ToR (Terms of Reference) for Hackathon on Quality and Quantity Checking of Agricultural Commodities using Artificial Intelligence/Machine Learning at NAFED Warehouses/storage locations – reg.

1. Background of NAFED:

The National Agricultural Cooperative Marketing Federation of India Ltd. (NAFED) was established in 1958 to promote cooperative marketing of agricultural produce to benefit farmers. NAFED is registered under the Multi-State Co-operative Societies Act and is engaged in procurement, distribution, and export of agricultural commodities. It plays a vital role in supporting farmers through market interventions and trade facilitation.

2. Objective:

The objective of the Hackathon will be to encourage innovation and digital solutions relevant to agriculture and cooperative marketing, build prototypes that enhance NAFED's digital platforms particularly focusing on Quality and Quantity checking of Agriculture Commodities using Artificial Intelligence/Machine learning at NAFED warehouses/storage locations. This will promote the use of emerging technologies like AI/ML, in agriculture domain, engage startups and IT professionals in solving real-life challenges faced by NAFED, and create a pipeline of scalable digital solutions that NAFED can adopt.

3. Scope of Work:

The Hackathon shall focus on developing an innovative IT solution for **Quality and Quantity checking of Agricultural Commodities using Artificial Intelligence/Machine Learning at NAFED warehouses/storage locations.** The Hackathon will focus on solving real-life challenges faced by NAFED in Procurement of Agricultural Commodities. The solution should aim to:

a) Automate the process of quality assessment of agri-commodities using image recognition, sensors, or AI-based models.
b) Accurately measure quantity and quality with minimal manual intervention/without manual intervention, reducing errors and fraud.
c) Provide real-time data to NAFED officials for procurement decisions and record-keeping.
d) Ensure scalability of the solution across multiple warehouses and storage facilities.
e) Be cost-effective, farmer-friendly, and aligned with NAFED's procurement operations.

Note: *Annexure -1: Parameters for Quality and Quantity Checking of Agricultural* Commodities shall be seen on page 8.

4. Problem Statement

NAFED procures large volumes of Agricultural Commodities from farmers across India and stores them in its warehouses/storage locations. At present, the process of **Quality and Quantity checking** of commodities is carried out largely through manual intervention. This leads to several challenges such as:

- **Inconsistency in quality assessment** due to human subjectivity.
- **Delays in procurement operations** caused by manual inspection.
- **Risk of errors and fraud** in weight measurement and reporting.
- **Lack of real-time data** for decision-making and record-keeping.
- **High operational costs** and scalability issues when monitoring multiple warehouses.

5. Expected Outcomes

The Hackathon is expected to deliver the following outcomes:

a) **AI/ML-based Prototype**: A working model demonstrating automated quality and quantity checking of agricultural commodities at warehouse/storage locations.
b) **Accuracy & Reliability**: A solution capable of minimizing manual errors, preventing fraud, and providing consistent, reliable results for commodity assessment.
c) **Real-time Monitoring Dashboard**: A user-friendly interface/dashboard for NAFED officials to view real-time data on commodity quality, quantity, and storage conditions.
d) **Integration Capability**: A design that can be integrated with existing NAFED procurement systems, weighbridges, or ERP platforms for seamless operations.
e) **Scalability & Cost-effectiveness**: A solution that is deployable across multiple warehouses/storage facilities, using affordable technologies suitable for large-scale adoption.
f) **Farmer & Stakeholder Benefits**: A transparent mechanism ensuring fair assessment of farmers' produce, faster decision-making, and improved trust in NAFED's procurement system.
g) **Implementation Roadmap**: A clearly defined plan outlining timelines, required infrastructure, and steps for scaling the solution to production level.

6. Participants:

Participants will include IT Startups/Cooperatives from IT, AgriTech, Agricultural domains. Teams comprising of students/researchers from recognized universities/institutions in Agri, AgriTech, or Agricultural domains may also participate, either independently or in collaboration with a Startup. Teams of IT Startup/ Cooperatives/ Students/Researchers may comprise of 3-5 members only.

