

RFAs for Commissioned Research Projects under EFS

1. General Guidance for Applicants:

The Endowment Fund Secretariat (EFS), University of Agriculture, Faisalabad invites concept notes for commissioned research addressing priority agricultural problems identified through stakeholder consultation and subsequent expert committee deliberations. The purpose is to support practical, evidence-based and field-relevant solutions rather than generic investigator-driven proposals. The RFAs define priority problems, not rigid methods. Applicants may propose innovative approaches, provided that the proposed work directly addresses the stated problem, includes measurable deliverables, and demonstrates a credible pathway to field, industry, policy or commercialization impact.

2. Common Design Principles:

- Problem first: proposals must respond to the specific commissioned problem.
- Outcome focused: each project must deliver usable outputs, not only publications.
- Field validation: laboratory or model outputs should be tested under relevant field or stakeholder conditions wherever applicable.
- Multidisciplinary collaboration: teams should combine scientific, technical, extension, farmer, industry and policy expertise as needed.
- No duplication: applicants should clearly state existing work, available technologies and the specific gap being addressed.
- Adoption pathway: every proposal must explain who will use the results and how the outputs will reach farmers, industry, extension or policymakers.
- Concept note format/proforma is available at website: <https://efs-uaf.org/download.php>, Sr. No. 22 or can be requested through E-mail.

3. Common Eligibility and Conditions:

- Eligibility shall be as per EFS rules and the specific RFA. Multidisciplinary consortia are encouraged.
- Applicants should demonstrate relevant expertise, facilities, research in hand and institutional capacity.
- Collaboration with public research institutions, extension departments, progressive farmers, industry, seed companies, diagnostic laboratories, machinery/service providers or private farms is encouraged where relevant.
- Major equipment purchase should be minimized unless technically justified and approved under EFS guidelines.
- Committee members who developed an RFA shall not apply as PI or Co-PI in the same commissioned RFA prepared by their respective committee.
- All data, IP, technology transfer and commercialization matters shall be handled according to UAF/EFS/ORIC policy and the approved award agreement.

4. Common Monitoring Framework:

- Inception meeting and approved implementation plan after award.
- Six-monthly technical progress reports and annual financial utilization reports.
- Field/site visits by EFS/ORIC/technical reviewers where applicable.
- Mid-term technical review for continuation, course correction or discontinuation.
- Final technical evaluation against approved deliverables, KPIs and impact pathway.
- Mandatory submission of technical report, policy/extension note and public-facing summary at completion.

5. List of Standardized RFAs:

RFA No.	Title
RFA-01	Strengthening Cotton Seed Quality, Genetic Purity and Traceability for Cotton Revival
RFA-02	Integrated Management of Cotton Leaf Curl Disease and Whitefly in the Punjab Cotton Belt
RFA-03	Etiology, Surveillance and Management of Cotton Red Leaf, Red Stem and Wilt Complex
RFA-04	Climate-Resilient Cotton Variety Development through Functional Markers, Genomics and Multi-Location Screening
RFA-05	District-Specific Cotton Revival Packages: Seed, Sowing Window, Pest, Water and Advisory Integration
RFA-06	Cotton Mechanization and Precision Tools Package for Smallholder Production Systems
RFA-07	Digital Agriculture and AI-Based Advisory Systems for Cotton-Wheat and Rice-Wheat Regions
RFA-08	Edible Oil Crop Diversification in Cotton-Wheat Systems to Reduce Import Dependence
RFA-09	Water Productivity and Groundwater-Safe Irrigation in Cotton-Wheat and Rice-Wheat Systems
RFA-10	Drought, Heat and Rust Resilient Wheat for Rainfed and Late-Sown Environments
RFA-11	Wheat Yield-Gap Reduction through Marker-Assisted Breeding, Rapid Generation Advancement and AI-Based Early Warning
RFA-12	Integrated Approach for Enhanced Productivity and Sustainability in Dairying

RFA-01: Strengthening Cotton Seed Quality, Genetic Purity and Traceability for Cotton Revival

Applicants should treat the scope below as indicative. Innovative, evidence-based alternatives are encouraged if they clearly address the commissioned problem and deliver measurable outputs.

Problem focus: Cotton revival will remain weak if farmers do not receive true-to-type, high-germination and genetically pure seed of adapted varieties. Seed adulteration, varietal mixing, weak multiplication chains, limited genetic-purity testing and inadequate traceability reduce plant stand, varietal performance and farmer confidence.

