

INVITATION FOR EXPRESSION OF INTEREST (EoI)

FOR

TRANSFER OF TECHNOLOGY (ToT)

OF

“SELECTIVE TEA PLUCKER”

No: C-DAC(K)/CPS/382/2026-27/09/492

Date: 10 Sep 2026.

C-DAC Kolkata has developed a solution, namely, “TULIP”. This solution includes **Selective Tea Plucker** as an essential component. The system detects the commercially desirable *two leaves and one bud* using AI-based image-processing algorithms. After identifying the target shoot, inverse-kinematics-based robotic control guides the cutting mechanism for precise, selective and minimally damaging plucking, supporting improved tea quality, productivity and reduced dependence on manual labour.

Brief write-up of “**Selective Tea Plucker**” is given below in this document.

Applications for Expression of Interest (EoI) are invited for the purpose of Transfer of Technology (ToT) / commercialization of the above-mentioned product from the organizations with relevant experience.

1. Interested bidders are requested to provide necessary information in a format mentioned under Annexure-I (Part-A and Part-B) below as part of their EoI bid/application along with all relevant supporting documents.
2. **EoI bids need to be submitted in a sealed envelope with marking on top “EoI for ToT of Selective Tea Plucker” and it should reach the following address on or before 1st October 2026**

The Executive Director
Centre for Development of Advanced Computing (C-DAC), Kolkata
Plot - E 2/1, Block - GP, Sector - V, Salt Lake Electronics Complex,
Bidhan Nagar, Kolkata – 700091.
Phone No: 033 2357 3581 / 5989 / 9846

EoI bids shall be opened on 7th October 2026.

3. C-DAC Kolkata reserves the right to extend above mentioned bid submission deadline, in which case, all rights and obligations of C-DAC Kolkata and the bidders relevant to the previous bid submission deadline shall remain same for the extended deadline.
4. C-DAC Kolkata also reserves the right to amend the EoI bid documents already published which would be binding on all the interested bidders. The amendment will be made available on C-DAC’s website, i.e., www.cdac.in well in advance.
5. During evaluation process of the submitted EoI bids, C-DAC Kolkata may ask the concerned

bidder to provide clarifications, if any, on its submitted EoI bid. The request for clarification from C-DAC Kolkata and the response from the bidder/s shall be in writing. No post-submission of EoI bids and/or clarification/s at the initiative of the bidder shall be entertained.

6. Bidders of the received EoI bids may be called for making a presentation before C-DAC Kolkata's ToT Committee for their business plan.
7. Representative/s of C-DAC Kolkata may visit bidder's premises, with prior information, to inspect and assess their facilities mentioned in their EoI bids.
8. After evaluation process of the received EoI bids, C-DAC Kolkata will invite submission of sealed Financial Bids from the technically selected bidders only.
9. C-DAC Kolkata reserves the right to reject all or any application without assigning any reason thereof.
10. EoI bids that are incomplete in any respect or those that are not consistent with the requirements as specified in this EoI document or those do not adhere to the format given below under Annexure-I (Part-A and Part-B), may be liable for rejection and no further correspondences will be entertained with such bidders.
11. Canvassing in any form would summarily disqualify the bidder.
12. All cost and expenses associated with submission of EOI bids shall be borne by the bidders while submitting the EOI; and C-DAC Kolkata shall have no liability, in any manner in this regard, or if it decides to terminate the process of short listing for any reason whatsoever.
13. Contact person on behalf of C-DAC Kolkata for any clarifications on the above mentioned EoI bid document:

Dr. Alokesh Ghosh Scientist G Emerging Electronics Group Centre for Development of Advanced Computing (C-DAC), Kolkata Plot - E 2/1, Block - GP, Sector - V, Salt Lake Electronics Complex, Bidhan Nagar, Kolkata – 700091. Phone No: 033 2357 3581 / 5989 / 9846 Mobile: +91 9088027077 Email: alokesh.ghosh@cdac.in	Dr. Hena Ray Scientist F Cyber Physical Systems Group Centre for Development of Advanced Computing (C-DAC), Kolkata Plot - E 2/1, Block - GP, Sector - V, Salt Lake Electronics Complex, Bidhan Nagar, Kolkata – 700091. Phone No: 033 2357 3581 / 5989 / 9846 Mobile: +91 9830764590 Email: hena.roy@cdac.in
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Competent Authority
C-DAC Kolkata

Technical Information

1.0 About C-DAC

Centre for Development of Advanced Computing (C-DAC) is the premier R&D organization of the Ministry of Electronics & Information Technology (MeitY), Government of India for carrying out R&D in IT, Electronics and associated areas. Different areas of C-DAC, had originated at different times, many of which came out as a result of identification of opportunities.

