

# **Call for Innovative Research Project Proposals for Development of Digital Solutions in Agriculture through partnership between academic/research institutions and private IT firms**

## **1. Context**

Agricultural systems in India is complex, and has enormous scope for integrating technology to improve productivity and lift millions out of poverty and to feed an exponentially growing population with fewer resources in an ecologically challenging conditions. Over the last twenty years, IT has been the bedrock of innovation in most sectors, be it finance, banking, telecommunications, transportation, automotive, etc. Agriculture is yet to see such a trend and these innovations can possibly emerge at the intersection of Agriculture, Information Technology, Internet of Things and Artificial Intelligence. The Agriculture research has to be strengthened to integrate these high-end tools to improve farm management through the entire value chain, supply chain management, provide customized information and advisory services to the farmers. AI-empowered approaches would aid in timely detection of crop health and climate issues and in responding smartly.

Artificial Intelligence, Big data, IoT technologies in a closed loop control system as a Digital solution can be developed to enable smart farming. Today, we see a big gap in the rate at which the Information Technology is growing and its effective utilization in agricultural and allied sectors in India. We can get a large amount of statistical data related to agriculture that are available both on government and public websites. And, also with the advancement of IoT, it is possible to sample the real-time data and status almost everywhere and on anything. This data can be fed to an Analytics platform engine making use of Artificial Intelligence, Machine Learning, Natural Language Processing and thereby create a Digital Solution to aid the farmers for addressing all the uncertain issues faced by farmers in the agriculture sector. Further AI can be used in forecasting weather data, monitoring crop and soil health, decreasing pesticide usage and for protecting crops. AI systems are also helping to improve harvest quality by aiding in detecting health and environmental issues in farms. AI sensors can also help in weed management, thus aid not only in protecting the plants but also contribute in healthier food and more sustainable crop environment. It is recognized that partnership between academic and research institutions with private players would aid in leapfrogging the benefits of IT solutions in agriculture.

Promotion of digital solutions in agriculture is one of the major objectives of the National Agricultural Higher Education Project (NAHEP). ICAR-NAARM envisages to provide a competitive platform for partnership between the academic/ research institutions and private IT solution providers, under NAHEP.

## **2. Objectives**

1. To establish linkages of SAUs with Industry / IT Firms / Start-Ups
2. To develop IT based solutions using AI, IoT ML, BCT, BDA and modern digital solutions in agriculture and allied sectors.

### **3. Indicative Areas of Concepts**

The concepts can be woven around any one or more of the following subdomains related to agriculture and allied sectors, but not limited to:

1. Supply Chain Management
2. Soil, Water & Energy Conservation
3. Agricultural Education Management
4. Prediction and Intelligence Services
5. Post-harvest Management
6. Crop and Animal Health Management
7. Farm Mechanization

### **4. Who can apply**

- 4.1. The call is open to Faculty members or researchers from agricultural universities, public/private academic institutions/ deemed universities.
- 4.2. The proposal must be developed in partnership with any registered Industry / IT Firms / Start-Ups, etc., which has developed applications / solutions related to agriculture and allied sectors using frontier IT tools.
- 4.3. The team shall comprise of a maximum of 5 members including private partners and the Project Leader / PI shall be from the academic institution.
- 4.4. Masters and Doctoral students / research scholars, (not more than three) working in relevant area from the academic institution, shall also be part of the development team as Project Associates, over and above the core team vide 4.3.
- 4.5. Each academic institution shall submit a maximum of three concepts, each with same or different private firm.

### **5. Duration & Budget**

- 5.1. The solution development including piloting, testing and validation shall be completed in a period of nine months.
- 5.2. The budget for each joint project proposal shall be not exceeding Rs. 12 lakhs. However, for exceptionally well-conceived innovative solutions, the limit shall be relaxed.
- 5.3. A roadmap for scaling up and implementation of the solution beyond the initial scope may also be added in the proposal with required (additional?) budget, if applicable. This however, will be reviewed and considered after the satisfactory development of the solution.

### **6. RELEASE OF GRANT**

- 6.1. First installment: 50% of the total cost of proposal shall be released by NAARM to the lead academic institution as advance, within 7 days after the receipt of the signed copy of the sanction order of the project, agreeing to the terms of the implementation.

(The milestones for this 50% cost involved for achieving these target milestones specified shall be mentioned in the project proposal)

- 6.2. Second installment: 25% - After completion of the milestones as mentioned against 6.1. and on submission of the utilization certificate.
- 6.3. Third & Final installment: 25% - After completion of the milestones as mentioned against 6.2. / product launch and on submission of the utilization certificate.

## **7. Responsibilities of both Parties in Product Development**

### **General obligations**

- The parties agree to work together on mutual trust and confidence and mutual independent assessment of the strengths and competencies of the other party.
- The relationship between the Lead Academic Institution with respect to this agreement is limited to the product identified as an independent co-development partner, and nothing in this Agreement will be construed to create a joint venture, agency, or employer-employee relationship.
- Both parties shall have joint Intellectual Property Right (IPR) for registration, commercialization and revenue sharing as per the mutually agreed terms.
- The Lead Academic Institution shall provide access to its infrastructure to the private partnering firm, who in turn shall comply with all extant/ evolving security and safety procedures of the institution.

