



ICAR NATIONAL INSTITUTE OF SECONDARY AGRICULTURE

e-newsletter



Director's Desk

The past quarter has been marked by a series of meaningful academic, capacity building, and outreach activities at ICAR-NISA. The institute also made notable progress in research and development. Ongoing studies on developing pine rosin-based edible ink for printing applications on fresh fruits, characterization of minor exudate gums, resin- and tamarind gum-based adhesives, extraction of lignin from *Lantana camara*



stem, and ultrasonic-assisted extraction of lac dye are the testimonials to this. Efforts are also underway to establish a pilot plant for guar gum protein isolate, along with suitable equipment for cinchona debarking. We are also made dedicated efforts to promote translational research in secondary agriculture.

The institute also organized several events, including observance of Vigilance Awareness Week and Rashtriya Ekta Diwas, as well as farmer-centric programmes such as Kisan Diwas, International Women's Day, live streaming of major Government of India initiatives, on-farm trainings, and field visits. These activities reflect the institute's commitment to transparency, national unity, and the welfare of farmers and women.

The outputs of our research and outreach efforts have led to several publications and awards, while the active participation of scientists in national and international scientific forums has further enhanced the institute's visibility and recognition.

I sincerely appreciate the dedicated efforts of the scientific, technical, and administrative staff in successfully implementing these programmes. I also acknowledge the cooperation of farmers and partner organizations. Together, we shall continue to work toward strengthening secondary agriculture and promoting sustainable livelihoods.

With great pride, I present this quarterly newsletter before you.

(Abhijit Kar)

In this issue

- Research highlights
- Educational and capacity building programme
- Events
 - Vigilance awareness week
 - Rashtriya Ekta Diwas
 - Master trainer's training programme
 - Live streaming of national programmes
 - Hands-on training on Multivariate Analysis and Design of Experiments
- Publication & publicity
- Participation
- Awards/honors
- Visits
- HRD
- MoUs



RESEARCH HIGHLIGHTS

Pine rosin based edible ink for Fruit printing application

Edible ink formulations have been developed as sustainable alternatives to conventional stickers for fruit and vegetable labelling, eliminating the risks associated with harmful chemical adhesives used in stickers. Two ink systems have been evaluated: aqueous-based and solvent-based. Aqueous inks (pigments: lac, litmus, curcumin; binders: gum arabic, gelatin; plasticizers: glycerol, Tween 80) showed poor drying (>5 min) and poor font clarity (legibility 2.1 ± 0.3), making them unsuitable for printing on fresh fruits and vegetables. Solvent-based inks (ethanol medium; pigments: lac dye, litmus, curcumin; binders: rosin, shellac, ethyl cellulose, dammar gum; plasticizers: Tween 80, glycerol, PEG; TiO_2 as opacifier) performed better (drying time <5 s), while rosin enabling rapid film formation, lac dye providing strong colour, and PEG enhancing flexibility. Titanium dioxide improved opacity but compromised the rub and water resistance. Screening revealed rosin and lac dye concentrations significantly influenced performance ($p < 0.001$): rub resistance increased with rosin (5%: 12 cycles; 20%: 35 cycles), while lac dye improved readability (7% optimal; legibility 4.8 ± 0.2). The optimised formulation containing 15% rosin and 7% lac dye, demonstrated excellent printability on all tested fruit and vegetable surfaces (Fig. 1). Rub resistance was robust (no font loss after 20 cycles), but water resistance was limited, with colour leaching under tap water abrasion, leaving a faint impression (residual legibility: 1.8 ± 0.4).

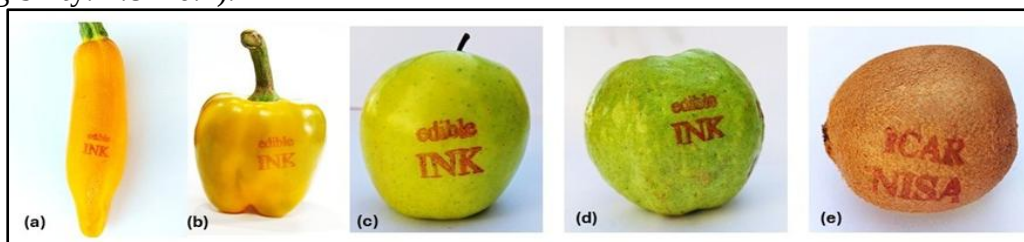


Fig 1 Stamping of optimized formulation on different fruits and vegetables (a) zucchini (b) yellow bell pepper (c) green apple (d) guava (e) kiwi

Comprehensive Rheological Characterization of Minor Exudated Gums

Natural hydrocolloids and plant-derived gums are increasingly gaining importance in the food, pharmaceutical, and allied industries due to the growing demand for sustainable, biodegradable, and clean-label ingredients. However, several indigenous minor exudated gums remain scientifically underexplored despite their abundant availability and potential functional properties. Minor exudated gums from moringa (*Moringa oleifera*), chironji (*Buchanania lanzan*), palas (*Butea monosperma*), and peach (*Prunus persica*) were systematically evaluated for their physicochemical and rheological properties. The gums exhibited variations in bulk density ($652\text{--}750\text{ kg/m}^3$), moisture content (8.2–17%), Carr index ($\sim 10\text{--}16.6\%$), and Hausner ratio (1.11–1.20), indicating differences in particle packing and hydration behaviour.

Steady shear rheological (Fig 2) studies showed that all gum dispersions followed non-Newtonian shear-thinning behaviour, well described by the Power law model ($R^2 > 0.98$). The flow behaviour index ($n = 0.20\text{--}0.65$) confirmed pseudoplasticity, while differences in consistency index (K) reflected variations in viscosity and thickening ability. Dynamic rheological measurements revealed viscoelastic weak gel-like characteristics with storage modulus (G') greater than loss modulus (G''). Temperature-dependent studies demonstrated a decrease in viscosity with increasing temperature, with activation energy for flow ranging from 12–37 kJ/mol. Moringa and peach gums exhibited comparatively higher viscosity and stronger intermolecular interactions. These findings highlight the potential of underutilised exudated gums as natural thickeners, stabilisers, and functional ingredients for food and allied industrial applications.

