

◆ Research Programmes of Schools

◆ Atmospheric Stress Management

- Quantifying the impact of elevated CO₂, heat/cold etc. on food and horticultural crops, livestock and fisheries
- Adaptive and mitigation strategies for Atmospheric Brown Clouds
- Elucidating molecular basis of adaptation using "omics" approach
- Developing Decision Support System for managing the extreme weather events



◆ Drought Stress Management

- Investigations on physiological manifestations, signal transduction and regulation of stress responsive genes
- Development of screening protocols for traits and genes relevant to stress tolerance
- Use of genomics, phenomics, proteomics and metabolomics tools
- Plant-endo/rhizo bacteria interactions for alleviating stress



◆ Edaphic Stress Management

- Genetic and molecular basis of tolerance and ion homeostasis under salinity, nutrient deficiencies, pollutants, anoxia etc.
- Application of soil meta-genomics, nanotechnology and system biology
- Assessing soil as a sink for greenhouse gases
- Conservation/precision agriculture as adaptive tools for stress environments



◆ Policy Support Research

- Policy research to promote adoption of techniques for adaptations to abiotic stress
- Designing novel management options that provide opportunity for stress mitigation and carbon trading



Guiding Principles

- Professionalism and integrity
- Excellence and innovation
- Knowledge sharing and learning
- Partnerships and teamwork



For further details please contact

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NIASM

At a glance



National Institute of Abiotic Stress Management
(A Deemed-to-be University)
Malegaon, Baramati, Pune, India

Mission

To build sustainable livelihood in abiotically stressed agro-ecosystems by practicing climate resilient farming systems through a deep insight, adaptation techniques, mitigation strategies and acceptable policies

Introduction

NIASM, the unique institute of Indian Council of Agricultural Research (ICAR), was established in 2009 at Malegaon Khurd, Baramati. The institute aims at exploring the avenues for management of abiotic stresses affecting the very sustainability of national food production systems. It specifically addresses the stresses due to atmospheric, water and edaphic factors, which are estimated to cause 50 per cent losses in crop productivity especially under marginal and fragile lands. Since these stresses are predicted to amplify due to climate change and land degradation, the primary task for the institute is to evolve strategies involving mitigation and adaptation techniques through advances in frontier science research. The institute is being structured to enhance capacity of scientists and policy makers mainly by imparting knowledge and providing the state-of- art facilities for multidisciplinary and multi-commodity research. The institute orients its activities to complement the present national and international research efforts.

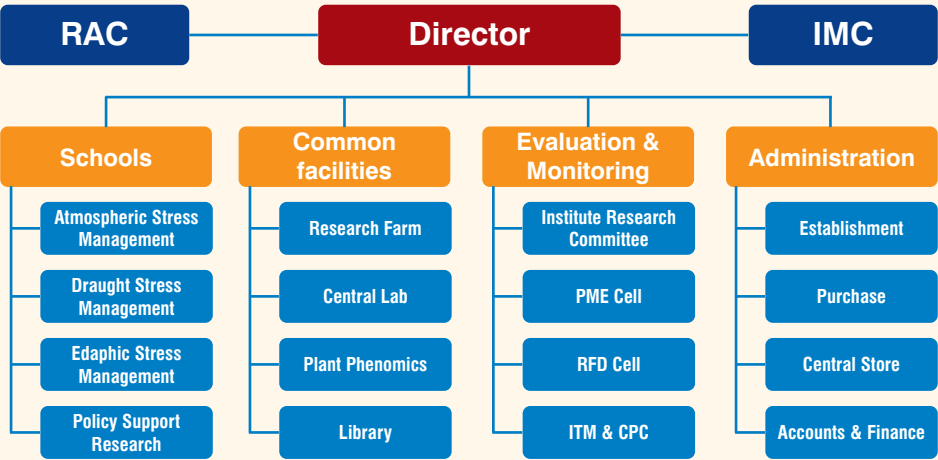
Mandate

- To undertake basic and strategic research on management of abiotic stresses of crop plants, livestock, animals, fishes and microorganisms through genetic, biotechnological and nano-technological tools and through conservation agriculture methods for enhanced and sustainable productivity, food/feed quality and farm profitability through inter-disciplinary and inter-institutional approaches.
- To develop a Global Centre of Excellence by establishing linkages and networking with national and international institutes/agencies.
- To act as repository of information on abiotic stresses and their management.

Staff

The sanctioned cadre strength of the institute is 105 including 50 scientists, 33 technical and 22 administrative staff.

Organogram



Abiotically Stressed Environments

These are the most fragile systems with biophysical constraints of:

- **Soil Edaphic Constraints:** shallowness, coarseness, stony, low fertility, acidity, alkalinity, salinity, pollutants, hypoxia etc.
- **Water Constraints:** deficits: access and quantities, droughts, saline water, excess/waterlogging
- **Landscape constraints:** steep terrain, boulders, undulations, sand dunes
- **Unfavourable climatic conditions:** droughts, cyclones, hailstorms, heat/cold waves etc.
- **Socio-economic constraints:** small and fragmented holdings, low access to markets, poor infrastructure, low literacy, price instability etc.

Infrastructural Facilities

The institute campus is spread over 56.4 ha of area with about 40 ha dedicated to research farm. The main campus includes administrative block, four schools and central lab in addition to hostels, guest house and residential quarters.

Central Lab

Institute has a modular laboratory that has been strengthened with sophisticated equipment like AAS, ICPMS, HPLC, GC, Tetrad PCR, Photosynthesis System, Eddy Covariance System, Spectro-radiometer, Bowen Ratio System, IR Imaging System etc.

Research Farm Development

Intensive efforts have been made to develop a "Model Research Farm" demonstrating the soil and water conservation technologies. The south side farm (16 ha) is divided into six blocks which are sub-divided into 37 rectangular/trapezoidal plots. Since the acquired land was a rocky (basalt) terrain devoid of any vegetation, this was blasted, ripped and levelled with help of heavy machinery support from the Irrigation Dept., Maharashtra. Locally available spent wash was applied to further break down the gravelly murrum. The plots were then finally levelled. Since the virgin soils were still gravelly and low in fertility (OC 0.1%; Av-P 0.5 kg/ha), heavy additions (30-40 brass/acre) of spent mushroom substrate/FYM were made. In addition, 2.7 ha area has been filled-in by transporting black soil. North-east side farm (8 ha; initially 4% slope) has been developed into three blocks of five terraces (width 35-38 m) while 4 ha of north-west side farm including a water balancing tank has been developed into two blocks having 7 research plots. Research activities related to impacts of abiotic stresses on crop production, livestock and fisheries and their mitigation strategies have been initiated on south-farm. Both the north-east and west farms have been put under orchards to address edaphic stress and drought related issues.

Strategy

A six-point interlinked strategy is being adopted to enhance efficiency and effectiveness of research endeavours. It consists of defining the target environments, adaptive techniques, mitigation strategies, policy support in addition to exploitation of synergies through networking. Ultimately these will upscale the institute to a 'Centre of Excellence' for research and education on abiotic stressors.

