmers in the region; 3-4 Subject Matter Experts, where necessary, all coming to 50-60 persons in the workshop. The workshop may deliberate all the relevant issues of the farmers in the region and develop a clear road map for agricultural development in the region including specific technological support, extension and demonstration services to the farmers within a week of the workshop.

3. The budget, not exceeding Rs 3.00 lakhs per workshop, will be met from the budgetary allocations of Technical Coordination Section of the Council for which the concerned Directors of the nodal Institutes will send the budget requirement well in advance to enable us to process for the timely release.

4. PD, DKMA may please take necessary action to cover the workshop events through DD Kisan and local relevant media in consultation with the DDGs indicated for different zones.

*With regards,*

Yours sincerely,

(Shiv Prasad Kimothi )

**Encl: As above.**

**Dr. Jeet Singh Sandhu,**
Deputy Director General (Crop Science)
Division of Crop Science,
Krishi Bhawan, New Delhi 110 001.

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INDIAN COUNCIL OF AGRICULTURAL RESEARCH
KRISHI BHAWAN, NEW DELHI – 110 001

## Schedule of the Workshops in different Agro-Climatic Zones during October-November 2015

(PMO Reference: PMO ID No. 100/29/C/1/2015-ES.2 dated 11.08.2015)

| S. No. | Agro-Climatic Zone | Geographical Details | Organizing Institutes | Nodal Officers | Chairman of Workshop | Proposed Venue |
|---|---|---|---|---|---|---|
| 1. | Western Himalayan Region | • Jammu & Kashmir<br>• Himachal Pradesh and<br>• Hill Region of Uttarakhand | Indian Institute of Soil & Water Conservation, Dehradun | Dr P K Mishra (Director)<br>Dr. Rajbir Singh (ZPD) | Dr. N K Krishna Kumar<br>DDG (HS) | Jammu |
| 2. | Eastern Himalayan Region | • Arunachal Pradesh<br>• The hill of Assam, Sikkim, Meghalaya, Nagaland, Manipur, Mizoram, Tripura and<br>• the Darjeeling District of West Bengal | Research Complex for North Eastern Region, Umiam, Barapani | Dr. SV Nagachan (Director)<br>Dr. A K Tripathi (ZPD) | Dr. N S Rathore<br>DDG (Edn.) | Barapani |
| 3. | Lower Gangetic Plains Region | • West Bengal (except the Hilly Areas),<br>• Eastern Bihar and<br>• the Brahmaputra Valley | Central Inland Fisheries Research Institute, Barrackpore Kolkata | Dr. B R Suresh (Director)<br>Dr. A K Singh (ZPD) | Dr. A K Singh<br>DDG (FS) | Kolkata |
| 4. | Middle Gangetic Plains Region | • Large parts of Uttar Pradesh and Bihar | Research Complex for Eastern Region, Patna | Dr. B P Bhatt (Director)<br>Dr. A K Singh (ZPD) | Dr. J S Sandhu<br>DDG (CS) | Patna<br>7 Oct. |
| 5. | Upper Gangetic Plains Region | • Western Parts of Uttar Pradesh and<br>• the Hardwar and Udham Singh Nagar districts of Uttarakhand | Indian Veterinary Research Institute, Izatnagar | Dr. R K Singh (Director)<br>Dr. U S Gautam (ZPD) | Dr. J S Sandhu<br>DDG (CS) | Muzzafarnagar |
| 6. | Trans Gangetic Plains Region | • Punjab<br>• Haryana<br>• Chandigarh<br>• Delhi and<br>• the Ganganagar district of Rajasthan | Central Soil Salinity Research Institute, Karnal | Dr. D K Sharma (Director)<br>Dr. Rajbir Singh (ZPD) | Dr. K M L Pathak<br>DDG (AS) | Karnal |
| 7. | Eastern Plateau & Hill Region | • Chhotanagpur Plateau<br>• Jharkhand<br>• Orissa<br>• Chhattisgarh and<br>• Dandakaranya | Central Instt. of Fresh Water Aquaculture, Bhubaneswar | Dr. P Jayashankar (Director)<br>Dr. Anupam Mishra (ZPD) | Dr. A K Singh<br>DDG (FS) | Bhubaneswar |

