Department of Biotechnology
Ministry of Science and Technology
Government of India

सत्यमेव जयते

Azadi Ka Amrit Mahotsav

INVITES PROPOSALS
ON
'ARTIFICIAL INTELLIGENCE (AI) APPLICATIONS IN AGRICULTURE & PLANT SCIENCE'

Last Date for Proposal Submission: **21st January, 2023**

BACKGROUND:

Global population is expected to reach about 10 billion by 2050, which in turn will constrain existing land and water resources, requiring an increase in agricultural production by 70% in order to sustain the supply chain towards food security. Smarter and more modern approaches are therefore necessary in agricultural research so that farming practices may achieve sustainability and climate resilience in our cropping systems. This is particularly relevant for India, since majority of Indian population is directly dependent on agricultural and allied sectors as primary source of livelihood.

Artificial Intelligence (AI) is being increasingly used in a wide number of areas, including agriculture and allied sectors. Use of AI in agriculture and plant science research will facilitate identification of most suitable lines for breeding programmes, identification of candidate genes for stress resistance as well as QTLs for trait enhancement and ecological sustainability. This has tremendous benefits for the farmer in terms of crop-cycle monitoring and informed decision making for a variety of purposes including irrigation management, plant health, pest/disease detection, fertilizer application, weed control. Such benefits would enable timely interventions and resource allocation via actionable insights AI powered agriculture and plant science can aid in development of new and innovative technologies to overcome the challenges being encountered in conventional methods currently adopted by farm enterprise.

Department of Biotechnology (DBT) announces this call under the new initiative in "**Artificial Intelligence (AI) Applications in Agriculture & Plant Science".**

THRUST AREAS:

- Crop yield enhancement via Big data analytics and AI/ML
- AI assisted irrigation, pesticide treatment, sowing, soil quality improvement and other practices
- AI tools for disease diagnosis in crops/ plants/ disease prediction using image datasets
- AI based robots in farm harvesting/ Drones in agriculture
- Machine learning applications in Plant & Agricultural genomics
- AI powered Ecology & plant biotechnology for weed/stress resistance& management
- Blockchains and Data science in Agri-genomics
- AI assisted farming practices; irrigation, pesticide treatment, sowing, soil treatment etc
- AI/ML for Soil/ crop/ livestock health monitoring
- Optimization of irrigation and application of pesticides and harvecides

- AI powered system to detect pest, automatic weeding, ariel survey and imaging
- Prediction of right crop varieties using images of seeds and plants
- Location and weather based prediction for yields
- Pest identification and timely predictions of invasions
- Early disease prediction and prevention in plants, poultry, fisheries and animals
- Prediction of crop losses due to biotic and abiotic stress
- Precision farming and predictive analytics

The above areas are indicative in nature. However, Investigators may submit any novel, exciting proposal on AI applications in Agriculture and Plant Science.

ELIGIBILITY (WHO CAN APPLY):

Any Indian National holding a regular position in any Indian academic and scientific research institutions (Govt./Private) may apply. This call for proposal is open to all applicants eligible for Govt. funding. The research institutions must be recognized by DSIR as a Scientific and Industrial Research Organization (SIRO). Private institutions/ NGOs should also be registered with Darpan Portal of NITI Aayog. There should be at least one co-investigator from each participating institute and either one of the PI or Co-PI should have remaining service in co-terminus to the duration of the project. The Team of Researchers should be multi-disciplinary with expertise in the areas: Data Science (for example, capability to deal with large amount of data, having expertise in building prediction tools involving Computational Biology, Statistics, Machine Learning, Deep Learning, etc.) through high-throughput omics approach. Researchers working in the AI area can submit their proposal for consideration. The proposal should have well-defined objectives, scope, outcome and quantifiable deliverables with specific time frame. The proposal may be submitted by single institute or multi-institutes with well defined milestones/ timelines and role of each individual institution.

FINANCIAL SUPPORT:

The proposals may be considered for funding for maximum of 3 years and in exceptional cases for 5 years. Researchers having the existing preliminary dataset/ information will be given preference for support.

GRANT COMPONENT:
a) **GIA-Capital (Non-Recurring Budget):**
   - Equipment & Other Accessories

b) **GIA- General:**
   - Manpower (as per Govt. of India guidelines)

c) **GIA- General:**
   - Overheads

d) **GIA- General (Recurring):**
   - Consumables
   - Contingencies
   - Travel (Domestic travel only)
   - Others (if any)

ASSESSMENT AND EVALUATION CRITERIA:

The proposals will be assessed and evaluated based on the following criteria:

- The scientific merit and technical strength of the project
- The National importance of the proposed research activities
- Novelty, level of Innovation and clarity of proposed technical strategy
- Need assessment and demand for proposed work in alignment to national priorities
- Proposal formulation (Precision in the objective, completeness of literature review, preliminary work done, methodology and work plan, resources requested for this purpose, effectiveness of planning and resource management, etc.)
- Proposals can be assessed for establishment of proof-of-concept; development and validation of technology; field trials and commercialization of technology.
- Investigator's credentials and expertise; available facilities; track record and ability of the Investigators to achieve the research goals etc.

MODE OF SUBMISSION:

Interested investigators should submit project proposals online only through DBT electronic project management system 'eProMIS' (http://dbtepromis.nic.in) under Call for proposals in the programme "Artificial Intelligence" as per prescribed format and duly forwarded by executive authority. The proposals which are not submitted through DBT eProMIS portal under "Artificial Intelligence" programme will not be entertained.

PROCESSING OF PROPOSAL:

All received proposals through DBT eProMIS within the time period of the call will be considered by the committee(s) approved by the Competent Authority of DBT as per the Competitive Research Grant System Guidelines of DBT. The project investigators may be invited to make a detailed presentation before the Expert Committee, if required as per DBT norms. The decision of DBT on the proposal will be the final and same will be communicated to the investigator.

The deadline for proposal submission is 21st January, 2023.

For any queries related to this call, please contact:

Dr. Shahaj Uddin Ahmed
Scientist-F,
Department of Biotechnology
Artificial Intelligence Programme
Ministry of Science and Technology, Govt. of India
Block - 2, CGO Complex, New Delhi- 110003
E-mail: shahaj.ahmed@nic.in

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