C-DAC is working on strengthening national technological capabilities in the context of global developments in the field and responding to change in the market need in selected foundation areas. In that process, C-DAC represents a unique facet working in close junction with MeitY to realize nation's policy and pragmatic interventions and initiatives in Information Technology. As an institution for high-end Research and Development (R&D), C-DAC has been at the forefront of the Information Technology (IT) revolution, constantly building capacities in emerging/enabling technologies and innovating and leveraging its expertise, caliber, skill sets to develop and deploy IT products and solutions for different sectors of the economy, as per the mandate of its parent, the Ministry of Electronics and Information Technology (MeitY), Government of India and other stakeholders including other funding agencies, collaborators, users and the market-place.

C-DAC, Kolkata is one of the 12 Centres of C-DAC in India and situated at most privileged and strategic location at Kolkata, India for pursuing R&D activities in the area of electronics & IT.

C-DAC Kolkata's laboratory infrastructure and manpower have got unique strength of pursuing R&D activities in the fields blended with electronics & sensing system, machine olfaction, advanced instrumentation, software development and soft computing.

2.0 Brief Description of the Product to be transferred

Selective Tea Plucker is an intelligent vision and robotic harvesting system that can assess and selectively pluck premium tea shoots based on their visual morphology. Selective Tea Plucker can also be used to automate the delicate harvesting process directly in the plantation, ensuring only the exact standard of "two leaves and a bud" is collected.

The system consists of AI-based imaging depth cameras, and the mechanical execution is developed on a robust gantry system equipped with a high-speed pneumatic cutter, perfectly suited for continuous harvesting operations under rugged, outdoor field environments.

Once system is trained with a sufficient number of image samples of optimal tea flushes using deep learning models (mimicking the eye of an expert human plucker), the system becomes ready for autonomously identifying and targeting the highest quality shoots (two leaves and one bud) across the tea canopy.

Plucking the exact "two leaves and a bud" standard is very important to establish the foundational quality of premium tea right at the point of harvest. Selective Tea Plucker can objectively do this by figuring out the precise spatial coordinates of tender shoots amidst mature foliage and executing a clean cut.



Fig: Graphical image of TULIP System.

Present Day Technological Relevance:

Selective Tea Plucking is highly relevant for India because tea is a major plantation crop linked with employment, exports, and regional economies such as Assam, Darjeeling, Dooars, Nilgiri, and Kerala. Premium tea quality depends on selective plucking of the exact “two leaves and a bud” standard, which is still largely done manually.

At present, Indian tea gardens face challenges such as labour shortage, rising labour cost, inconsistent plucking quality, difficult terrain, and climate-related harvesting uncertainty. Conventional mechanical harvesters improve speed but often lack selectivity, leading to mixing of tender shoots with mature leaves and reducing tea quality.

Selective Tea Plucker addresses this gap by using AI-based vision, deep learning, robotic positioning, and pneumatic cutting to identify and harvest only premium tea shoots. This can improve field-level quality control, reduce dependence on skilled manual labour, minimize leaf damage, and support faster harvesting during the correct plucking window. From an Indian perspective, Selective Tea Plucker also supports the national push toward precision agriculture, smart plantations, indigenous agri-robotics, and AI-enabled farm mechanization. It can help Indian tea estates improve productivity, maintain export-grade quality, and modernize plantation operations while preserving the traditional quality standard of expert human pluckers.

Present Status of the Product:

The instrument has been successfully field tested in TTRI, Jorhat jointly with CIAE, Bhopal with available samples and conditions. Currently the system is stationed at TTRI, Jorhat for further testing and validation.

During this stage, C-DAC, Kolkata is facilitating the technology transfer of the 'Selective Tea Plucking' system. The ToT partner will take the responsibility and necessary actions towards market survey, validation, form factor customization, certifications and other associated activities to take the Selective Tea Plucking system at market and successful commercialization.

Note: The Selective Tea Plucker is presently mounted on a hydraulically operated mobile vehicle to enable smooth and controlled movement within tea plantation rows. The system has been designed with a cantilever-mounted mechanism, allowing the plucking unit to extend over the tea bushes without obstructing vehicle movement or damaging the crop. The entire system is known as TULIP. Currently System can pluck 5-7 tea leaves in One Minute

The Product Features and relevant information are enclosed as **Annexure 2** Along with this EoI Document

3.0 Scope of the ToT Process

The Transfer of Technology (ToT) would be made on non-exclusive basis and on sole discretion of C-DAC Kolkata. C-DAC Kolkata's ToT package may contain following:

- Technical Documentation of the product
- Licenses of the software: The proprietary source code of the software will remain under the guardianship of C-DAC, Kolkata but the source code of the software will be handed over to the esteemed commercialization partner with proper user instructions on a storage device during Technology Transfer.
- C-DAC Kolkata will provide handholding support to the commercialization partner till the validity of the ToT Agreement.
- Bill of Materials of the total system
- Test plan and procedure
- User manual
- Signed of ToT Agreement
- Provision for imparting training to the technology recipients

ANNEXURE- I
EoI of Selective Tea Plucker for ToT

The following details should be submitted along with EoI.

