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RESEARCH ARTICLE

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ICAR-INDIAN GRASSLAND AND FODDER RESEARCH INSTITUTE (IGFRI): ROLE AND CONTRIBUTION IN COUNTRY'S AGRICULTURE AND DEVELOPMENT

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ABSTRACT

ICAR-Indian Grassland and Fodder Research Institute (IGFRI), a national Institute under the administrative control of Indian Council of Agricultural Research, is mandated to conduct basic, strategic, applied and adaptive research; development and training in forage production and its utilization. The Institute has highly experienced and internationally trained human resources engaged in need-led, participatory, inter-disciplinary approaches. With more than 60 years of experience in forage research and development, IGFRI today stands as the premier R&D institution in South Asia for sustainable agriculture through quality forage production for improved animal productivity. The Government of India established IGFRI under ICAR in Jhansi, U.P., the city of Rani Lakshmi Bai, to ensure the supply of nutritious green and dry fodder and promote efficient grassland management. Known as "Grassland", the institute focuses on forage crop and grassland research, technology dissemination, and human resource development to boost livestock productivity. Since 1970, IGFRI coordinates AICRP-FCU with 23 sub-centres across India. Four regional centres are located at Avikanagar (Rajasthan), Dharwad (Karnataka), Palampur (Himachal Pradesh), and Srinagar (Jammu & Kashmir).

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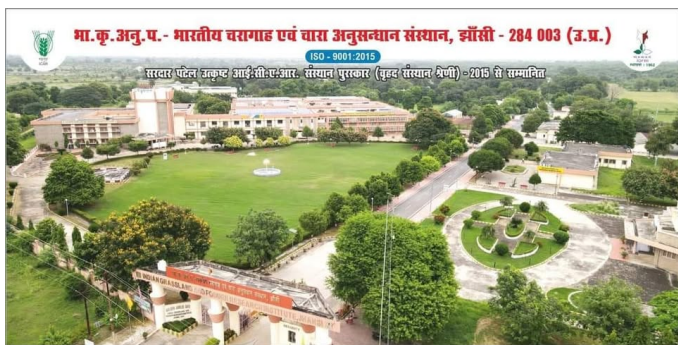
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INTRODUCTION

The Indian Grassland and Fodder Research Institute, established in 1962, has been instrumental in fostering research, training and extension programmes on all aspects of forage production and utilization through inter-disciplinary approach. It has provided technologies, human resource development skills, consultancy and technical services on forage production and utilization to government and non-government organizations, agri-business and farmers. This has been possible due to the benign patronage and guidance of Dr. M.L. Jat, Secretary DARE and Director General, ICAR, New Delhi. It has three regional stations to cater to forage related location specific R&D needs of humid tropics (at Dharwad), semi-arid and arid (at Avikanagar) and temperate (at Srinagar/ Palampur). IGFRI, a national institute under the administrative control of Indian Council of Agricultural Research, is mandated to conduct basic, strategic and adaptive research on improvement, production and utilization of fodder crops and grasslands; Coordination of research on forages and grasslands for enhancing productivity and quality for enhancing livestock productivity; Technology dissemination and human

resource development. The ICAR-Indian Grassland and Fodder Research Institute (IGFRI) is a research institute in Jhansi, India, dedicated to improving grasslands and fodder production, conservation, and utilization. Recent activities include a collaboration with Reliance Industries to establish a Centre of Excellence for bioenergy grasses and a foundation stone laying for an Advanced Plant Phenomics Facility. The institute conducts research through various divisions and has played a key role in developing technologies to enhance India's fodder security and support the livestock sector.

History of IGFRI: ICAR-Indian Grassland and Fodder Research Institute (IGFRI) was established in 1962 as the "Indian Grassland Research Institute (IGRI)" to address the need for quality fodder for livestock. The institute began focused research on grassland and fodder crops. In 1965, it was renamed as the "Indian Grassland and Fodder Research Institute." Since 1970, IGFRI has been coordinating the All India Coordinated Research Project on Forage Crops. The headquarters is located in Jhansi, Uttar Pradesh, with four regional research centres at Avikanagar (Rajasthan), Dharwad (Karnataka), Palampur (Himachal Pradesh), and Srinagar (Jammu & Kashmir).



IGFRI, Jhansi

The Institute has been instrumental in fostering research, training and extension programmes on all aspects of forage production and utilization through inter-disciplinary approach. It has provided technologies, human resource development skills, consultancy and technical services on forage production and utilization to government and non-government organizations, agri-business and farmers. This has been possible due to the benign patronage and guidance of Dr. T. Mohapatra, Secretary DARE and Director General, ICAR, New Delhi. It has four regional stations to cater to forage related location specific R&D needs of humid tropics (at Dharwad), semi-arid and arid (at Avikanagar) and temperate (at Srinagar/ Palampur)

Purposes and mandates: IGFRI was created to act as a centralized hub for scientific research on grasslands and forage crops to enhance livestock productivity and sustain agricultural growth.