| | | | | | | |
|---|---|---|---|---|---|---|
| 8. | Central Plateau & Hill Region | • Bundelkhand<br>• Baghelkhand<br>• Bhander Plateau<br>• Malwa Plateau and<br>• Vindhyachal Hills | Indian Grassland & Fodder Research Institute, Jhansi | Dr. P K Ghosh (Director)<br>Dr. U S Gautam (ZPD) | Dr. J S Sandhu<br>DDG (CS) | Jhansi |
| 9. | Western Plateau & Hills | • Southern part of Malwa Plateau and<br>• Deccan Plateau (Maharashtra) | Directorate of Soybean Research, Indore | Dr. V S Bhatia (Director)<br>Dr. Anupam Mishra (ZPD) | Dr. Alagusundaram<br>DDG (Engg.) | Indore |
| 10. | Southern Plateau & Hill Region | • Interior Deccan and includes parts of Southern Maharashtra<br>• Greater parts of Karnataka, Andhra Pradesh and Tamil Nadu<br>• Uplands from Adilabad Distt. in the north to Madurai District in the South | Indian Institute of Oilseed Research, Hyderabad | Dr. K S Varaprasad (Director)<br>Dr. N Sudhakar (ZPD) | Dr. K M L Pathak<br>DDG (AS) | Hyderabad |
| 11. | Eastern Coast Plains & Hills Region | • Coromandal and Northern Circar Coasts of Andhra Pradesh and Orissa | Central Institute for Brackish Water Aquaculture, Chennai | Dr. K K Vijayan (Director)<br>Dr. Sreenath Dixit (ZPD) | Dr. A K Singh<br>DDG (Extn.) | Chennai |
| 12. | Western Coast Plains & Ghats | • Malbar and Konkan Coastal Plains and<br>• The Sahyadris | Central Coastal Agricultural Research Institute, Goa | Dr. N P Singh (Director)<br>Dr. Sreenath Dixit (ZPD) | Dr. Alagusundaram<br>DDG (Engg.) | Goa |
| 13. | Gujarat Plains & Hills Region | • Hills and Plains of Kathiawar and<br>• The fertile valleys of Mahi and Sabarmati Rivers | Directorate of Medicinal and Aromatic Plants Research, Boriavi, Anand | Dr. Jitendra Kumar (Director)<br>Dr. P P Rohilla (ZPD) | Dr. A K Sikka<br>DDG (NRM) | Anand |
| 14. | Western Dry Region | • Extending over Rajasthan<br>• West of Aravallis | Central Arid Zone Research Institute, Jodhpur | Dr. R K Bhatt (Director)<br>Dr. P P Rohilla (ZPD) | Dr. A K Sikka<br>DDG (NRM) | Jodhpur |
| 15. | Island Region | • Andaman-Nicobar and Lakshadweep | Central Island Agricultural Research Institute, Port-Blair | Dr. S. Dam Roy (Director)<br>Dr. Sreenath Dixit (ZPD) | Dr. N K Krishna Kumar<br>DDG (HS) | Port-Blair |

**Annexure-II**

## ICAR-INDIAN GRASSLAND AND FODDER RESEARCH INSTITUTE, JHANSI
## &
## ICAR-AGRICULTURAL TECHNOLOGY APPLICATION RESEARCH INSTITUTE (ATARI), KANPUR-208002