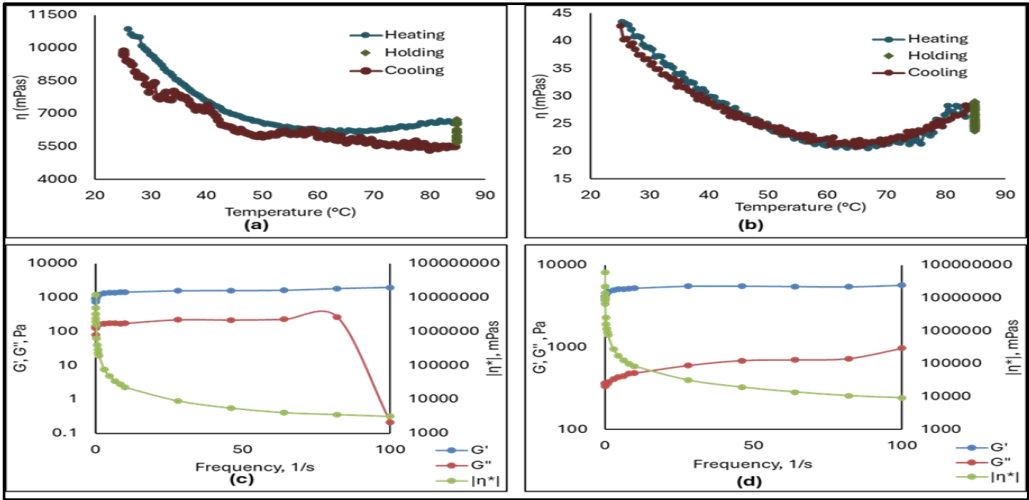


Fig 2 Temperature-dependent rotational rheology (a–b) and oscillatory viscoelastic behaviour (c–d) of gum dispersions: moringa gum (a, c) and peach gum (b, d)

Pilot scale preparation of guar meal protein isolate (GMPI)

Extraction of guar gum from endosperm produce high protein rich byproducts i.e., Guar Meal (GM), which contain high protein, about 32-52%. Therefore, extracting protein from guar meal can mitigate high demand of plant based protein products. Isolation of protein from guar meal has been standardised using acid-alkali precipitation method. Based upon the process protocol developed, a pilot scale unit (capacity: 10 kg /batch) has been developed for preparation of guar meal protein isolate. An extraction vessel (200 L) has been fabricated for extracting protein from the guar meal. It has the provision for controlling temperature, agitator speed and pressure (Fig 3). Other components for the plant such as pulveriser, tray dryer and basket centrifuge are adopted from the commercially available units.

A trial on pilot scale preparation of guar meal protein isolate (GMPI) has been conducted. The raw guar meal grinded in the pulveriser, has been extracted through alkali extraction process, at an solvent to guar meal powder ratio of 20:1, while continuously being stirred. The coagulated protein obtained so has been dried using tray and Refractive Window (RW) dryer for the production of guar meal protein isolate powder.



Fig 3 Pilot scale production of GMPI

In the trial run, 32% yield of GMPI with ~ 90% protein content has been obtained. The moisture content of the RW dried GMPI sample (4.33%) was lower than the tray dried sample (6.47%). The solubility for both samples (RW and tray dried) increased with drying temperature. Water holding capacity of the tray dried sample was higher (1.2%) than the RW dried sample (1.02%). No significant difference in colour parameters (L^* , a^* and b^* - values) has been observed between tray dried and RW dried samples.

Development of natural resin-based pressure sensitive adhesive

Tackifiers are used as one of the component in the formulation of pressure sensitive adhesives. Natural resins were chemically modified to function as tackifiers and subsequently used in the formulation and development of pressure-sensitive adhesives (PSAs). Various adhesive formulations were developed by reacting the resins with suitable modifiers under different temperatures and reaction times. Adhesive formulations were prepared in different colour shades from light yellow to dark brown (Fig 3a). Acid value of the prepared adhesives was found in the range of 6-88 (Fig 3b), indicating successful modification and variation in functional groups.

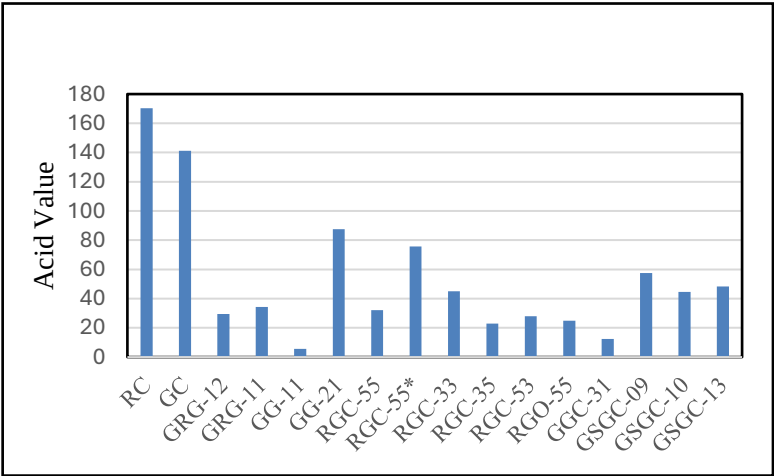


Fig 4 a) Different colour shades of adhesives, b) Acid values of different adhesive formulations

Adhesive strength of the developed PSAs was carried out pasting of two sheets of paper with the help of the adhesives. The adhesives prepared were applied on paper strips and dried at ambient temperature. The papers were adhered with another paper by pressing them together. Adhesive strength of the adhered papers was determined through Texture Analyzer. Force taken to peel the adhered paper strips was recorded to be in the range of 0.62-5.44 N, while the commercial surgical tape took 6.02 N for peeling of the paper strip (Fig 5).

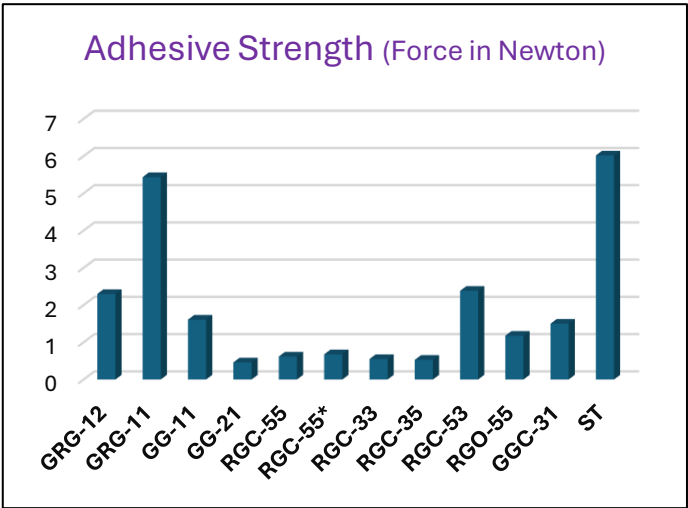


Fig 5 Adhesive strength of different adhesive formulations

In another set of experiments, solvent-based formulations recorded peel strength ranged from 2.45 N to 7.35 N, whereas aqueous formulations exhibited higher adhesion, with values between 7.35 and 8.82 N, indicating better performance (Fig 6 a,b).