The key purposes and mandates of setting up IGFRI include:

- **Research & Development:** Conducting basic, strategic, and adaptive research for the improvement, production, and utilization of fodder crops and grasslands.
- **Livestock Productivity:** Ensuring sustainable, high-quality forage production to support the feed demands of the nation's growing livestock sector.
- **Forage Improvement:** Developing high-yielding, nutritious, and resilient fodder varieties that are tailored for both irrigated and rainfed farming systems.
- **Grassland Management:** Developing technologies to rejuvenate degraded grasslands, pastures, and wastelands, and strengthening the ecosystem services they provide (e.g., carbon sequestration, erosion control).
- **Technology Dissemination:** Transferring advanced fodder technology and providing technical guidance to farmers, NGOs, and state departments through training and research efforts.
- **Coordinating Research:** Managing national-level multi-location testing of forage crops through the All India Coordinated Research Project on Forage Crops and Utilization.
- **Policy Support:** Developing fodder resource development plans, such as the National Initiative for Accelerating Fodder Technology Adoption (NIAFTA).

Igfri Focuses: IGFRI, the institute focuses on forage crop and grassland research, technology dissemination, and human resource development to boost livestock productivity.

IGFRI main focuses on:

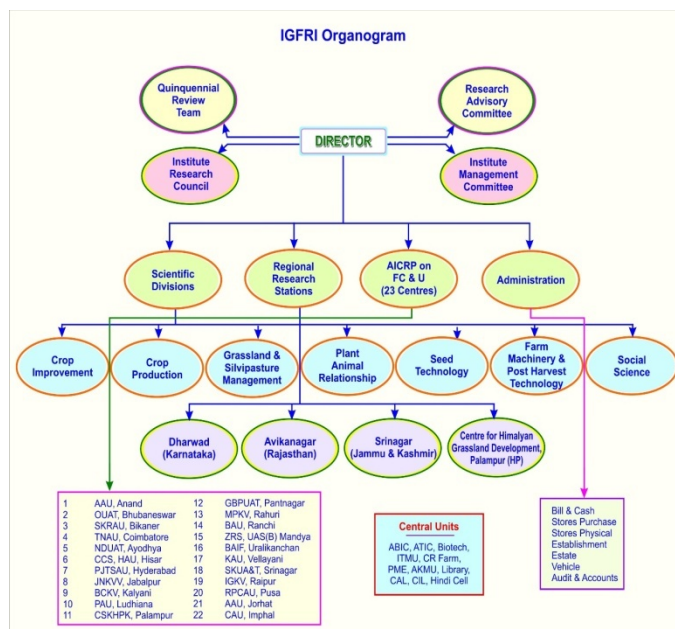
- Research in forage crops and grassland ecosystems
- Technology dissemination for year-round fodder production
- Human resource development in fodder science

Vision of IGFRI: To promote sustainable livestock production and increase farmers' income through enriched grassland resources and assured supply of quality fodder.

Mission of IGFRI

- Conduct research, innovation, and technology development for the conservation, improvement, and utilization of grasslands and forage crops.
- Develop climate-resilient and region-specific technologies for sustainable fodder supply.
- Disseminate technical knowledge and build human resource capacity.
- Design efficient tools, machinery, and methods for livestock nutrition and management.
- Empower farmers and stakeholders for fodder-based livelihood enhancement.

Organizational structure of IGFRI: The organizational structure of ICAR-Indian Grassland and Fodder Research Institute (IGFRI), Jhansi, is designed to facilitate research, development, coordination, and administration through various specialized divisions, research stations, and projects under the leadership of the Director. The organogram illustrates the interconnected committees, divisions, and central units working collaboratively to achieve the institute's objectives.



Divisions: - 1. Crop Improvement 2. Crop Production 3. Grassland & Silvi-pasture management 4. Seed Technology 5. Plant Animal Relationship 6. Social Science 7. Farm Machinery and PHT Division

Major Achievements

- Developed over 350 forage varieties, including 100+ climate-resilient types.
- Research in grassland development, forage production, conservation, utilization, and livestock management.
- Innovative technologies: year-round forage systems, hydroponics, Azolla, organic fodder, silage, feed blocks, etc.
- Machinery: seed drills, pellet machines, urea treatment threshers, etc., widely adopted by farmers.
- MoUs with academic institutions and entrepreneurs for technology transfer.
- R&D in 28 Indian states for forage improvement and livestock productivity.