***Workshop on Agricultural Development Issues of Central Plateau and Hill Region***

***Venue: ICAR-IGFRI, Jhansi***

***Dated: 30-11-2015***

| Time | Programme | |
|---|---|---|
| 9:30 am | Registration | |
| 10:00 am | Inauguration with ICAR Song & Welcome Address | Dr. P K Ghosh, Director, IGFRI & Nodal Officer |
| 10.05am | Introductory Remarks | Dr J S Sandhu, DDG(CS), ICAR & Chairman |
| 10:10 am | Background information on geographical, agroclimatic and agricultural development in the region | Dr. U.S. Gautam, Director, ICAR-ATARI, Kanpur& Nodal Officer |
| 10.15-11.00 am | Views of Farmers | |
| **11:00 am** | **Tea Break** | |
| 11:15 am – 14:15 pm | Views by the KVKs of Bundelkhand and plateau region of Uttar Pradesh and Madhya Pradesh and NGOs | Heads of the KVKs and NGOs |
| **14:15 pm** | **Lunch break** | |
| 14:45 to 15:30 pm | Views by the KVKs of Bundelkhand and plateau region of Uttar Pradesh and Madhya Pradesh and NGOs | Presentation Continued |
| 15:30-16.00 pm | Views of Directors of IIPR, Kanpur, DSR, Indore, CIAE, Bhopal, IISS, Bhopal, DWR Jabalpur, CAFRI, Jhansi and Directors State Deptt. | |
| **16:00 pm** | **Tea Break** | |
| 16:15-16.45 pm | Views of VCs of RLBCAU, Jhansi, BUAT, Banda, JNKVV, Jabalpur, RJVSKVV, Gwalior and BU Jhansi | |
| 16.45-17:15 pm | General Discussion and Interaction based on above deliberations | Dr J S Sandhu, DDG(CS), ICAR & Chairman |
| | Concluding Remarks | Dr J S Sandhu, DDG(CS), ICAR & Chairman |
| 17:15 pm | Vote of thanks | Dr. R V Kumar, Head-GSM, IGFRI & Coordinator |

**Annexure III**

## List of participants in the Workshop on Agricultural Development Issues of Central Plateau and Hill Region, held at ICAR-IGFRI, Jhansi on 30-11-2015

**Participants from ICAR-IGFRI, Jhansi**

| Sr.No. | Name & Address |
|---|---|
| 1. | Dr.P.K. Ghosh, Director, IGFRI, Jhansi, UP |
| 2. | Dr. R.V. Kumar, Head/GSM, IGFRI, Jhansi, UP |
| 3. | Dr. Khem Chand, Head/Social Sciences Division, IGFRI, Jhansi, UP |
| 4. | Dr. Sunil Kumar, Head Crop Production Division, IGFRI Jhansi. UP |
| 5. | Dr. A.K. Mishra, Head Plant Animal Relationship Division,IGFRI ,Jhansi, UP |
| 6. | Dr. P.K. Pathak, Head FMPHT, IGFRI, Jhansi, UP |
| 7. | Dr. A.K. Roy, PCFC, IGFRI, Jhansi. UP |
| 8. | Dr. D. Vijay, Senior Scientist, IGFRI, Jhansi, UP |
| 9. | Dr.P. Kaushal, Head/C.I, IGFRI Jhansi, UP |
| 10. | Dr. Purushottam Sharma, Principal Scientist.,IGFRI, Jhansi, UP |
| 11. | Dr. Chandan Kumar Gupta, Scientist. IGFRI Jhansi, UP |
| 12. | Dr. A. Maity, Scientist, IGFRI Jhansi, UP |
| 13. | Sadhna Pandey, Senior Scientist, IGFRI Jhansi, UP |
| 14. | Manju Suman, Senior Scientist, IGFRI Jhansi, UP |
| 15. | Shailendra Sinha, Technical Officer, IGFRI,Jhansi, UP |
| 16. | Rameshwar Prasad, Scientist, IGFRI, Jhansi, UP |
| 17. | Dr. Sunil Kumar, (GSM), Principal Scientist. IGFRI, Jhansi, UP |
| 18. | Gitanjali Sahai, Principal Scientist., IGFRI Jhansi, UP |