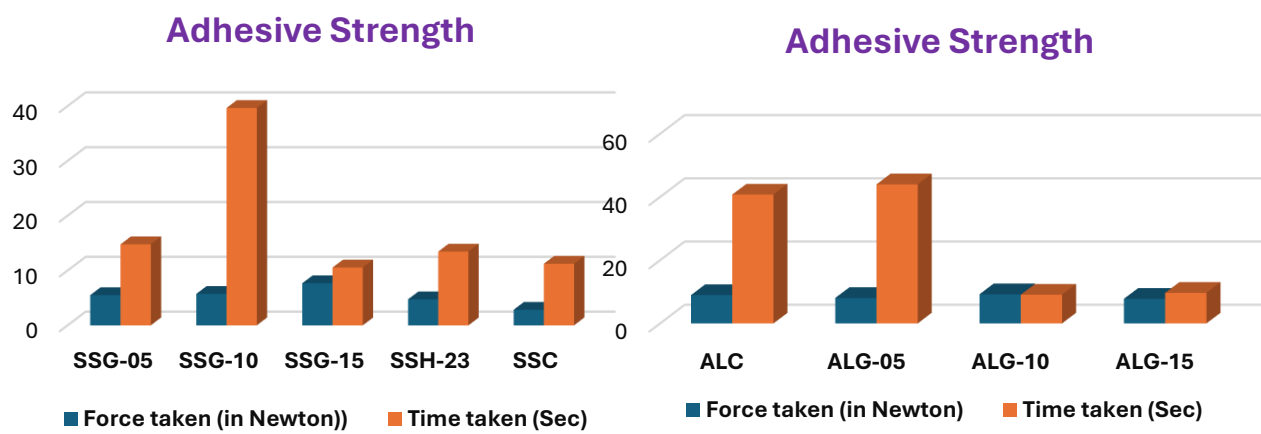


Fig 6 Adhesive strength of solvent based formulations (a), and aqueous formulations (b)

Tamarind gum-based eco-friendly paper adhesive

Tamarind gum (TG) possesses excellent film-forming and adhesive properties, yet its formulation optimisation for paper bonding applications remains scarcely investigated. This study reports the development of a thermally optimized TG-based adhesive through systematic evaluation of processing temperature and formulation parameters. A protocol for preparing TG based aqueous paper glue formulation has been developed. Various parameters, including TG concentration, heating conditions, pH-controlling compounds, surfactants, and preservatives, are optimised. To optimize viscosity and enhance gelation, the TG solutions were prepared through different protocols: room temperature (25 °C; RT-25), hot water (80 °C; HW-80), and cooked (90 °C; CK-90). These formulations were shortlisted and studied for their characteristics and adhesive strengths. The tensile strength tests of the 5% TKP adhesive formulations evaluated using a texture analyzer on wooden Sun-mica strips revealed an increase from 0.298 MPa (RT-25) to 0.50 MPa at (HW-80), with peak separation forces reaching 200 N. Rheological analysis demonstrated dominant elastic behaviour ($G' > G''$). Pull-off tests confirmed improved adhesion, leading to cohesive failure across multiple paper substrates.

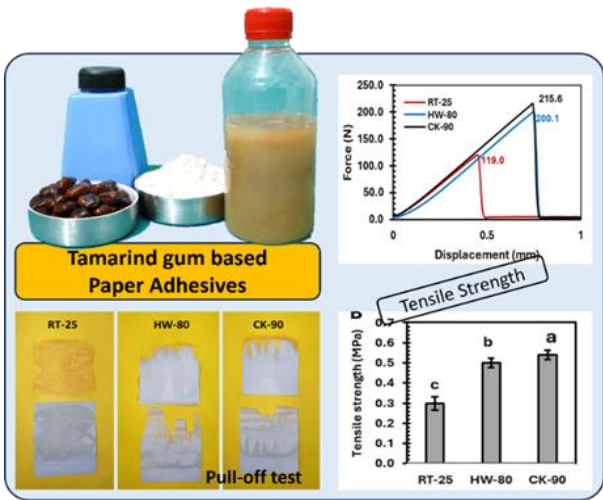


Fig 7 Tamarind gum-based eco-friendly paper adhesive

The optimised 5% TKP adhesive prepared at 80 °C (HW-80) demonstrated the best balance of high tensile strength and practical preparation, and provides a stable, high-strength, and sustainable alternative for paper bonding applications.

Lignin extraction from *Lantana camara* biomass

Lantana camara is an aggressive invasive weed that poses serious ecological and agricultural challenges by displacing native species and reducing soil productivity. However, its high lignocellulosic content makes it a potential feedstock for lignin extraction. Proximate chemical analysis of *Lantana camara* stem biomass revealed proportion of hemicellulose to be 19.17%, cellulose to be 37.00% and lignin to be 18.80%. Extraction of lignin from *Lantana camara* stem using Deep Eutectic Solvent (DES), at a solvent to biomass ratio of 8:1, and reaction temperature of 90 °C resulted in 76% lignin extraction efficiency (Fig 8). The purity of lignin was confirmed by UV-Vis and FT-IR characterisation.