### **Responsibilities of Lead Academic Institution**

The broad array of roles and responsibilities of the Lead Academic Institution shall be to:

- a. Facilitate in developing the product and in its institutionalization, in its sphere of influence.
- b. Certify the quality of product as fit for use.
- c. Coordinate among the partner companies when multiple parties are involved in the development of the product
- d. Showcase the developed product to promote and propagate, within its extant rules / provisions.
- e. Provide the required resources as part of joint product development viz., implementation, training and support; hosting mechanism, where applicable; source code license management system, etc.

### **Responsibilities of Private Partnering Firm(s)**

- a. Provide access to required resources as committed; professional commitment and timely communication as required.
- b. Use licensed software which has been legally procured or open source software only.
- c. Develop the assigned product adhering to the product delivery plan as agreed from time to time.

- d. Bring in best of their skillsets to the table, which includes exploring marketing opportunities in their accessible markets.
- e. Appoint one product representative to interact with his/ her counterpart in the Academy.
- f. Constitute a project team to develop the product.
- g. Provide all support for the product developed like bug-fixing, customization, enhancement and roll-out, till end-of-life announcement, as agreed mutually.

## 8. How to apply

The research proposal prepared in the prescribed format (Annexure I) duly forwarded by the affiliating institution must be sent to CPI, NAHEP Component 2, ICAR-NAARM, Rajendranagar, Hyderabad-500 030, Telangana by 20th March 2020 through email: [nahep@naarm.org.in](mailto:nahep@naarm.org.in) and [naarm.nahep@naarm.in](mailto:naarm.nahep@naarm.in)

The guidelines of the proposal along with the application form, including relevant annexures, shall be signed by the competent authorities of parties involved and the same shall serve as the MoU between them.

Additional points may also be added to the guidelines through mutual consent of the partnering institutions/ firms. The dispute resolution mechanism, as applicable, shall also be part of the guidelines signed by all parties involved.

## 9. Budget Components

No	Type	Description	Budget proportion
1	Product Development Cost [exclusively earmarked for the partnering firm(s) only]	This may include the cost of man-months involvement of the development team, travel and all incidental expenses related to the project.	Minimum 65%
2	Institutional Contingencies [exclusively earmarked for the academic institution only]	This may include the cost of travel, all incidental expenses related to the project including acquiring IP, conducting brain storming sessions, vehicle hiring, institutional charges, etc.	Maximum 35%

### Note:

1. The product is co-developed by the institution and the firm(s) and hence the product developed cannot be fully outsourced; nor the full cost of development be covered under this component. Both academic institution and firm(s) shall commission their resources for the co-development of solution, to the extent mutually agreed upon.

2. The budget shall not be used for purchase of equipment or fixed assets like laptop, tablets, etc. by both academic institution and the private firm(s).
3. The PI (from the academic institution) shall re-appropriate the expenditure across the budget heads subject not to exceeding the total sanctioned amount.

## **10. Screening Criteria**

- Novelty of the idea and/or the utility of the incremental innovation (50%)
- Potential for IP generation and commercialization (30%)
- Experience of the investigating team / partnering firm in developing digital solutions using frontier tools, particularly in the field of agriculture or allied sectors will be preferred (20%).

## **11. General terms**

- Research undertaken by a Principal Investigator will be reviewed through the submission of periodic progress reports and the project may be discontinued/ terminated if research progress is found unsatisfactory or any rules governing the project are violated.
- The CPI, NAHEP, ICAR-NAARM may, at any time seek for verification of accounts and other relevant documents related to the Project.
- The project tasks shall be undertaken as per the mutually agreed upon timelines.
- No request for additional grant in excess of the sanction budget will be considered.
- The Principal Investigator shall be responsible for timely completion of the Project.
- NAHEP will have no objection if any member of the project staff utilizes the project data for the purpose of publication. The Project proposal/ final report cannot be submitted for the award of any University degree/diploma or funding without the mutual consent of the parties concerned and due credits/ acknowledgement need be given to Funding agency and also the parties involved.
- The Principal Investigator shall report to the CPI, NAHEP in case he /she makes any changes in the research design or in the objectives and plan of work committed. No major change can be made therein without the prior approval of the CPI, NAHEP, ICAR-NAARM.
- The CPI, NAHEP reserves the right to reject any application without assigning any reason. It is also not responsible for any postal delays/ loss for the proposals to reach us.
- Incomplete applications in any respect shall not be considered.
- The final authority related to the interpretation of the guidelines or any issue left is vested with the NAHEP, ICAR-NAARM.

## **12. Obligations of lead academic institution**

1. The lead academic institution shall give an undertaking in the prescribed format contained in the Application Form to administer and manage the NAHEP grant.
2. The lead academic institution will be under obligation to ensure submission of the final report and an Audited Statement of Accounts and Utilization Certificate, (in the prescribed Proforma GFR 19-A) duly certified by the Competent authority of the institution.
3. The lead academic institution shall make suitable arrangements for preservation of data, manuscripts, reports, and tools developed etc. relating to the study.
4. The lead academic institution shall provide the raw data, details of digital solution, or such parts of the study to the CPI, NAHEP, as and when demanded.
5. The Head of the institution shall facilitate in partnering with the private firm(s), and sign an MoU or agreement indicating the collaboration for the specific study. All parties involved shall agree to work together on the solution based on mutual trust and confidence and mutual independent assessment of the strengths and competencies of the other parties.
6. Any differences, disputes, controversies, claims arising from or related to the project/ product development/ developed, shall be resolved by all parties involved as per the internal arrangement and NAARM shall not be a party to the same.
7. All parties shall have a joint IP, and commercialize the solutions as per the mutually agreed terms for revenue sharing, based on specific terms. Already agreed upon.

Further details visit <https://naarm.org.in>