**Participants from Other institutes/ ICAR**

| Sr. No. | Name & Address |
|---|---|
| 19. | Dr. J.S. Sandhu (DDG) (CS), ICAR, New Delhi |
| 20. | Dr. O.P. Chaturvedi, Director, CAFRI, Jhansi, UP |
| 21. | Dr. Ramesh Singh, CAFRI, Jhansi, UP |
| 22. | Dr. N.P Singh, Director, IIPR, Kanpur, UP |
| 23. | Dr. S.P. Tiwari, Head ICAR-IISWC, Datia, M.P. |
| 24. | Dr. Dev Narayan, PS, IISWC, Datia, MP |
| 25. | Dr. U.S Gautam, Director ICAR- ATARI, Kanpur, UP |
| 26. | Dr. Shantnu Kumar Dubey, Senior Scientist ICAR-ATARI, Kanpur, UP |
| 27. | Dr. K. N. Agrawal, PS, CIAE, Bhopal, MP |
| 28. | Dr. S.D. Billori, PSDSR, Indore, MP |
| 29. | Dr. A.R.Sharma, Dir. DWR, Jabalpur, MP |

| | |
|---|---|
| 30. | Dr. Arvind Kumar, V.C , RLBCAU, Jhansi, UP |
| 31. | Dr. A.K. Srivastava, RLBCAU, Jhansi, UP |
| 32. | Dr. H.G. Parkas, Joint Dir. Res. CSAUT, Kanpur, UP |
| 33. | Roop Singh, AMLP, N.S.C, Niwari, MP |
| 34. | Ajay Soni D.D.M NABARD, Jhansi, UP |
| 35. | P.G. Solanki, BAIF, Jhansi, UP |
| 36. | Dr. O.P. Tripathi, Dy. Dir. Animal Husbandry,Gwalior, MP. |
| 37. | Dr. Sita Ram Dubey, Office of D.D Chhatarpur, MP |
| 38. | Dr. K. Murari, Development Alternatives, Taragram, Orcha, Dist. Tikamgarh M.P |
| 39. | R.S Vyas, N.E.B.J.C, Baruasagar, Jhansi,UP |
| 40. | Ashok Tripathi, Civil Engg. Gramin Development Services. |
| 41. | Hemlata Rawat, GDS Project Coordinator, Lalitpur,UP. |
| 42. | Ashish Purohit, Shiva Gramodyog Sewa Sansthan, 368/1 Nanolegaon, Jhansi, UP. |
| 43. | Dr. M.S. Sengar, YAS, Tikamgarh, MP |
| 44. | Dr. A.K Shukla, Joint Dir. Animal Husbandry |

**Participants from KVKs**

| Sr.No. | Name & Address |
|---|---|
| 45. | Dr. Nishi Roy,PC, KVK, Bharari, Jhansi, UP |
| 46. | Dr. S.K Singh, Senior Scientist., KVK, Sonebhadra, UP |
| 47. | Dr. V.K. Sharma, PC, KVK ,Banda, UP |
| 48. | Dr. Narendra Singh, PC, KVK, Chitrakoot, UP |
| 49. | Dr. C.K. Rai, PC, KVK, Hamirpur, UP |
| 50. | Dr. Sushil Kumar, PC, KVK, Mahoba, UP |
| 51. | Dr. Shriram Singh, PC, KVK, Mirzapur, UP |
| 52. | Dr. R.K.S. Tomar, PC, KVK , Datia, MP |
| 53. | Dr. Ramprakash, Head, KVK, Jalaun, UP |
| 54. | Dr. S.K. Pandey, Incharge , KVK, Lalitpur, UP |
| 55. | Dr. Mukesh Chandra, KVK, Jhansi, UP |
| 56. | Dr. A.K. Chauhan, Head , KVK, Etawah, UP |
| 57. | Shri Ram Singh, PC , KVK, Mirzapur, UP |
| 58. | Ramkishor,Tec. Assi., KVK Bharari, UP |
| 59. | Er. Vikash Kumar, SRF,(NICRA),KVK Jhansi, UP |