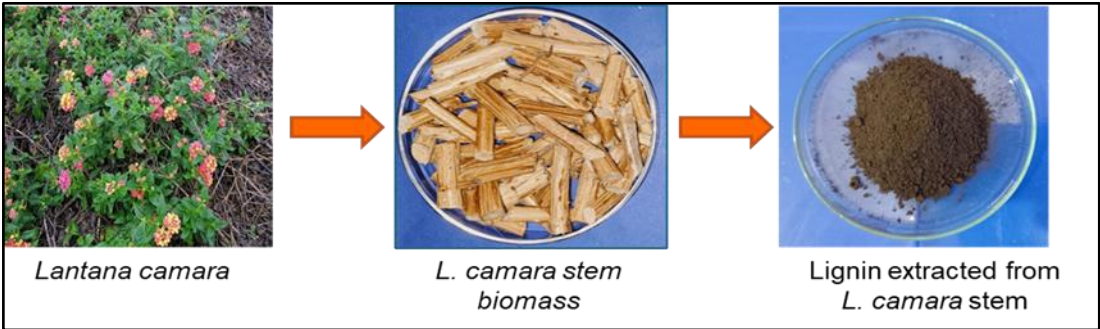


Fig 8 Lignin extracted from *Lantana camara* stem biomass

Ultrasonic-assisted lac dye extraction

Laccaic acid, a natural anthraquinone dye secreted from lac insects (*Kerria lacca*) is often discarded during washing or sold at lower price. Conventional chemical methods are used for extraction and purification of lac dye from the lac wash water, which are water intensive process. Ultrasonication is known to improve the extraction efficiency of biomaterial, as the acoustic waves cause structural modifications, while membrane filtration can separate products based on molecular size. To improve the extraction efficiency of lac dye experiments have been designed to wash the scrapped lac in an ultrasonic bath at different temperatures and time for a water ratio of 1:8. The lac wash water was characterised for protein profile, particle size and rheological properties. Protein samples from Kusum and *Flemingia semialata* grown lac insects were run after precipitation at 2.5 and 3.0 pH. It revealed a major protein band in the 35-48 kDa region, which falls well outside the targeted molecular weight range (< 1 kDa) paving the way for membrane filtration of lac dye and wax. The rheological characteristics revealed the viscosity of lac wash water with 1:8 ratio is 7 -12 cP. Particle size analysis reveals that the zeta potential varied between -18 to -27 V with mean at -22 V, while the hydrodynamic diameter of the particle present in lac wash water varied from 2329 to 22519 nm for ultrasound and alkaline treated lac samples.

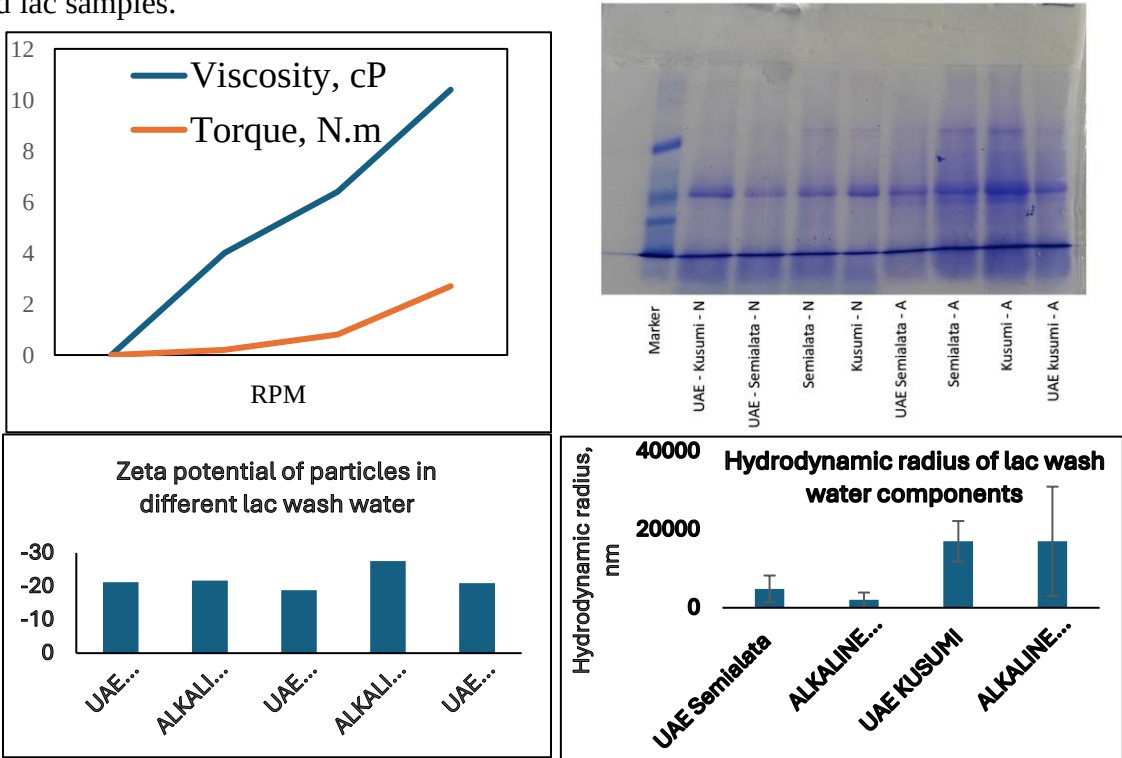


Fig 9 (a) viscosity of lac wash water (b)SDS-PAGE analysis, of lac, (c) zeta potential (d), hydrodynamic radius of lac samples under different treatments

Translational Research to promote Secondary Agriculture

The Markov chain–based transitional probability analysis was undertaken to assess export market dynamics by estimating the probability of retaining or shifting trade shares among importing countries over time. It helps identify stable and loyal export destinations, supporting strategic trade planning and market diversification decisions. The transitional probability matrix for Indian shellac and lac-based product exports during 2014–15 to 2023–24 showed that the USA (85%), Bangladesh (75%), and Germany (52%) were the most stable export markets, reflecting high retention probabilities. Similarly, for Indian guar gum exports, the USA (63%) and Germany (14%) emerged as relatively stable markets, indicating consistent trade relationships. As part of the ongoing research and extension activities, a need assessment survey was conducted among farmers to identify information requirements, preferred communication channels, and knowledge gaps. Simultaneously, an impact assessment of training programmes evaluated the adoption of scientific technologies in lac cultivation and documented major constraints faced by farmers. Data was collected from 200 farmers, including 150 trained and 50 control farmers, and analysed using Propensity Score Matching (PSM). The PSM results indicated that structured lac cultivation training significantly increased income, with the average treatment effect on the treated estimated at Rs. 92,716 for lac income and Rs. 1,23,752 for total household income. Beyond the Training effect two other covariates, i.e., lac cultivation experience and the family size exerted statistically significant and substantively interpretable effects on income growth.