Farmer-Oriented Projects: IGFRI leads national/international projects like NIFTD, Model Fodder Villages, Adarsh Gram Yojanas, Unnat Bharat Abhiyan, Farmer FIRST, and NEH projects. These involve farmers, especially women, in fodder production, balanced nutrition, machine use, seed processing, and storage, improving livelihoods and income.

Roles of IGFRI

- **Primary focus:** -The main objective of IGFRI is to conduct scientific research on grasslands and fodder production, conservation, and utilization.
- **Enhancing fodder security:** - The institute aims to improve the availability and quality of fodder to strengthen the livestock sector and enhance the livelihoods of farmers, as highlighted by its contribution to the country's livestock sector.
- **Promoting sustainable practices:** - IGFRI researches and develops technologies for using underutilized resources like grasslands and wastelands to improve fodder self-reliance and livestock productivity.

Recent developments of IGFRI

- **Bioenergy grass centre:** -A recent Memorandum of Understanding (MoU) with Reliance Industries Ltd. was signed to establish a "Centre of Excellence for Research on Bioenergy Grasses," focusing on developing grasses for bioenergy applications.
- **Advanced Plant Phenomics Facility:** -A foundation stone was laid for an Advanced Plant Phenomics Facility as part of the collaborative bioenergy project.
- **Technology dissemination:** -The institute works to disseminate its technologies through various channels, including its regional research centres and the All India Coordinated Research Project on Forage Crops and Utilization.

Research and activities of IGFRI

- **Multidisciplinary research:** -The institute is organized into several multidisciplinary divisions, including Crop Improvement, Crop Production, and Social Science, to address various aspects of grassland and fodder research.
- **National projects:** - IGFRI serves as the headquarters for the All India Coordinated Research Project on Forage Crops and Utilization, which conducts multi-location testing of forage varieties and technologies across India.
- **Quality evaluation:** - The institute's research also includes evaluating fodder varieties for yield and quality, such as a recent study on oat varieties at its Srinagar regional station.

Key Functions of IGFRI: IGFRI, its primary mission is to conduct research, develop technologies, and promote the production and utilization of fodder and grasses to support livestock production in India. IGFRI was awarded the Sardar Patel Outstanding ICAR Institute Award (Large) for 2015.

Key functions of IGFRI:

Research and Development

- **Forage Improvement:** Developing high-yielding, nutritious, and resilient fodder crop varieties, range grasses, and legumes, including those tolerant to biotic and abiotic stresses (drought, salinity, heat).
- **Grassland Management:** Conducting research on the regeneration, management, and conservation of natural grasslands, rangelands, and Silvi-pasture systems.
- **Seed Technology:** Developing technologies for quality forage seed production, storage, and testing standards for grasses and legumes.
- **Interdisciplinary Studies:** Conducting research on forage production systems, including agroforestry, forage-based rationing, and post-harvest technology for value addition.

Technology Transfer and Extension

- **Extension and Training:** - Organizing training programs, skill development workshops, and field demonstrations for farmers, students, and state government officials.

- **Dissemination of Technology:** - Spreading research findings through initiatives like the "Adarsh Chara Gram" (Model Fodder Village) program and "Mera Gaon Mera Gaurav".
- **Advisory Role:** - Advising farmers on best practices for fodder production, rotational grazing, and utilizing fodder processing technologies.

Coordination and Collaboration

- **AICRP on Forage Crops:** Coordinating the All India Coordinated Research Project on Forage Crops & Utilization (AICRP-FC&U), which operates across 22 centres and 17 testing locations nationwide.
- **Regional Collaboration:** -Operating regional research stations to address regional needs in diverse agro-climatic zones (humid tropics in Dharwad, arid/semi-arid in Avikanagar, and temperate in Srinagar).
- **Partnerships:** - Partnering with state departments, NGOs, and Gaushalas for the implementation of fodder development plans, such as through the National Initiative for Fodder Technologies Adoption (NIAFTA).

Core Mandates

- **Genetic Conservation:** Collecting and conserving forage plant genetic resources to protect biodiversity.
- **National Database:** Developing a comprehensive database on forage and grassland resources, including using geospatial technology.

Foundation day celebration: -1st November, 2021, Jhansi

Indian Grassland and Fodder Research Institute celebrated its *Foundation Day* today. Delivering the Foundation Day Lecture, the Chief Guest, Deputy Director General (Crop Science), ICAR urged the Staff Members for working with positive approach and dedication for the betterment of all the stakeholders. The Guest of Honor, Director, ICAR-Central Agroforestry Research Institute, Jhansi, Uttar Pradesh underlined the complementarities of agroforestry research with the integrated component of fodder crops which is highly suitable for all the parts of the country, especially, Bundelkhand Region. Earlier, Director ICAR-IGFRI, Jhansi highlighted the various new initiatives taken by the Institute. The Staff Members of ICAR-IGFRI, Jhansi & its Regional Stations; ICAR-CAFRI and RLBCAU, Jhansi participated in the event.