# Media Coverage

जागरण 1 दिसम्बर 2015

झाँसी : कार्यशाला में उपस्थित अतिथि व विशेषज्ञ।

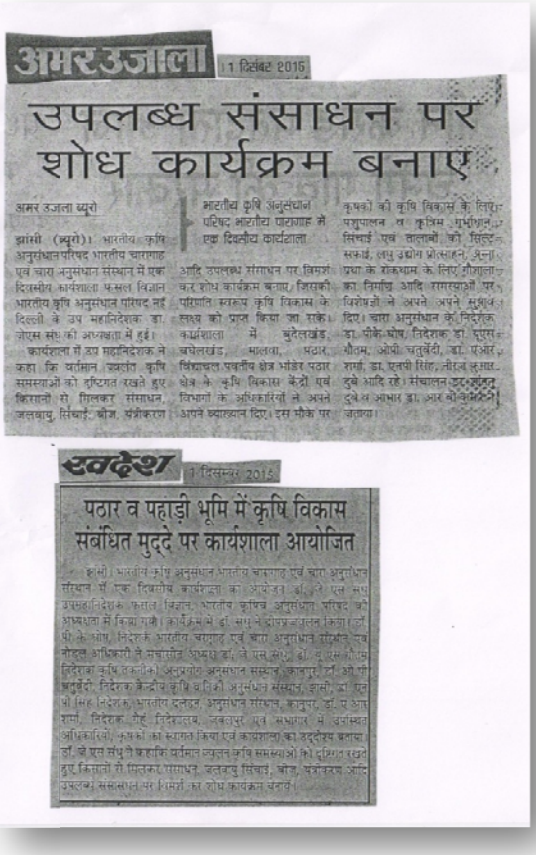
## कृषि विकास पर विशेषज्ञों ने की चर्चा

• किसानों ने गिनाई समस्याएं व सुझाव दिए

झाँसी : भारतीय चरागाह एवं चारा अनुसन्धान संस्थान में पठार एवं पहाड़ी भू-भाग में कृषि विकास विषय पर कार्यशाला का आयोजन उपमहानिदेशक फसल विज्ञान, नई दिल्ली डॉ. जेएस संधु की अध्यक्षता में किया गया। इसमें पशुपालन, सिंचाई आदि मुद्दों पर भी चर्चा की गई।

कार्यशाला को सम्बोधित करते हुए डॉ. जेएस संधु ने कहा कि वर्तमान कृषि समस्याओं को देखते हुए किसानों से मिलकर संसाधन, जलवायु, सिंचाई, बीज, यन्त्रीकरण आदि संसाधनों की उपलब्धता को देखते हुए कार्यक्रम बनाए जाएं, जिससे कृषि विकास का लक्ष्य प्राप्त करने में आसानी होगी। निदेशक कृषि तकनीकी अनुप्रयोग अनुसन्धान संस्थान डॉ. यूएस गौतम ने क्षेत्रीय विकास में आने वाले अवरोधों पर प्रकाश डाला। कार्यशाला में बुन्देलखण्ड, बघेलखण्ड, मालवा पठार, विन्ध्याचल पर्वतीय क्षेत्र, भाण्डेर पठार क्षेत्र के कृषि विकास केन्द्रों एवं विभागों के अधिकारियों ने प्रस्तुतिकरण दिया। कृषकों ने कृषि विकास हेतु पशुपालन एवं कृत्रिम गर्भाधान, सिंचाई एवं तालाबों की सिल्ट सफाई, लघु उद्योग प्रोत्साहन, उन्नत नस्ल बीज उपलब्धता, उत्पाद के प्रसंस्करण, पौध संरक्षण, अन्ना प्रथा की रोकथाम हेतु गौशाला का निर्माण आदि समस्याएं बताईं व सुझाव दिए। इससे पहले निदेशक भारतीय चरागाह एवं चारा अनुसन्धान संस्थान डॉ. पीके घोष ने अतिथियों का स्वागत किया।

इस अवसर पर निदेशक केन्द्रीय कृषि यान्त्रिकी अनुसन्धान संस्थान ओपी चतुर्वेदी, निदेशक भारतीय दलहन अनुसन्धान संस्थान डॉ. एनपी सिंह, निदेशक गेहूँ निदेशालय जबलपुर डॉ. एआर शर्मा, सहायक जनसम्पर्क अधिकारी नीरज कुमार दुबे आदि उपस्थित रहे। कृषि तकनीकी अनुप्रयोग अनुसंधान संस्थान कानपुर डॉ. शान्तनु दुबे ने संचालन व डॉ. आरवी कुमार ने आभार व्यक्त किया।