Capacity building, Educational and Entrepreneurs programmes			
Sl. No.	Name of programme	No. of programme/ batch	No. of beneficiaries
1.	Farmers’ Training programme on “Scientific methods of Lac cultivation, primary processing and utilization”	09	809
2.	Master Trainers Training programme on “Scientific methods of Lac cultivation, primary processing and utilization”	01	72
3.	Master Trainers Training programme on “Foundation Training for Beekeepers	01	38
4.	One day training cum Exposure visit Programme	09	371
5.	Entrepreneurs programme	01	01
6.	Participation in Mela/Events	04	-

Entrepreneurs programmes (Technology/know-how transfer & training on process & products)

Sl. No.	Programme Name	Duration	Participants	Sponsoring agency
1	Technology/Know-how transfer & training on Primary processing of lac	12-15, January 2026	Mr Aditya Agrawal of Shakti, Chhattisgarh	Self-financing

List of MOU signed by ICAR-NISA, Ranchi

Sl. No.	Title/Purpose	MoU signed between	Date of signing MoU	Valid up to
1	Collaboration w.r.t. project for establishment of High-Density Lac Brood Bank with advanced support systems at KVK, Khunti of ICAR-NISA, Ranchi	ICAR-NISA and Sidhokanho agriculture and forest produce state co-operative federation limited, Kanke Road, Ranchi, Jharkhand	28.02.2026	28/02/2036

Agribusiness incubation at ABI Centre, ICAR-NISA, Ranchi

Sl. No.	Date of start & Duration (Yrs)	Category	Name of incubatee	Technologies for incubation
1	12.02.2026 (01 Year)	Firm/ Company	Mr. Samual Tilo Bage, Aniska Agro Products, Hatia, Ranchi	Aleuritic acid and Isoambrettolide

Field Visits

Dr. Uday kumar, M. S., Scientist (Agril. Economics) conducted a field visit to Mr. Narayan Bedia farm in Tirla Kocha village, Panchayat-Rajadera, Block-Angara, Ranchi-Jharkhand on 23rd January, 2026 and documented the success story and video preparation is done and shared in institute social media platform and also visited the Rampur lac market for collecting market information on lac and lac-based products.



On farm training cum Field Visit

As part of Masters trainers training programme, Field visit cum on farm training on scientific lac cultivation was organized on 11th January 2026 at Jerki Toli, Panchayat- Rajaulatu, Block- Namkum, Ranchi-Jharkhand. Progressive farmers from Jerki Toli village, Master trainers', SIDHKOFED staff and ABD Unit staff, ICAR-NISA participated in the programme.



Success story Videos Documented and shared in social media (01):

- Success story of Shri Narayan Bedia was documented and uploaded in all the institute social media platform (<https://www.youtube.com/watch?v=thJgGoEUfe4&t=93s>)

Technology Dissemination Using Social media platform

As part of translational research and outreach efforts to promote secondary agriculture, four short videos, i.e. Synergistic Benefits of Beekeeping in Lac-Based Farming Systems, Beekeeping and It's training, Strawberry Bites: Goodness of strawberries all year round and Agronomic Interventions to increase Lac yield on semialata, disseminated through the Institute's social media platforms. In addition, success story of one progressive lac farmer was recorded to showcase the impact of scientific lac cultivation on income enhancement and livelihood improvement. Success story videos already shared on social media, are serving as effective knowledge dissemination tool to encourage wider adoption of scientific lac cultivation practices among farmers.



Training and Exposure visits Photos

Live streaming webcast of the 22nd PM-KISAN Instalment release programme

ICAR–NISA, Ranchi organized a live streaming webcast of the 22nd PM-KISAN instalment release programme on March 13, 2026. About 200 farmers from Ranchi, Khunti, and surrounding districts participated in the programme along with the institute staff. The event provided farmers with an opportunity to directly witness the release of financial assistance under the PM-KISAN scheme and understand its significance in supporting farmers income. During the programme, awareness was also created about various government initiatives aimed at enhancing agricultural productivity and farmers' welfare.





Kisan Mela and Agricultural Exhibition 2026 (8th and 09th March, 2026)

The ICAR–National Institute of Secondary Agriculture (NISA), Ranchi, organized the Inaugural Programme of the Kisan Mela-cum-Agricultural Exhibition 2026 on March 8, 2026. Dr. Abhijit Kar, Director, welcomed the dignitaries and highlighted the institute's achievements and ongoing initiatives. The programme was graced by the Chief Guest, Smt. Shilpi Neha Tirkey, Hon'ble Minister of Agriculture, Animal Husbandry & Cooperation, Government of Jharkhand, while Shri Aboobacker Siddique P. attended as Guest of Honour. The primary objective of the mela was to empower and educate the farming community of Jharkhand on modern agricultural technologies, sustainable practices, and innovative approaches. Progressive farmers, entrepreneurs, and startups were felicitated during the inaugural session. In her keynote address, the Hon'ble Minister emphasised the adoption of integrated farming systems for income diversification and livelihood security, and appreciated the vital role of women farmers, encouraging them to become self-reliant agri-entrepreneurs. The mela featured over 40 exhibition stalls representing ICAR institutes, KVKs,

FPOs, SHGs, NGOs, and government departments, showcasing best practices and innovations across agriculture and allied sectors. Kisan Gosthis (farmer-scientist interactions) were conducted on diverse themes, including scientific lac cultivation, integrated cropping systems, beekeeping, natural farming, crop diversification, farm mechanization, nutrient management, animal husbandry, mushroom and fisheries production. The Valedictory Programme was held on March 9, 2026, with Dr. Amit Pandey, Director, ICFRE–Institute of Forest Productivity, Ranchi, and Dr. S. Balasaraswathi, Director, Central Tasar Research and Training Institute, Ranchi, as Guests of Honour. Progressive farmers were felicitated, and Best Stall Awards were presented for outstanding exhibits during valedictory programme. Overall, the mela benefited approximately 3,000–4,000 farmers, serving as an effective platform for



knowledge dissemination and stakeholder interaction.



