

No. Z-11023/9/2022-Digital Agriculture
Government of India
Ministry of Agriculture and Farmers Welfare
Department of Agriculture & Farmers' Welfare
Digital Agriculture

Krishi Bhawan, New Delhi – 110001
Dated: October 12, 2023

Invitation for Expression of Interest

Ministry of Agriculture and Farmers Welfare, Department of Agriculture and Farmers Welfare, Government of India invites Expression of Interest (EOI) from Start-Ups/Companies to work with the Ministry for leveraging agricultural innovations for farmers welfare in the selected fields.

2. The Form along with the problem statements and framework for leveraging innovations in the Agricultural Sector have been uploaded on the Ministry of Agriculture and Farmers Welfare website (www.agricoop.gov.in). The details of the timeline regarding submission of the proposal are as under:

| S. No. | Critical Dates | From (Date) | To (Date) | Time |
|--------|--------------------------|-----------------------|-----------------------|-----------------------|
| 1. | Document Download | 12.10.2023 | 31.10.2023 | 1000 Hrs |
| 2. | Proposal Submission | 18.10.2023 | 07.11.2023 | 1500 Hrs |
| 3. | Proposal Evaluation Date | TBD by the Department | TBD by the Department | TBD by the Department |

3. All the completed proposals received in the Ministry will be examined and the proposal of interest(s) shall be submitted before the Screening Committee. The committee will identify the suitable entities through a consultation process where Start-Ups/Companies shall be given an opportunity to present their case.

4. The form for submission of proposal is given at Annexure –I. The list of problem statements are given at Annexure –II.

5. The completed proposals are to be sent at us-it@gov.in. The interested entities may also submit their proposal physically through speed post/courier to Under Secretary (IT), Room Number – 39, Krishi Bhawan, New Delhi – 110001. Query(ies) if any may be referred in writing or contact to the undersigned during the office hours.

Encl.: **As above.**

Yours faithfully,

(Chandan Kumar)
Under Secretary to the Government of India
Ph. No: 011-23382926

Signed by Chandan Kumar
Date: 12-10-2023 18:36:48
Reason: Approved



Framework for Leveraging Agriculture Innovations for Farmer Welfare

Form for submitting the proposal by the Start-Ups/Company addressing the technologies/innovations required by the Ministry of Agriculture and Farmers Welfare (MoA&FW)

1. Details of the Start-Up/Company

Start-Up/Company Registered Name:

Date of Registration:

Name of the MD/CEO of the Start-Up/Company:

Area of Interest:

Registered Address:

2. Details of the person(s) to coordinate with the Ministry

Name(s):

Phone/Mobile:

Office:

Personal:

Email Address

Address

City

State

Pin Code:

3. Details of the proposal on the problem statement(s): Select one or more of the following problem statement(s) of the Ministry to which your Start-Up/Company intends to provide solution(s)

- i. Retrieval of weather parameters from geostationary satellites and generation of weather-based information products and services for agriculture applications

(Adoption of the advanced techniques of Satellite meteorology for generating data on all important weather parameters at 1-3 km granularity. Validation of such weather parameters with in-situ measurements from weather stations and generation of weather-based information products and services for agriculture decision-making)

ii. **Scalable models for routine implementation for crop yield estimation at village/GP level to strengthen crop estimation surveys in the country**



(Simplified and scalable models to generate crop yield estimates at least for major crops like paddy and wheat. Periodic assessments during crop season starting from a month after sowing till the end of season, with increasing accuracies from time to time. The final yield estimates shall be available within a month after harvest. Expected accuracy is more than 85% when compared to scientifically measured reference yield data.)

iii. **Soil organic carbon mapping at granular level preferably at farm parcel level**



(Adoption of new datasets such as hyperspectral images and development of models for generating reliable information in the form of maps and statistics on the status of soil organic carbon in the top 30 cm of soil profile.)

iv. **Assessment of the carbon sequestration potential of crop lands and current cropping systems:**



(Development of holistic approach for generating reliable information products in the form of maps and statistics on carbon sequestration potential of crop lands and prioritization of villages/Gram Panchayats on the basis of such information)

v. **Photo analytics and crop assessment**



(Identification of crops and crop risks such as pests, diseases, flood etc, using smart phone-based field photographs)

vi. **Weather-pest modelling and farmer advisories**



(Data driven models for weather-pest modelling and forewarning on pest occurrence and development of farmer advisory system. Should cover major crops and pests, for e.g., pink bollworm in cotton, fall armyworm in maize, bph/stem borer in rice etc.)

vii. **Hailstorms impact assessment on crop lands**



(Capturing hailstorm events in near-time mode and assessing the impact of hailstorms on crops in an objective manner and identification of affected farmers)

viii. **Drone based low-cost solutions to improve digital crop survey**



(Identification of crops using drone-based photographs or multispectral images and translating the crop information on to cadastral map base and produce crop information at villages. Cost effectiveness of such solutions compared to human based crop digital crop survey.)