अमर उजाला 1 दिसंबर 2015

## उपलब्ध संसाधन पर शोध कार्यक्रम बनाएं

अमर उजाला ब्यूरो

झांसी (ब्यूरो)। भारतीय कृषि अनुसंधान परिषद भारतीय चारागाह एवं चारा अनुसंधान संस्थान में एक दिवसीय कार्यशाला फसल विज्ञान भारतीय कृषि अनुसंधान परिषद नई दिल्ली के उप महानिदेशक डा. जेएस संधु की अध्यक्षता में हुई।

कार्यशाला में उप महानिदेशक ने कहा कि वर्तमान जलवायु कृषि समस्याओं को दृष्टिगत रखते हुए किसानों से मिलकर संसाधन, जलवायु, सिंचाई, बीज, यंत्रीकरण आदि उपलब्ध संसाधन पर विमर्श कर शोध कार्यक्रम बनाए, जिसकी परिणति स्वरूप कृषि विकास के लक्ष्य को प्राप्त किया जा सके। कार्यशाला में बुंदेलखंड, बघेलखंड, मालवा, पठार, विंध्याचल पर्वतीय क्षेत्र भांडेर पठार क्षेत्र के कृषि विकास केंद्रों एवं विभागों के अधिकारियों ने अपने अपने व्याख्यान दिए। इस मौके पर भारतीय कृषि अनुसंधान परिषद भारतीय चारागाह एवं चारा अनुसंधान संस्थान में एक दिवसीय कार्यशाला का आयोजन

कृषकों की कृषि विकास के लिए पशुपालन व कृत्रिम गर्भाधान, सिंचाई एवं तालाबों की सिल्ट सफाई, लघु उद्योग प्रोत्साहन, अन्ना प्रथा के रोकथाम के लिए गौशाला का निर्माण आदि समस्याओं पर विशेषज्ञों ने अपने अपने सुझाव दिए। चारा अनुसंधान के निदेशक डा. पीके घोष, निदेशक डा. एसएस गौतम, ओपी चतुर्वेदी, डा. एआर शर्मा, डा. एनपी सिंह, नीरज कुमार दुबे आदि रहे। संचालन डा. [illegible] ने व आभार डा. आर बी [illegible] ने जताया।

स्वदेश 1 दिसम्बर 2015

### पठार व पहाड़ी भूमि में कृषि विकास संबंधित मुद्दे पर कार्यशाला आयोजित

झांसी। भारतीय कृषि अनुसंधान भारतीय चारागाह एवं चारा अनुसंधान संस्थान में एक दिवसीय कार्यशाला का आयोजन [illegible] उपमहानिदेशक फसल विज्ञान, भारतीय कृषिक अनुसंधान परिषद की अध्यक्षता में किया गया। कार्यक्रम में डॉ. संधु ने दीप प्रज्वलन किया। डॉ. पी के घोष, निदेशक भारतीय चारागाह एवं चारा अनुसंधान संस्थान, एवं मोहल आधिकारी ने मंचासीन अध्यक्ष डॉ. जे एस संधु, डॉ. यू एस गौतम, निदेशक कृषि तकनीकी अनुप्रयोग अनुसंधान संस्थान, कानपुर, डॉ. ओ पी चतुर्वेदी, निदेशक केन्द्रीय कृषि यांत्रिकी अनुसंधान संस्थान, झांसी, डॉ. एन पी सिंह, निदेशक, भारतीय दलहन अनुसंधान संस्थान, कानपुर, डॉ. ए आर शर्मा, निदेशक गेहूँ निदेशालय, जबलपुर एवं सभागार में उपस्थित अधिकारियों, कृषकों का स्वागत किया एवं कार्यशाला का उद्देश्य बताया। डॉ. जे एस संधु ने कहा कि वर्तमान बदलते कृषि समस्याओं को दृष्टिगत रखते हुए किसानों से मिलकर संसाधन, जलवायु, सिंचाई, बीज, यंत्रीकरण आदि उपलब्ध संसाधनों पर विमर्श कर शोध कार्यक्रम बनाएं।