International Women's Day celebration

ICAR–NISA organized a two-day Kisan Mela on 8 March 2026 to commemorate International Women's Day, inaugurated by Smt. Shilpi Neha Tirkey, Hon'ble Agriculture Minister, Government of Jharkhand. The event drew about 1,500 farmers daily, roughly 80% women, highlighting women's vital role across

production, processing, value addition, and marketing. The mela facilitated meaningful exchanges among farmers, scientists, extension workers, and rural entrepreneurs on improved practices, processing techniques, packaging, branding, and market linkages. A vibrant exhibition featured stalls run by women entrepreneurs and self-help groups showcasing value-added products from millets, lac, mushrooms, jackfruit, aonla, and assorted fruits and vegetables—millet snacks, honey, pickles, chutneys, herbal items, and nutritious mixes. Awards recognized outstanding contributions: Smt. Sushila Devi (Excellent Farmer), Mrs. Pushpa Rani Tirkey and Smt. Ujala Devi (Excellent Agri-Entrepreneurship), and Smt. Premika Guria (Excellent Agro-based Startup). Staff activities, including rangoli, an innovative jackfruit recipe contest, and an agriculture–nutrition quiz, encouraged creativity. The mela reinforced ICAR–NISA's commitment to gender-inclusive, sustainable rural development.



Research Advisory Committee (RAC) Meeting

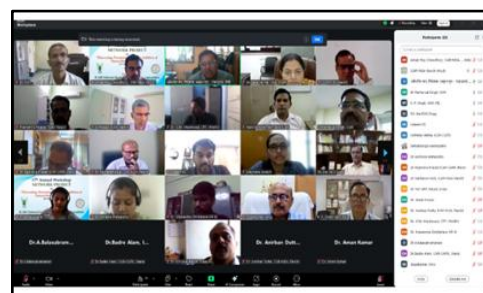
The XXXII meeting of the Research Advisory Committee (RAC) of ICAR-NISA (first meeting of the current RAC constituted vide the council letter F. No. A.Engg./5/5/2025(A.E); e-file 369096; dated 19.08.2025) was held during March 23-24, 2026 at ICAR-NISA, Ranchi in hybrid mode. The meeting was chaired by Dr. V Geethalakshmi, former Vice Chancellor, TNAU, Coimbatore. The Members present in the meeting were Dr. K.P. Singh, ADG (FE), ICAR, New Delhi, Dr. K.K. Singh, Former ADG (FE), ICAR, New Delhi, Prof. Arun Kumar Padhi, Dean (R&D), Central University of Jharkhand, Ranchi, Dr. H. S. Sidhu, Principal Scientist, PAU, Ludhiana, Dr. Bikash Das, Director, ICAR-NRC on Litchi, Muzaffarpur and Dr. R.T. Patil, Former Director, ICAR-CIPHET, Ludhiana, Dr. Abhijit Kar, Director, ICAR-NISA, Ranchi and Dr. S.K. Giri, Head & Member Secretary. Besides the members, all the HODs, Scientists of ICAR-NISA, Ranchi and I/c KVK, Khunti also participated in the meeting on the suggestion of RAC Chairman. The RAC deliberated on the work in progress and thrust areas of research to be undertaken in coming years (2026-31) keeping in view the mandate and vision of the Institute, and made recommendations.



The XXXII RAC meeting at ICAR-NISA

Annual Review Workshop of the Network Project on HPVA of NRG

The 17th Annual Review Workshop of “Network Project on Harvesting, Processing and Value Addition of Natural Resins and Gums” (NP-HPVA of NRG) was held on March 13, 2026 through online video conference mode to review the annual progress (2025-26) of the on-going/concluding projects at different centres. The workshop was chaired by Dr. S.N. Jha, DDG (Engineering), ICAR, New Delhi. Dr. K. P. Singh, ADG (Farm Engineering) and Dr Panna Lal Singh, Pr. Scientist attended the same from the ICAR headquarter. Dr. Abhijit Kar, Director ICAR-NISA, Dr. S. K. Giri, PC, NP- HPVA on NRG, and all the PI's, Co-PI's and other staff of the lead and co-operating centres attended the meeting. The workshop began with the inaugural session, followed by technical sessions in which the PIs of the Network Cooperating centres presented the progress made during Jan.-Dec., 2025.



The 17th Annual Review Workshop of the Network Project on HPVA of NRG being held in online mode

ICAR-NISA participated in Tournament for Eastern Zone (TEZ-2025)

ICAR-NISA Ranchi participated in the ICAR Zonal Sports Tournament for the Eastern Zone (TEZ-2025) from 06 to 09 January 2026, organized by the ICAR–Central Institute for Freshwater Aquaculture (CIFA), Bhubaneswar.

22 ICAR institutes from across the Eastern Zone participated in the tournament. The contingent from the institute actively competed in various athletic events, including 100 m, 400 m, 800 m, and 1500 m races, long jump, cycle race, shot put, discus throw, and javelin throw. Participation also included team events such as cricket, football, badminton, table tennis, volleyball (smashing and shooting), as well as indoor games like carom and chess.

The institute's contingent delivered an excellent performance, securing first position (Gold Medal) by Shri Kartik Mahto, LDC in the 800 m and 1500 m races, and third position (Bronze Medal) by Bri Raj Sharma, SMS, KVK, Khunti, in the 400 m race. A total of 31 members from the institute participated in the tournament, comprising 28 male and 3 female participants. The sporting events were conducted primarily at the Kalinga Stadium, Bhubaneswar.



Contingents of ICAR-NISA in TEZ-2025 organized at Bhubaneswar

Three-Day Training under Rashtriya Karmayogi Programme

A three-day residential training programme under "Mission Karmayogi" was organized at ICAR–National Institute of Secondary Agriculture, Namkum, Ranchi from 29.01.2026 to 31.01.2026. All the staff of the Institute including scientific, technical, administrative, and supporting categories. The programme was inaugurated by Dr. Abhijit Kar, Director, ICAR-NISA. Training Module is in blended mode (digital + offline) based on the iGOT Karmayogi Portal. All employees of the Institute completed the training and passed the assessment test on iGOT. The training programme was highly successful in bringing a positive change in the outlook and work efficiency of the employees. Inspired by the spirit of "Rashtriya Karmayogi", the Institute is now committed to providing faster, transparent, and technology-enabled services to farmers



Participants and organizers of the Rashtriya Karmayogi Programme.