7. Expected deliverables shall include:

a) Each participating team/company shall submit an Interim Progress Report midway through the Hackathon (within 15 days of commencement) detailing progress, challenges faced, and next steps.

b) A Final Report along with the working prototype/demo shall be submitted at the time of presentation. A presentation/demo highlighting the problem, solution approach, and business impact.

c) The reports must include:
   a) Executive summary of the solution
   b) Detailed description of the problem statement addressed
   c) Proposed technology stack and design
   d) Implementation roadmap and benefits with timelines
   e) Potential risks and mitigation plan
   f) Expected impact on farmers, cooperatives, and NAFED's procurement operations
   g) Scalability and alignment with NAFED's mandate.

Note: No TA/DA will be provided to any of the participants.

8. Duration & Timeline:

The proposed timeline will include:
a) Release of Problem Statements - 10 days
b) Development and presentation - Within 30 days
c) Hackathon Event- Will be announced later (to be held New Delhi)

NAFED's shall provide facilitation for visits and provide awards/incentives. Participants will be required to develop and present innovative IT solutions for Agricultural Commodities Procurement based on the scope of work within the defined timelines.

9. Minimum Eligibility & Evaluation Criteria:

a) Minimum Eligibility Criteria for the IT Startup Companies:

Minimum Qualification Criteria	Documentary Evidence to be Provided
Certificate of Incorporation / Registration Certificate	The company shall submit empanelment letter copy along with the participation. The Intending company shall also submit Certificate of Incorporation, Memorandum of Articles of Association and a Board Resolution in favour of authorized signatory, duly Certified by a Company Secretary.
PAN Card of the Company & GST Registration Certificate in its name.	The company shall provide the copies of the same duly certified by the chartered Accountant.
Profile of the participating team (CV's required)	The company shall provide the CV's of the deployed employees on the project.
Declaration/Undertaking	Stating originality of the idea/solution and no infringement of intellectual property rights.

In addition to IT Startups/Professionals/Cooperatives, teams comprising Students/Researchers from recognized Universities/Institutions in Agri, AgriTech, or Agricultural domains may also participate, either independently or in collaboration with a Startup. Such Students/Researchers are required to submit the following documents as part of the Minimum Eligibility Criteria.

b) Minimum Eligibility Criteria for the Students/Researchers:

Minimum Qualification Criteria	Documentary Evidence to be Provided
Identity Proof	Aadhaar Card / Passport / Driving License / Voter ID (self-attested copy).
Educational Proof	Valid Student ID card issued by the University/Institute OR Bonafide Certificate from Head of Department/Institution.
Profile of the Team	CV/resume of each member
Declaration/Undertaking	Stating originality of the idea/solution and no infringement of intellectual property

	rights.
Researchers Credentials (if applicable)	Copy of published papers / research work / project reports.

c) Evaluation Criteria:

The evaluation will be carried out by a Committee constituted by NAFED, and the decision of the Committee shall be final and binding on all participants. For evaluation, the following marks distribution may be proposed as below:

Evaluation Criteria	Marks
Understanding of the objectives of the TOR	20
Innovation & Creativity (Novelty of idea)	10
Proposed Project Plan detailing out dependencies and assumptions with action plan and use cases	20
Technical Feasibility & Functionality	20
Impact on Farmers/Cooperatives/Supply Chain Efficiency	10
Technical Presentation (Also includes Technology Stack proposed to be used, Use cases in Agri Commodities Procurement)	20
Total	**100**

10. Minimum Eligibility & Evaluation Criteria

Prize money shall be awarded subject to successful development, demonstration of prototype, fulfillment of eligibility criteria, and the final decision of the Evaluation Committee constituted by NAFED. To encourage wider participation and reward the best solution, a total prize money of ₹ 10,00,000 (Ten Lakh only) has been proposed, split into three parts as under:

- First Prize: ₹ 5,00,000 (Five Lakh only)
- Second Prize: ₹ 3,00,000 (Three Lakh only)
- Third Prize: ₹ 2,00,000 (Two Lakh only)

11. Firm Details & Experience

The Company/Student/Researchers must provide the following details for the participation as mentioned below:

Detail	Information
Name of the Firm/University/Institute	
Primary Contact Number	
Secondary Contact Number	

Registered Address	
Email id	

12. Terms & Conditions

1. The email ID for sharing participation is itsection@nafed-india.com.
2. IT Startup/ companies/IT professionals, Students, Researchers need to share their participation on or before 15.09.2025 as per the attached format in point no 11.