DG, ICAR launches ICAR-IGFRI reliance collaborative project on Bioenergy-19 August 2025, Jhansi

Secretary (DARE) and Director General (ICAR) along with Deputy Director General (Crop Science) ICAR today, launched 'Centre of Excellence for Research on Bioenergy Grasses', under the ICAR - Indian Grassland and Fodder Research Institute, Jhansi and Reliance Industries Ltd. collaborative project 'Utilizing Perennial Grasses for Revolutionizing Sustainable Bioenergy under Challenging Environments' and also laid the foundation stone of the 'Advanced Plant Phenomics Facility' under the project. Secretary (DARE), while interacting with the institute staff, appreciated the achievements and contribution of the institute for improving fodder security of the country and strengthening the livelihood of the farmers. Along with this, he also underlined the need for demand-driven, transdisciplinary and creative research efforts for furthering the prosperity of India and its farming community. Deputy Director General (Crop Science) ICAR, in his address, applauded the efforts of the institute in developing various fodder technologies which contributed immensely in the development of the country's livestock sector. At the outset, Director, ICAR-IGFRI, briefed about the institute's activities and achievements. The Reliance officials expressed the gratitude for joining hands with ICAR-IGFRI and informed about the significance of the collaboration by advancing forage research and utilising grasses for bioenergy purposes.

Core Focus Areas of IGFRI: IGFRI focuses on comprehensive research, development, and capacity building to improve forage production and grassland management. As a premier national R&D institution, it enhances livestock productivity by developing improved forage crop varieties, managing grassland ecosystems, and training stakeholders. IGFRI also collaborates with various institutions and NGOs to transfer technology and ensure year-round fodder availability for livestock.

Core focus areas

- **Forage Improvement & Seed Technology:** The institute focuses on genetic resource conservation, breeding high-yielding and climate-resilient forage crops, and producing quality seeds (e.g., breeder seeds of grasses and legumes).
- **Crop Production & Resource Management:** Research includes developing sustainable cultivation techniques, utilizing plant growth-promoting microbes, managing rhizosphere biodiversity, and implementing precision nitrogen management.
- **Grassland Management & Restoration:** IGFRI focuses on rehabilitating grazing lands through Silvi-pasture systems and restoring degraded land using perennial grass plantation techniques, particularly in hilly regions like the Himalayas.
- **Social Science & Technology Transfer:** The Social Science Division promotes the adoption of forage innovations, conducts technology impact assessments, and strengthens value chains. They run outreach programs like *Adarsh Chara Gram* (Ideal Fodder Village) to improve rural livelihoods.
- **Key Technologies Developed:** Significant innovations include single-eye bud technology for fodder multiplication, smoke water machines for seed germination, and standardization of seed standards for various grasses and legumes.

Key Roles and Functions of IGFRI: IGFRI focused on conducting research, developing technologies, and providing training in fodder production and utilization. Its primary roles include improving fodder crop varieties, optimizing grassland management, and advancing sustainable, high-yield feed resources for livestock. With regional research stations, the institute aims to strengthen the livestock industry by addressing critical feed shortages and improving agricultural productivity.

Key Roles and Functions

- **Forage Research & Development:** Conducts fundamental, strategic, and applied research on annual and perennial forage crops, range grasses, and legumes, including the creation of high-yielding, nutritious varieties resilient to climate change (heat, drought, salinity).
- **Grassland & Silvi-pasture Management:** Focuses on restoring degraded lands, managing biodiversity, and developing sustainable, productive farming systems that combine trees, pasture, and livestock.
- **Forage Production & Quality Improvement:** Evaluates forage quality to enhance animal nutrition, develops techniques for fodder conservation (silage/hay), and works on improving low-grade roughages.
- **Seed Technology:** Involved in the collection, conservation, and evaluation of native forage plant genetic resources to ensure the availability of high-quality seeds.
- **Technology Transfer & Outreach:** Facilitates knowledge sharing with farmers, state government officials, and agribusinesses through training programmes, demonstrations, and initiatives like "Adarsh Chara Gram" and "Mera Gaon Mera Gaurav".
- **Policy Support & Data Management:** Acts as a national hub for estimating and monitoring fodder resources, offering valuable guidance to policymakers on livestock feed availability.