Outcome Review Meeting held on March 14, 2026

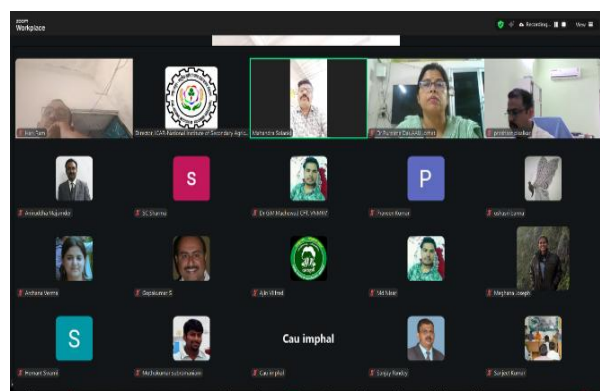
The Outcome Review Meeting under the Central Sector Scheme of ICAR was held on March 14, 2026, at ICAR–National Institute of Secondary Agriculture (ICAR-NISA), Namkum, Ranchi, to review the achievements and impact of the institute and its network projects during the 2021–26 review period. The meeting was attended by Dr. G. S. Tiwari, Coordinator, Arpan Seva Sansthan, Jaipur, and his team; the Director of ICAR-NISA; Heads of Divisions; Project Coordinators of the network projects; Administrative and Finance Officers; and progressive farmers and entrepreneurs, both offline and online.

The meeting began with a welcome address by Dr. Abhijit Kar, Director, ICAR-NISA, who welcomed the review team, scientists, officials, farmers, and entrepreneurs participating in hybrid mode. He noted that the institute had recently undergone a change and expansion in its mandate, which had broadened the scope of work in secondary agriculture, and requested the review team to identify gaps and suggest improvements. Dr. G. S. Tiwari appreciated the efforts made by the institute in implementing the objectives of the scheme and expressed confidence that the review would provide valuable insights into its achievements and activities. Dr. S. M. Mathur further advised that the presentations should emphasize the technologies developed by the institute and their field-level impact.

Dr. S. C. Sharma, In-charge, PME Cell, presented an overview of the institute's major achievements during 2021–26. Dr. Niranjana Prasad, Project Coordinator of the Network Project on Conservation of Lac Insect Genetic Resources, presented the progress and achievements of the project, while Dr. S. K. Giri, Project Coordinator of the Network Project on Harvesting, Processing and Value Addition of Natural Resins and Gums, highlighted its accomplishments during the same period.

An interaction session with stakeholders was also held in hybrid mode. Around thirty farmers from Jodhpur, Raipur, Imphal, Guwahati, Palamau, Khunti, Ranchi, Purulia, and other parts of India participated online, while several progressive farmers attended in person. The representatives from Arpan Seva Sansthan, Jaipur expressed satisfaction with the efforts of the scientists and officials of ICAR-NISA and acknowledged the institute's contributions to research, technology development, and extension activities.

After the meeting, the representatives visited the divisions, laboratories, and facilities of the institute to gain a broader understanding of its infrastructure and ongoing research initiatives. Dr. Santosh Kumar Singh Yadav, Scientist, proposed the vote of thanks, and the meeting concluded thereafter.



Review team interacting with scientists and stakeholders.

Republic Day Celebrated at ICAR-NISA, Ranchi

The 77th Republic Day was celebrated with patriotic fervour at ICAR–National Institute of Secondary Agriculture (ICAR-NISA), Namkum, Ranchi. The programme commenced with the unfurling of the National Flag by Dr. Abhijit Kar, Director, ICAR-NISA, in the presence of scientists, staff members, retired employees, contractual staff, and their family members.

Addressing the gathering, Dr. Kar highlighted the significance of Republic Day and the implementation of the Constitution of India. He emphasized the values of unity, integrity, and collective responsibility towards nation-building, and urged everyone to uphold the constitutional ideals in their daily lives. The celebration witnessed enthusiastic participation from members of the ICAR-NISA community and concluded with the National Anthem.



Publication and Publicity

Research Paper

- Cherwoo L, Sharma A, Das S, Thombare N, Bhondekar AP, Kumar R, and Kumar S. 2026. A novel shellac-based material for bitterness reduction and bacterial growth inhibition in caffeinated beverages." *European Food Research and Technology* 252, no. 3 (2026): 112.
- Edde M, Mohapatra D*, Kate A, Naik R, Tripathi MK, Singh KP. 2026. Comparative analysis of various pretreatments vis-à-vis Infrared heating on some selected quality characteristics of kodo millet. *Journal of Food Measurement and Characterization*, 20, 730–741. DOI: 10.1007/s11694-025-03611-0
- Manik S, Mohapatra, D*, Kate A, Giri SK, Tripathi MK, Singh K, Bhushana. Babu V. 2026. Application of ANN for assessment of protein content, fat content and rancidity indicators as affected by the storage conditions and *Rhizopertha dominica* infestation in pearl millet. *Journal of Food Measurement and Characterization*, 20, 310–320. <https://doi.org/10.1007/s11694-025-03592-0>
- Sharma SC, Pandey SK, Prasad N, Raj H, Giri SK, Kar A. (2026). Design and performance evaluation of a manual blazer for sustainable Karaya gum production from *Sterculia urens*. *Bioresource Technology Reports*, 33, 102509. <https://doi.org/10.1016/j.biteb.2025.102509>.
- Thombare N, Dutta, A, Mahto A., Roy Chowdhury A., Hari D , Ansari MF and Kar A. A simple, convenient, and statistically optimized method to determine the solubility of polysaccharide gums: Guar gum and beyond. *Polymer Bulletin* (2026) 83:213. <https://doi.org/10.1007/s00289-026-06292-x> (NAAS 2026: 10)

Books Chapter

- Cherwoo L, Kumar S, Sharma A, Thombare N, Kumar R, Bhondekar AP, Gupta V, Gaur V, Ghaisas N. (2026) Bitterness Modulation in Green Tea with Shellac: A ChemFET Sensor-Based Approach. In: Pal, S., Malhotra, S., Gupta, I., Kumar, A. (eds) Emerging Technology and Sustainable Solutions. (ICETSS 2024). CCIS vol 2611, pp 168–182. Springer, Cham.
- Nickhil C., Chakraborty SK, Mohapatra D, Bhukya J. 2026. Ozone: A New Stored Product Insects Control Strategy for Pulse, Chapter 5 in in Ozone Applications in the Food Industry: Trends and Future Prospects, Edited By Ravi Pandiselvam, Anjineyulu Kothakota, Kaavya Rathnakumar. 1st Edition, Apple Academic Press , Pp: 135-157 eBook ISBN9781003609827
- Bhukya J., Lata D, Nickhil C, Mohapatra D, Pandey R, Sravan T, Ghosh T. 2026. Application of Ozone in Seed and Sprouts Processing, chapter 11 in Ozone Applications in the Food Industry: Trends and Future Prospects, Edited By Ravi Pandiselvam, Anjineyulu Kothakota, Kaavya Rathnakumar. 1st Edition, Apple Academic Press , Pp: 295-314 eBook ISBN9781003609827
- Warepam S.C., Lyngwa A.C., Susmita L., Bhukya J. 2026. Ultrasonication Treatment to Food Waste Management, Chapter 11 in Food Waste Valorization and the Circular Economy, Edited By Sajad Ahmad Mir, Gitanjali Behera, and Leo M.L. Nollet. 1st Edition, CRC Press, Boca Raton, eBook ISBN: 9781003590156