Part - A

A.	Company Profile	
1.	Name of the Organization: Website:	
2.	Details of Contact Person: Name: Address: Telephone: Fax: E-Mail:	
3.	Year of Incorporation:	
4.	Type of Organization: A. Public Sector/Limited/Private Limited/Partnership/Proprietary/Society/A ny other B. Whether Foreign Equity Participation (Please give name of foreign equity participant and percentage thereof) C. Names of Directors of the Board/Proprietors D. Name and address of NRI(s), if any	
5.	Category of the firm: Large/Medium/Small scale unit	
6.	Address of the Registered Office:	
7.	Number of Offices with address (Excluding Registered Office): India Abroad	

8.	Certificate of registration as a manufacturing unit	
9.	Permanent Account Number	
10.	Sales Tax Number/VAT	
11.	Status of ISO 9001, ISO 13485 and other Certifications	
12.	Plan for certification of Selective Tea Plucker for compliance with regulatory requirements	
13.	Annual Turnover for last 3 years:	
<u>Part-B</u>		
B.	ESSENTIAL REQUIREMENTS	
1.	The organization must be a reputed firm/Company/SME/ Start-up/R&D company incorporated in India with standing of at least 3 years.	
2.	The turnover is to be supported by financial statements of accounts/Annual reports duly certified by a Chartered accountant/Balance sheets of last 3 years/Income tax returns for the last 3 years period.	
3.	Company profile, giving details of current activities and management/personnel structure including evidence of incorporation. The company should be registered and ISO 9001 or equivalent certified.	
4.	Details of absorption of technology for a product/knowhow that has been taken up on production scale in the past may also be given.	
5.	The manpower strength (Technical: Mechanical, Electrical, Electronics, Software & Non-Technical etc.) at various levels to be furnished. Technical: A. B.E./B. TECH/PhD B. DIPLOMA C. SKILLED TECHNICIANS D. UNSKILLED Non-technical:	
6.	The list of machine tools/equipments/software/facilities available related with work to be furnished.	
7.	The in-house technological expertise available to be furnished.	

8.	The list of equipments available for inspection and quality control to be furnished.	
9.	The industry should have adequate space for undertaking this work. Available space - Covered & Open to be furnished.	
10.	List of products/technologies worked with as regular activity in last 3 years. Give the list of products/technologies with general specifications and the customers.	
11.	List of PSUs/Govt. Customers – with contact details (Address, Telephone no., Contact Person).	
12.	The details of sales, marketing and maintenance network to be furnished.	
13.	The list of technical collaborations for various ongoing products may be furnished.	
14.	The bidder shall provide details of the sub-vendors in case they propose to employ for Part-work.	
C.	Expression of Interest: Spell out the extent of interest and envisaged market potential	
D.	The ToT will be done stage-wise: The preferred stages may be furnished.	

Note:

Data furnished above is by no means a qualification or disqualification. These are meant to facilitate technical comparison of the EoI bids. “NIL” entries against any particular row can also be given and will be considered.

I hereby declare that the above information is true to the best of my knowledge.

Signature with Name & Seal:

Place:

Date:



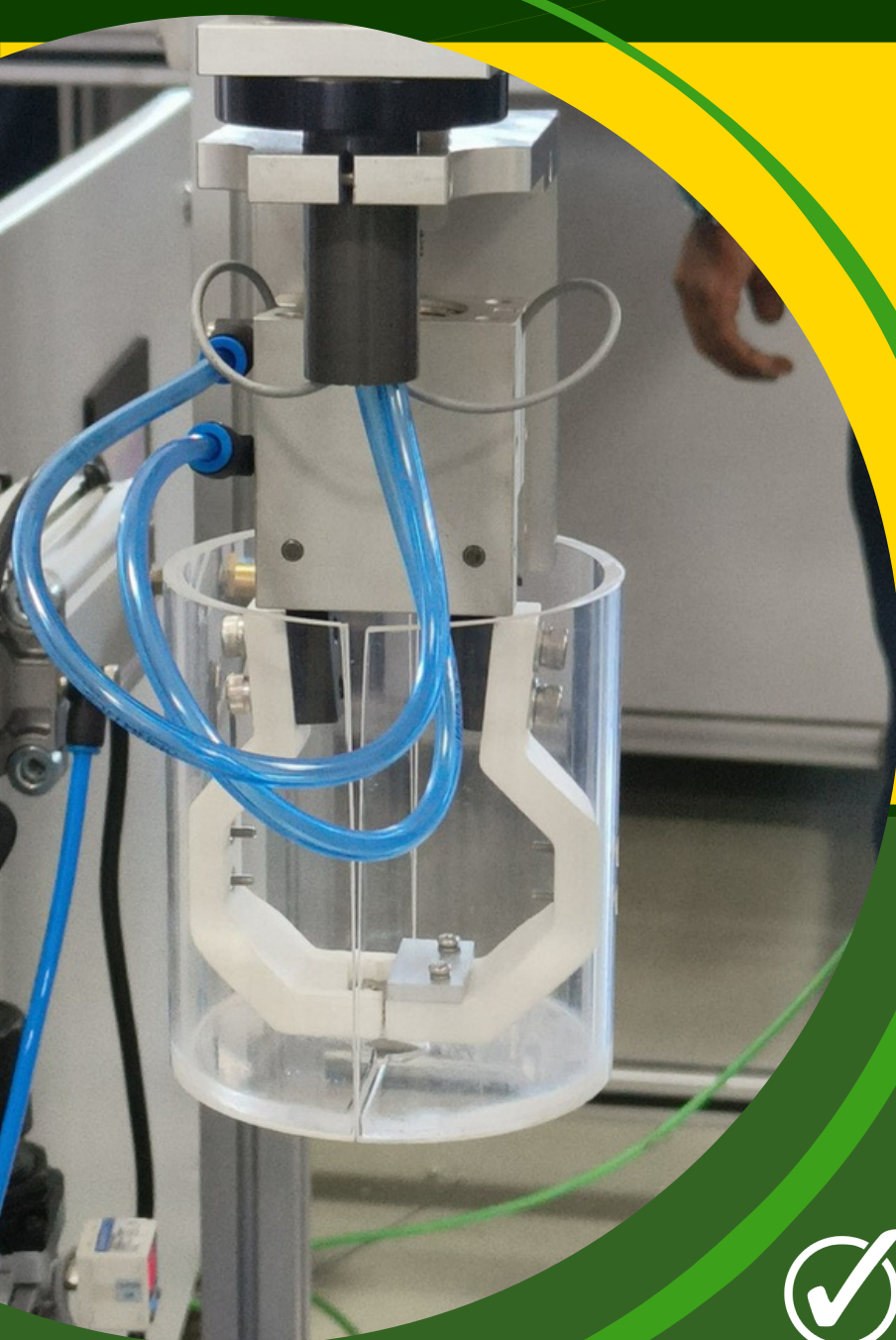
इलेक्ट्रॉनिकी एवं
सूचना प्रौद्योगिकी मंत्रालय
MINISTRY OF
ELECTRONICS AND
INFORMATION TECHNOLOGY

ANNEXURE-2



TULIP

TEA HARVESTING MACHINE



TULIP IS A CUTTING-EDGE TEA HARVESTING MACHINE THAT LEVERAGES ADVANCED AI ALGORITHMS AND ROBOTICS TO OPTIMIZE LEAF SELECTION AND PLUCKING PRECISION. WITH REAL- TIME SENSING AND INTELLIGENT DECISION-MAKING, IT REDEFINES EFFICIENCY AND SUSTAINABILITY IN TEA AGRICULTURE.

TRL : 6

- ✓ SELECTIVE PLUCKING
- ✓ PNEUMATIC CUTTER
- ✓ SIEMENS PLC BASED
- ✓ BATTERY OPERATED
- ✓ MOUNTED ON VEHICLE

93%	LEAVES DETECTION ACCURACY
84%	LEAVES PLUCKING ACCURACY
7	PLUCKING PER MINUTE

FEATURES

- | | | | |
|----|--|----|------------------------------------|
| 01 | RGB-D camera and AI-based Leaf Detection | 04 | Approx 8Hrs of operation |
| 02 | Industrial-Grade Robotic Manipulator | 05 | Leaf-Safe Gripping and Cutting |
| 03 | Powered from 24V,100Ah battery | 06 | Remote Monitoring with HMI Control |

PHONE NUMBER:
033-2357-3950

DEVELOPED UNDER PROJECT:

TULIP: TEA HARVESTING UNMANNED ROBOTIC PLATFORM FOR
NORTHEAST INDIAN TEA PLANTATION

DEVELOPED BY