- ix. Voice-assisted AI/ML-based applications for providing personalized advisories to the farmers



(Developing an application that would provide advisories related to Agriculture to the farmers in their regional languages in voice-assisted mode.)

| | |
|--|--|
| Previous/Current Association with Central Government/State Government/Local Bodies (Enter the Ministry/Department Name and a reference): | |
| Overview of your approach to address the problem: | |
| Technologies suggested to address the Problem Statement: | |
| Details of new datasets, tools and models to be adopted by you | |
| Past experiences/Working (if any) in solving similar problems (attach the outcome/report on PoCs, Field exercise, etc.): | |
| Timeline for addressing the problem statement: | |
| Expectations/requirement from the Government: | |
| Financials, if any (attach detailed plan in case of financial implications): | |
| | |



Concept note/Presentation for the process to address the problem statement(attachment):

(Authorised Person Signature with Company/Start-up Seal)

Disclaimer: The purpose of associating the Start-ups in the field of Agriculture is for sharing of the knowledge, processing loopholes and challenges, providing a ground for nurturing ideas and innovations, and thereby mainstreaming the ideas for the benefits of the stakeholders. The Government shall have no obligation to get into any commercial agreement with the company/start-up as a result of any knowledge sharing or other activities as a result of this program.

PROBLEM STATEMENT(S)

Problem Statements – 1/3

| S.No | Problem Statement | Description |
|------|--|--|
| 1 | Retrieval of weather parameters from geostationary satellites and generation of weather-based information products and services for agriculture applications | Adoption of the advanced techniques of Satellite meteorology for generating data on all important weather parameters at 1-3 km granularity. Validation of such weather parameters with insitu measurements from weather stations and generation of weather-based information products and services for agriculture decision making |
| 2 | Scalable models for routine implementation for crop yield estimation at village/GP level to strengthen crop estimation surveys in the country | Simplified and scalable models to generate crop yield estimates at least for major crops like paddy and wheat. Periodic assessments during crop season starting from a month after sowing till the end of season, with increasing accuracies from time to time. The final yield estimates shall be available within a month after harvest. Expected accuracy is more than 85% when compared to scientifically measured reference yield data. Hybrid yield models or ensemble models or other models with improved weather parameters are preferred. Model results are to be backed by strong validation system |
| 3 | Soil organic carbon mapping at granular level preferably at farm parcel level | Adoption of new datasets such as hyperspectral images and development of models for generating reliable information in the form of maps and statistics on the status of soil organic carbon in the top 30 cm of soil profile |

Problem Statements – 2/3

| S.No | Problem Statement | Description |
|------|---|--|
| 4 | Assessment of the carbon sequestration potential of crop lands and current cropping systems | Development of holistic approach for generating reliable information products in the form of maps and statistics on carbon sequestration potential of crop lands and prioritization of villages/Gram Panchayats on the basis of such information. Sources of input data along with granularity are to be mentioned explicit. Model uncertainty and error budgeting are to be made clear. |
| 5 | Photo analytics and crop assessment | Identification of crops and crop risks such as pests, diseases, flood etc, using smart phone-based field photographs |
| 6 | Weather-pest modelling and farmer advisories | Data driven models for weather-pest modelling and forewarning on pest occurrence and development of farmer advisory system. Should cover major crops and pests, for e.g., pink bollworm in cotton, fall armyworm in maize, bph/stem borer in rice etc. |
| 7 | Hailstorms impact assessment on crop lands | Capturing hailstorm events in near-time mode and assessing the impact of hailstorms on crops in an objective manner and identification of affected farmers |
| 8 | Drone based low-cost solutions to improve digital crop survey | Drone based low-cost solutions to improve digital crop survey Identification of crops using drone-based photographs or multispectral images and translating the crop information on to cadastral map base and produce crop information at villages. Cost effectiveness of such solutions compared to human based crop digital crop survey |

Problem Statements – 3/3

| S.No | Problem Statement | Description |
|------|--|--|
| 9 | Voice-assisted AI/ML-based applications for providing personalized advisories to the farmers | Developing an application that would provide advisories related to Agriculture to the farmers in their regional languages in voice-assisted mode |
| 10 | Generation of crop prospects information products | Crop prospects information products in the form of raster maps and statistics in 100 m granularity for major crops, on fortnightly basis from the beginning to end of crop cycle. Multiple indicators related to weather, soil and crop health are to be used in the methodology. All the crop risks occurring in the season are to be captured. |