Popular Articles

- Udaykumar M. S., S. K. Pandey, Arbind Kumar Mahto and Dinesh Kumar. 2026. From Subsistence to Sustainability: Philip Madki's Success Story of Scientific Lac Cultivation in Jharkhand. *The Agriculture Magazine*, 5 (6); 334-336. (E-ISSN: 2583-1755).
- Udaykumar M. S. and S. K. Pandey. 2026. From Daily Wage Labourer to Lac Farmer: The Inspiring Journey of Shri Chandan Beena. *Agriculture and Food E Newsletter* 8 (2); 411-413. (ISSN: 2581-8317)

Folders

- प्रियंका साकरे, नंदकिशोर ठोंबरे, अर्चना महापात्र, अचिंत्य प्रमाणिक, अभिजित कर. स्ट्रॉबेरी बाइट्स: स्ट्रॉबेरीका स्वाद सालभर. भाकृअनुप – राष्ट्रीय कृषि उच्चतर प्रसंस्करण संस्थान, नामकुम, रांची. 2026. पृष्ठ 1-4. प्रकाशन संख्या NISA/2026/LH/01.
- Priyanka Sakare, Nandkishore Thombare, Archana Mahapatra, Achintya Pramanik and Abhijit Kar. Strawberry bites: Goodness of strawberries all year round. ICAR- National Institute of Secondary Agriculture, Namkum, Ranchi. 2026. Page 1-4. Publication No. NISA/2026/LE/02

Patents filed

- Patent application filed for “Novel Electric Bhatta for Button Lac Production” (Application No. 202631030510) on 13 March 2026 with complete specification by S. Kale, S.K. Pandey, S.K. Giri, and Abhijit Kar.
- Patent application filed for “Horizontal Uprooting Equipment for Uprooting Cinchona Trees in Hilly Terrain” (Application No. 202631032975) on 18 March 2026 with complete specification by S.C. Sharma, S.K. Pandey, N. Prasad, and Abhijit Kar.

HRD

Hands on training on SolidWorks

- A hands-on training program was organized at NISA in collaboration with ELMAX PVT. Ltd. on SolidWorks for the scientists, students and technical officers. A total of 9 candidates participated in the two days hands on training program including Drs A. Mahapatra, S. Kale, P. Sahu, Ers R. Prakash, JN Sharma, Ms. Fahmidha, Er B Sahu and Mr V Kumar and Vikas; the lectures were followed by hands on practical exercises.



Participation in Seminar/Symposia/Conference/Workshop/Meeting

- Dr. Udaykumar, M. S. participated in annual zonal workshop of KVKs organized by ICAR-ATARI, Zone -IV, Patna from 17-19, January, 2026 at ICAR-NISA, Ranchi and presented the latest technologies generated/released by ICAR-NISA, Ranchi for Bihar and Jharkhand.
- Er. S.K.Pandey participated in online meeting w.r.t. new Agribusiness Incubation Centre at ICAR-NISA, Ranchi in Tenth Inter-Ministerial Empowered Committee (IMEC) held on 12.01.2026 organised w.r.t. the proposals under the Pradhan Mantri Formalization of Micro Food Processing Enterprises (PMFME) scheme of the Ministry of Food Processing Industries.
- Er. S.K.Pandey attended one day workshop on “ Minor Forest Produce collection and value addition” organized by SIDHKOFED, Ranchi at Palash Bhawan, Ranchi on 28.02.2026

Recognition

- ICAR–NISA, Ranchi stall secured the Second Prize among ICAR institutes at the Agrotech Krishi Mela 2026 organized by Birsa Agricultural University (BAU), Ranchi.
- ICAR–NISA, Ranchi stall secured the best stall award at the Kisan Mela 2026 organized by KVK, Gumla at Bishunpur.

Training Attended

- Smt. Kumudini Kachhap, UDC attended online pre- examination training for limited departmental competitive examination for the post of Assistants in ICAR system, organized by ICAR-NIASM, Baramati, Pune, Maharashtra on 2nd and 30th January, 2026.
- Shri Krishna Murari Kumar, AAO attended training cum workshop on Prevention, Prohibition and Redressal of Sexual Harassment of Women at workplace at ISTM, Delhi on 5-6th January, 2026.
- Abhishek Kumar, Assistant recruited under Direct Recruitment Quota attended orientation training programme for the Assistant (Phase - I of Module-I) on 2-6th February, 2026 at ICAR-NISA, Ranchi.
- Harshvardhan Bux Rai, Assistant, ICAR-IIAB recruited under Direct Recruitment Quota attended orientation training programme for the Assistant (Phase -II of Module - I) on 16-20th February, 2026 at ICAR-NISA, Ranchi.

Joining

- Sh. Abhishek Kumar, Assistant: 22.01.2026
- Sh. Satyanarain Kumar Hembram, LDC (on deputation): 28.03.2026

Retirement



Mr. Luis Ekka receiving a Certificate of Service during his superannuation ceremony.



Shri Luis Ekka
MTS
31.01.2026



Mr. Paulus Ekka receiving a Certificate of Service during his superannuation ceremony.



Shri Paulus Ekka
MTS
31.03.2026

Editor-in-chief

Dr. Debabandya Mohapatra

Editor

Dr. Arnab Roy Chowdhury

Technical Assistance

Mr. Indrajeet Kumar

Published by

Dr. Abhijit Kar, Director

ICAR-National Institute of Secondary Agriculture, Namkum, Ranchi - 834 010, Jharkhand

Phone: 0651-2260117, 0651-2261156 (Director)

Fax : 0651-2260202

E-mail: director.nisa@icar.org.in, director.icar.nisa@gmail.com

URL : <https://nisa.icar.gov.in>