Core Strategic Guidelines & Future Focus Areas: IGFRI has developed strategic future guidelines, known as [IGFRI Vision 2050] focusing on enhancing fodder production through technology adoption, sustainable land management, and bridging the gap between demand and supply. The guidelines emphasize climate-resilient agriculture and increased productivity to support India's livestock population. These guidelines are designed to align with India's goal of making livestock husbandry profitable, particularly for small and marginal farmers, by improving the availability of green and dry forage.

Core Strategic Guidelines & Future Focus Areas:

- **Fodder Technology Adoption (NIAFTA):** The National Initiative for Accelerating Fodder Technology Adoption (NIAFTA) is a key program focusing on customizing fodder resource development plans for different states/UTs to enhance fodder productivity.
- **Climate-Resilient Fodder Production:** - Developing forage systems that are resilient to changing climates, particularly for rainfed areas, through the introduction of improved grass and cultivated fodder varieties.
- **Alternate Land Use Systems:** - Utilizing non-competitive land for fodder production, including Silvi-pasture models (trees + pasture) for degraded lands and Horti-pasture models for fruit orchards.
- **Grassland Management and Policy:** - Development of a "National Grassland/Rangeland Policy" to restore degraded grazing lands, update records using GIS/remote sensing, and protect the rights of pastoralists.
- **Seed Production Technology:** - Expanding the seed chain for improved forage varieties to address the high shortage of quality seed.
- **Post-Harvest Management:** - Developing technologies for fodder conservation (silage, hay, feed blocks) to ensure availability during lean seasons.
- **Modernization and Mechanization:** - Integrating modern science in forage genomics, molecular breeding, nano-technology, and introducing farm machinery to reduce drudgery and increase efficiency.

Action Plan (Road Map)

- **Strengthening Seed Chain:** - Increasing availability of certified seeds for forage crops like Maize, Cowpea, and different grass varieties.
- **Participatory Approach:** - Encouraging the involvement of local communities, panchayats, and NGOs in managing common property resources (CPRs) and pasture development.
- **Quality Improvement:** - Enhancing the nutritional quality of crop residues and promoting efficient use of fodder through processing technologies.

Key extension activities and programs: IGFRI conducts various extension activities aimed at transferring, demonstrating, and implementing improved fodder production and grassland management technologies to farmers, livestock keepers, and state departments.

Key extension activities and programs include

Major Programs and Initiatives

- **National Initiative for Accelerating Fodder Technology Adoption (NIAFTA):** A major initiative to implement tailor-made fodder resource development plans in various states through partnerships with state governments, NGOs, and stakeholders.
- **Adarsh Chara Gram (Model Fodder Village):** An initiative aimed at creating model villages to demonstrate comprehensive fodder production technologies.

- **Mera Gaon Mera Gaurav (MGMG):** A field-level outreach program designed to provide direct scientific guidance to farmers.
- **Farmers FIRST Program:** A participatory project fostering direct research-farmer interaction to enhance productivity.
- **Tribal Sub-Plan (TSP) & SCSP:** Special projects aimed at enhancing forage production among tribal and scheduled caste communities.

Training and Capacity Building

- **Skill Development Programs:** The institute conducts regular training sessions for farmers, rural youth, and state department personnel on topics such as silage making, fodder production, and machinery use.
- **Agri-Business Incubation Centre (ABIC):** Provides technical knowledge and skill development for entrepreneurship in the fodder sector.
- **Kisan Call Centre:** A dedicated service (0510-2730241) that assists with farmers' queries.

Technology Demonstration and Field Activities

- **Participatory Fodder Production:** Implementing trials in mango orchards and on farmers' fields to demonstrate farming systems.
- **Field Demonstrations:** Showcasing high-yielding varieties (e.g., multicut sorghum, cowpea, Bajra-Napier hybrids) and Silvi-pasture systems.
- **Seed Dissemination:** Promoting the use of improved fodder seed varieties through milk cooperatives and farmers' unions.
- **Mechanization Promotion:** Demonstrating fodder harvesting, processing, and pelleting machines through custom hiring centres.

Linkages and Collaborations

- **MoUs with Gaushalas:** - The institute has signed Memorandums of Understanding with over 20 Gaushalas for the transfer of fodder production technologies.
- **State-Level Collaborations:** - Preparing and implementing state-specific fodder resource development plans for states like Assam, Bihar, Tamil Nadu, and others.
- **Public-Private Partnership:** - Collaborating with organizations like TERI and Balinee Milk Producer Company for regional development.

Information Dissemination

- **Digital Outreach:** Using ICAR-IGFRI YouTube channel and social media to share technologies.
- **Technical Literature:** Publishing bulletins, pamphlets, and manuals on fodder management

Key challenges: IGFRI faces numerous challenges in its mission to improve forage production, primarily driven by the widening gap between demand and supply, land degradation, and the impacts of climate change on agriculture. IGFRI is actively addressing these challenges through initiatives like the National Initiative for Fodder Technologies Adoption (NIAFTA), the use of drone-based technology for seed sowing, and development of climate-resilient forage varieties.