13. Confidentiality and Non-Disclosure:

Any data/information provided by NAFED for the Hackathon shall be treated as confidential and shall not be shared with any third party without prior written approval.

14. Termination Clause

a) NAFED reserves the right to terminate the participation of any team/participant in the Hackathon at any stage under the following circumstances:
b) Submission of false or misleading information/documents at any stage of the Hackathon.
c) Non-compliance with the Terms & Conditions, Confidentiality, IPR, or other provisions of this ToR.
d) Use of plagiarized content or infringement of any third-party intellectual property rights.
e) Misconduct, unethical practices, or any act prejudicial to the reputation of NAFED.
f) Failure to submit deliverables (reports/prototypes/presentations) within the stipulated timelines.
g) In case of termination, the concerned team/participant shall forfeit any claim to prize money, recognition, or further association with NAFED under this Hackathon.
h) The decision of the Evaluation Committee/Competent Authority of NAFED regarding termination shall be final and binding.

15. Intellectual Property Rights (IPR)

a) All solutions, ideas, prototypes, codes, designs, and related documents developed during the Hackathon shall be considered the intellectual property of the respective participating team.

b) Participants must ensure that their submissions are original and do not infringe upon any third-party intellectual property rights. In case of any violation, the concerned team shall be solely responsible for the consequences.

c) Any pre-existing intellectual property used in the Hackathon must be duly declared by the participants at the time of submission.

d) The Evaluation Committee's decision regarding originality and IPR compliance shall be final and binding.

Annexure -1 : Parameters for Quality and Quantity Checking of Agricultural Commodities

Category	Parameters	Detail
Quantity Parameters	Gross Weight	Total weight including packaging/bags
	Net Weight	Weight of commodity excluding packaging
	Number of Bags/Lots	Count of stored/received bags
	Bulk Density	Weight per unit volume (kg/litre)
	Moisture Loss / Shrinkage	Weight reduction during storage
	Weighbridge/Scale Accuracy	Verification via electronic weighbridge
	Transit Losses	Shortage/excess during transport
Quality Parameters (Physical)	Size & Shape	Uniformity of grains, fruits, or seeds
	Colour	Natural, uniform colour; absence of discoloration
	Odour/Smell	Free from rancid, musty, or chemical odour
	Foreign Matter	Stones, soil, straw, plastics etc. (% by weight)
	Broken/Immature Grains	Percentage of broken or shriveled grains
	Infestation	Absence of live/dead insects, fungus, larvae
	Moisture Damage	Sprouted, moldy, or fermented grains
Quality Parameters (Chemical)	Moisture Content	Typically 12–14% (commodity-specific)
	Protein/Fat Content	For pulses and oilseeds (nutritional value)
	Acidity/FFA	For oilseeds - Free Fatty Acid %
	Aflatoxin / Pesticide Residues	Must be within FSSAI permissible limits
Commodity-Specific	Cereals	• Broken %, • Chalky grains, • Red grains
	Pulses	Dehusked %, Damaged/Discoloured %, Weevilled %
	Oilseeds	• Oil %, • Shrivelled seeds %(Seeds that have become dry, wrinkled, and smaller than normal due to a lack of moisture or improper development), • Aflatoxin level % (Cancer-causing substances)

Corrigendum-1 for the "ToR (Terms of Reference) for Hackathon on Quality and Quantity Checking of Agricultural Commodities using Artificial Intelligence/Machine Learning at NAFED Warehouses/storage locations" – reg.

Sr.No	Page No.in RFP	Existing Clause	Revised Clause
1	6	IT Startup/ companies/IT professionals, Students, Researchers need to Share their participation on or before 15.09.2025 as per the attached format in point no 11.	IT Startup/ companies/IT professionals, Students, Researchers need to Share their participation on or before 30.09.2025 as per the attached format in point no 11.