Overall objective: To develop and validate a practical cotton seed quality assurance and traceability model covering seed production, processing, genetic purity testing, certification support and farmer-level verification.

Indicative Scope of Work:

- Assess seed quality, genetic purity and varietal identity across representative cotton seed lots and production areas.
- Strengthen protocols for breeder, foundation and certified seed production, handling, processing and storage.
- Develop or validate molecular/marker-based varietal purity testing and lot authentication protocols.
- Pilot a simple digital traceability and verification mechanism, preferably linked to seed lot, producer and distribution channel.
- Compare field performance of verified/certified seed with prevailing farmer seed sources.
- Recommend improvements in seed certification, labeling, quality surveillance and accountability mechanisms.

Expected Deliverables:

- Seed quality and genetic purity assessment report for representative cotton-growing areas.
- SOPs for cotton seed production, processing, storage and lot handling.
- Validated protocol for varietal identity/genetic purity testing.
- Pilot seed traceability model suitable for seed companies, certification agencies and farmers.
- Field evidence comparing verified seed with commonly used seed sources.
- Policy and extension brief on cotton seed quality assurance.

Suggested Performance Indicators:

- Seed lots tested for germination, vigor, purity and varietal identity.
- Operational pilot traceability system demonstrated on selected seed lots.
- At least two stakeholder trainings involving seed producers, extension/certification staff and farmers.
- Evidence of improved plant stand or field performance from verified seed lots.
- Policy note submitted to EFS/UAF/relevant seed regulatory stakeholders.

Preferred team/stakeholder linkage: Seed science, plant breeding/genetics, molecular markers, seed certification, agronomy, ICT/traceability, seed companies and extension stakeholders.

Indicative duration: Up to 24 months.

Budget framework: As per EFS ceiling; applicants should provide a need-based budget and minimize major equipment.

RFA-02: Integrated Management of Cotton Leaf Curl Disease and Whitefly in the Punjab Cotton Belt

Applicants should treat the scope below as indicative. Innovative, evidence-based alternatives are encouraged if they clearly address the commissioned problem and deliver measurable outputs.

Problem focus: Cotton Leaf Curl Disease (CLCuD) and whitefly remain major interconnected constraints to cotton productivity. Management is often reactive and pesticide-centered, while resistance, vector dynamics, climate effects, varietal tolerance and extension advisories are not sufficiently integrated.

Overall objective: To develop and validate an integrated, district-relevant Cotton Leaf Curl Disease and whitefly management package combining surveillance, tolerant germplasm, vector management, resistance management and timely advisory.

Indicative Scope of Work:

- Map CLCuD incidence, whitefly populations and key agro-climatic drivers in representative cotton districts.
- Screen available varieties/lines for field tolerance to CLCuD and whitefly pressure.
- Assess insecticide resistance risk and propose rotation/resistance-management guidance.
- Develop ETL-based and weather-informed advisory protocols for farmers and extension workers.
- Integrate cultural, biological, chemical and ecological management options into a practical IPDM package.
- Validate the package through farmer fields or demonstration sites.

Expected Deliverables:

- District-wise surveillance/risk maps for CLCuD and whitefly.
- List of tolerant/relatively tolerant varieties or germplasm with supporting field data.
- Integrated pest and disease management package for cotton growers.
- Resistance-management and pesticide-use advisory protocol.
- Farmer/extension manuals and policy note.
- Validated demonstration results from representative sites.

Suggested Performance Indicators:

- Reduction in whitefly pressure or CLCuD incidence in demonstration plots compared with farmer practice.
- Number of districts/sites monitored and mapped.
- Number of varieties/lines screened under field pressure.
- Reduction in unnecessary pesticide sprays through advisory-based decisions.
- Farmers/extension staff trained and advisory material disseminated.

Preferred team/stakeholder linkage: Plant pathology/virology, entomology, cotton breeding, agronomy, GIS/ICT, pest warning, extension and progressive farmers.

Indicative duration: Up to 24 months.

Budget framework: As per EFS ceiling; applicants should provide a need-based budget and minimize major equipment.

RFA-03: Etiology, Surveillance and Management of Cotton Red Leaf, Red Stem and Wilt Complex

Applicants should treat the scope below as indicative. Innovative, evidence-based alternatives are encouraged if they clearly address the commissioned problem and deliver measurable outputs.

Problem focus: Cotton red leaf, red stem and wilt symptoms are increasingly reported in cotton-growing areas, but the underlying causes are not clearly separated from nutrient imbalance, vascular pathogens, insect stress, water stress, soil constraints, varietal susceptibility or possible viral/phytoplasma-like factors. Without diagnosis, farmers resort to indiscriminate and often ineffective interventions.