Key challenges include:

- **Significant Fodder Deficit:** India faces a critical fodder shortage, with national green fodder deficit estimated at roughly 11% and dry fodder at 25-30%. This shortage directly impacts livestock productivity and farmer income.
- **Declining Grazing Land & Degradation:** Over 120 million hectares of land in India are considered degraded or wastelands, including significant portions of permanent

pastures, which reduces the availability of natural grazing areas. Overgrazing and encroachment further deteriorate existing grasslands.

- **Competing Land Use:** The expansion of land for food and cash crops, along with urbanization, significantly reduces the area available for fodder cultivation.
- **Climate Change & Abiotic Stress:** Frequent weather anomalies like erratic rainfall, droughts, and heat stress, exacerbated by climate change, directly affect forage yield and nutritive value.
- **Seed Availability & Quality:** There is a substantial gap in the demand and supply of quality fodder seeds, with limited interest from the private sector and low seed replacement rates.
- **Technological Adoption & Infrastructure:** Challenges exist in disseminating modern, technology-led interventions—such as efficient grassland management and, improved perennial grasses—through Krishi Vigyan Kendras (KVKs) to small farmers.
- **Shortage of Irrigation:** Lack of irrigation facilities, particularly in marginal areas, makes it difficult for farmers to produce fodder during lean, dry seasons.

Main problems: IGFRI faces several critical challenges related to India's broader fodder scarcity, agricultural limitations, and environmental constraints. IGFRI is actively working on these challenges through "Fodder Resource Development Plans" for various states, developing climate-resilient forage varieties, and increasing farmer awareness through stakeholder consultations.

Main problems addressed by or faced by IGFRI

1. Severe National Fodder Deficits

- **Persistent Shortages:** India faces a net deficit of 11.24% in green fodder, 23.4% in dry crop residue, and 28.9% in concentrated feed ingredients.
- **Low Fodder Productivity:** Fodder production and productivity remain low due to limited quality seed availability, particularly for grasses, with a massive gap between demand and supply.
- **Grazing Land Degradation:** Overgrazing and degradation of permanent pastures, with approximately 12.15 million hectares of land classified as such facing high pressure.

2. Technological and Seed Production Constraints

- **Lack of Improved Varieties:** Insufficient availability of high-yielding, multi-cut, or dual-purpose forage crop varieties.
- **Seed Chain Issues:** Poor seed production, lack of established seed chains for grasses, and low private sector interest in forage seed production.
- **Limited Mechanization:** Inadequate machinery for harvesting grass seeds, leading to high labour costs and poor seed recovery.

3. Environmental and Land-Use Challenges

- **Degraded Land Pressure:** A large portion of India's 120.7 million hectares of degraded/wasteland requires immense effort to reclaim for productive grazing.
- **Climate Change & Abiotic Stress:** Increasing temperatures and unpredictable rainfall negatively affect the establishment, yield, and longevity of forage crops.
- **Invasive Species:** Proliferation of weeds and invasive species on grasslands, such as the invasion of orchards by weeds, complicates fodder cultivation.

4. Socio-Economic and Institutional Constraints

- **Marginalization of Fodder:** Farmers often prioritize food crops over fodder crops, leaving fodder to be grown on marginal lands with poor irrigation.
- **Policy and Market Gaps:** Lack of minimum support prices (MSP) for fodder seeds and inadequate policy support for fodder cultivation compared to food crops.

- **Poor Extension Linkages:** Weak linkages between research findings and field-level implementation, despite initiatives like NIAFTA and Farmer FIRST.

Management-based solutions: IGfRI faces core challenges involving severe shortages of green fodder (36%), dry crop residues (11%), and high-quality seeds (10%) in range grasses. These solutions are aimed at increasing productivity per unit area, enhancing quality, and ensuring year-round fodder availability. To address these, IGfRI focuses on implementing technological, structural, and management-based solutions.

1. Fodder Production Technology Enhancements

- **Quality Seed Availability:** Launching, producing, and distributing high-yield improved varieties of seeds to bridge the 25–30% gap in cultivated fodder seeds.
- **Round-the-Year Production:** Implementing systems for continuous fodder supply under both irrigated and rainfed conditions.
- **Non-Conventional Sources:** Promoting the use of alternatives like cactus and azolla.

2. Land Management & Development

- **Alternate Land Use:** Developing and promoting Silvi-pasture and Horti-pasture models to make productive use of degraded/waste lands.
- **Field Bund Planting:** Utilizing field boundaries, bunds, and channels for fodder cultivation.
- **Community Pastureland Development:** Strengthening panchayats to better manage common property resources (CPRs).

3. Processing and Conservation Technologies

- **Value Addition:** Utilizing processing technologies like feed blocks for easier transport and storage.
- **Fodder Preservation:** Extensive promotion of silage and hay-making to prevent seasonal shortages and minimize waste.

4. Technology Transfer and Capacity Building

- **NIAFTA Initiative:** The National Initiative for Fodder Technologies Adoption (NIAFTA) works with states to design specialized fodder plans and transfer research findings to farmers.
- **Outreach Initiatives:** Utilizing platforms like "Mera Gaon Mera Gaurav" (MGMG) and "Adarsh Chara Gram" to educate rural communities and demonstrate best practices.
- **Farmers FIRST Project:** Implementing field interventions focusing on livestock health and nutritional management.

5. Policy and Research Direction

- **Partnerships with Gaushalas:** Signing Memorandums of Understanding (MoUs) with gaushalas (cow shelters) to implement new production technologies.
- **Participatory Research:** Using Participatory Rural Appraisal (PRA) to align research with the real-time needs of farmers.

Regional stations of IGfRI

Himalayan Fodder & Grassland Research Station, Srinagar (J&K)



Mandate: Basic, applied, strategic and translational research on improvement, production and utilization of temperate fodder crops and grasslands.

Thrust areas: Development of efficient and innovative grassland restoration and fodder production, conservation and utilization technologies. Genetic improvement and development of superior fodder varieties for temperate agro-ecosystems. Production of quality planting material and development of seed standards and forage seed production technologies. Translational research, extension, and capacity building for advancing fodder production/conservation technologies in temperate regions.

Way Forward

- Replicate in other sub-alpine areas of J&K
- Adopt community-led pasture management
- Strengthen linkages between stakeholders for long-term impact

ICAR- Indian Grassland and Fodder Research Institute (IGfRI), Centre for Indian Himalayan Grassland, Bharmat, Palampur



1996- IGfRI Regional Centre temporarily shifted to Palampur, Himachal Pradesh, on account of unfavourable conditions in the valley of Kashmir. 2024- The centre has been recognised by the Indian Council of Agricultural Research and renamed as the ICAR-Indian Grassland and Fodder Research Institute (IGfRI)-Centre for Indian Himalayan Grasslands.

Regional Research Station of Avikanagar



ICAR-IGfRI, Jhansi's Western Regional Research Station of Avikanagar, Rajasthan hosted the visit of 24 young entrepreneur farmers under the Attracting Youth in Agriculture (ARYA) program, KVK, Bundi Rajasthan. Visiting farmers have been provided with the exposure of various fodder crops and their utilisation aspects, while visiting the forage garden and research farm area.

Regional Research Center at Dharwad



Regional Research Centre at Dharwad is an off-season nursery of the Indian Agricultural Research Institute for pulses and other major crops of national importance. It is functioning based on the

Memorandum of Understanding (MoU) with the University of Agricultural Sciences, Dharwad. The Centre has three important functions: i) generation advancement ii) disease screening and iii) generation of new crosses.

CONCLUSION

ICAR-IGFRI, Jhansi, is a premier institute in India dedicated to research in forage crops, grassland management, and livestock nutrition. The goal is to enhance livestock productivity and support farmer livelihoods through assured supply of quality fodder. The institute's innovative forage technologies, climate-resilient crop varieties, and efficient machinery have made fodder production accessible and profitable for farmers. The aim of the institution is to ensure self-reliance and sustainability in the fodder sector by translating research into field-level impact. The institute is committed for promoting innovation in fodder science through collaboration with farmers, scientists, and stakeholders nationwide. Population is increasing in our country day by day at increasing rate. More population means more food is required. So enhancing food production year after year itself a challenge of Indian agriculture. It pressurizing agriculture means pressurizing on land, water and other resources which is pushing our country on the way of unsustainability. In this arena, making our agriculture sustainable and sustainable development of country, is a big question in the mind of scientists, agricultural scientists & scientists of allied fields. Long journey of agriculture after independence, from the way of PL-480, first agricultural university establishment, first introduction of agricultural programme, HYVP, green revolution to precision farming, SRI technique of rice cultivation etc. Presently, our country is nearly self-sufficient in foodgrain production and able to maintain her population comparatively better way. But food itself not sufficient to maintain our health. Along with food security, nutritional security is the need of the hour. In this respect, milk is a balanced & nutritious food, which has high demand in our country. Cattle provide milk, for rearing of cattle, cattle feed is needed. Lion's share of cattle feed is occupied by forage crop production. The institute which is instrumental behind our country's forage crops production is IGFRI. Hence, the institute's contribution in agriculture is remarkable and unmeasurable. India, as a highest milk producing country in the world in the year 1997-98 onwards, dairy sector having significant impact on country's GDP. Hence, in country's development also, IGFRI has indirect & silent but significant role. Few considerations in this respect are the following:

1. **Community pastureland development:** - IGFRI in its extension programmes, should consider this thing and encourage villagers to develop community pastureland in their villages. It will encourage villagers and develop interest on cattle rearing.

2. **Marginalization of fodder:** - Farmers generally give main importance on cereal crops cultivation and least interest on forage crops cultivation. If a farmer along with cereal crops cultivation, in a certain part of land cultivates forage crops and rear few cows or buffaloes, obviously, he will have another opportunity to earn by selling milk. It encourages crop diversification & farming diversification. By that farmers will have, earning diversification which provides strong base of farmers' economy. So, IGFRI extension personnel must promote the thing.

3. **Population control:** - Population control is the need of the hour. A institution is doing its level best for betterment of countrymen, if population increases at increasing rate, is it possible to provide that extent of facilities to every citizen where resources are limited or fixed. So, it is the responsibility of the national government to form & implement a genuine population control policy. In this regard, one proposal to government of India is that to think on this concept: more than three children of an individual mean he will lose his citizenship. Always people favoured policy is not good for nation, sometimes nation favoured policy is needed.

4. **Climate change:** - Climate change is a recent day's global problem. Environment is day by day becoming hotter. Its' bad impact is normal growth of animals & plants is hampering. Height of animals is reducing, weight of animals reducing, milk production becoming less, egg production becoming less and size of egg is reducing, plants normal growth is hampering, as a result, yield is reducing etc. In this background, climate resilient forage crops varieties are to be developed.

5. **Encroachment of grassland:** - Natural grassland of our country especially governmentland, riverside land, reservoir-side land, forest-side land and forest inside land are encroached by people especially persons belong to other country, illegally entered our country & encroaching this land. As a result, grassland area size is day by day decreasing and ultimately impacting on forage crops production as well as cattle rearing. Hence, these outsiders are to be identified day by day & to be deported to their respective countries. Already, SIR has been started by national government and the work is going on and it is the stepping stone for deportation. India is a country, not a Dharmashala.

6. **Forage crops cultivation inclusion in crop rotation:** - Extension personnel of IGFRI must motivate farmers for inclusion of forage crops in their crop rotation. So no need of extra land for forage crops cultivation as well as making silage from that forage crops will provide cattle feed for a certain period which is conducive for cattle rearing.

7. **Riverside grassland development:** - Our country is a riverine country. There are so many rivers and their river beds. If riverside grassland is developed, there will have opportunity to get cattle feed round the year. It is not possible to all riversides, but where it is possible, there grassland will be developed.

8. **Excess crop production is a problem, but excess milk production is blessing:** - Excess crop production i.e. potato, apple, tomato, pineapple, mango etc. even rice and wheat is a problem. Because, surplus production invites wastage, spoilage, perished, low price etc. But, producing more forage crops, encourage cattle rearing will produce more milk. That surplus milk will be consumed nationally, because India is a milk deficit country. Whatever the amount of milk is required for Indians, that amount of milk is not produced. If the surplus production exceeds national demand, then various milk products will be developed and that have high demand in international markets.

9. **How to make fodder from crop residues?** - Crop residues in crop field after harvesting of crops is a recent day burning problem. Due to labour unavailability and more cost involvement, farmers are burning their crop residues in field which is the major cause of modern-day pollution. Burning crop residues hampers the soil health and in a long run, make the soil/field unfertile. To solve the problem, how to make fodder/cattle feed from crop residues, the technology must be invented.

10. **Forage seed distribution:** - One of important efforts of IGFRI will be to produce quality forage seeds and distribute among farmers. Providing forage seeds to farmers itself a inspiration/motivation to farmers to take interest in forage crops cultivation as well as cattle rearing.

11. **Cattle feed production & rationing:** - Along with all recent activities intact, IGFRI will take interest on cattle feed production as silage, concentrated feeds etc. As well as national government must think on cow/cattle rationing. The farmer who is rearing 10 or more cattle, he will get cattle ration from government once in three months. If it is possible, cattle rearing in India will get a boost and milk production will enhance. Main problem of cattle rearing is unavailability of cattle feed. Obviously, cattle rearing will bring a revolution in milk production and if it is possible our country will get nutritional security up to a great extent along with food security. "It is health that is real wealth and not pieces of gold and silver." - Mahatma

Gandhi. Considering the importance of individual health in nation building, it is told, health is not only wealth to an individual, it is a national wealth.

Reference

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