Overall objective: To diagnose the causal and contributing factors of the cotton red leaf/red stem/wilt complex and develop practical, integrated management recommendations for representative Punjab cotton environments.

Indicative Scope of Work:

- Conduct field surveillance and severity mapping across affected cotton districts.
- Differentiate pathological, nutritional, physiological, soil, water and insect-related contributors.
- Use laboratory and molecular diagnostics where needed to identify major pathogens or associated agents.
- Screen commercial varieties and advanced material for relative tolerance.
- Develop integrated management options covering variety, nutrition, irrigation, soil/root health and pest management.
- Validate recommendations through field trials and farmer participatory demonstrations.

Expected Deliverables:

- Surveillance database and distribution maps of red leaf/red stem/wilt complex.
- Diagnostic protocol to distinguish the complex from other disorders.
- Identification of major causal/contributing factors under Punjab conditions.
- List of relatively tolerant/susceptible varieties or lines.
- Integrated management recommendations and farmer advisory material.
- Policy brief on surveillance and management needs.

Suggested Performance Indicators:

- Number of representative districts/fields surveyed and diagnosed.
- Diagnostic workflow validated by field and laboratory evidence.
- Management package tested under field conditions.
- Reduction in incidence/severity or yield loss in demonstration plots.
- Extension material prepared and shared with relevant departments.

Preferred team/stakeholder linkage: Plant pathology, soil science, plant nutrition, entomology, physiology, cotton breeding, molecular diagnostics, agronomy and extension.

Indicative duration: Up to 24 months.

Budget framework: As per EFS ceiling; applicants should provide a need-based budget and minimize major equipment.

RFA-04: Climate-Resilient Cotton Variety Development through Functional Markers, Genomics and Multi-Location Screening

Applicants should treat the scope below as indicative. Innovative, evidence-based alternatives are encouraged if they clearly address the commissioned problem and deliver measurable outputs.

Problem focus: Cotton varieties are increasingly exposed to heat, drought, CLCuD, insect pressure and unstable environments. Conventional breeding alone is slow for combining multiple traits, while functional markers, genomic information and coordinated multi-location screening remain underused in routine cotton improvement.

Overall objective: To accelerate climate-resilient cotton improvement by validating useful markers/genomic tools, identifying resilient germplasm and advancing breeding material through multi-location evaluation.

Indicative Scope of Work:

- Characterize relevant cotton germplasm, varieties and advanced lines for priority adaptive traits.
- Validate functional markers linked with heat, drought, CLCuD tolerance, fiber quality or other priority traits.
- Integrate molecular screening with field phenotyping and multi-location testing.
- Develop or advance breeding populations/lines using marker-assisted or genomics-assisted selection.
- Generate a reusable database for cotton breeders and research institutions.
- Prepare candidate material or pre-breeding resources for further varietal development.

Expected Deliverables:

- Validated marker/phenotyping protocol for priority cotton traits.
- Characterized germplasm/breeding lines for resilience and fiber quality.
- Multi-location performance dataset and genotype-by-environment interpretation.
- Advanced lines, populations or pre-breeding material for future testing.
- Shared technical database and breeding recommendations.
- Capacity-building session/manual for cotton breeders and technical staff.

Suggested Performance Indicators:

- Germplasm/lines characterized across priority traits and environments.
- Markers validated and recommended for routine breeding use.
- Multi-location trials completed with documented stability/adaptation data.
- Pre-breeding or candidate material advanced for next-stage evaluation.
- Breeder-focused protocol/database delivered to EFS/UAF/relevant partners.

Preferred team/stakeholder linkage: Cotton breeding, molecular genetics/genomics, biotechnology, physiology, plant pathology, fiber quality testing, statistics/bioinformatics and AARI/NIAB/NIBGE/CCRI-type partners.

Indicative duration: Up to 24-36 months, depending on breeding material and justification.

Budget framework: As per EFS ceiling; applicants should provide a need-based budget and minimize major equipment.

RFA-05: District-Specific Cotton Revival Packages: Seed, Sowing Window, Pest, Water and Advisory Integration

Applicants should treat the scope below as indicative. Innovative, evidence-based alternatives are encouraged if they clearly address the commissioned problem and deliver measurable outputs.

Problem focus: Cotton constraints vary by district due to climate, soil, water quality, sowing windows, pest pressure, varieties and farmer practices. Uniform recommendations are often too general, limiting adoption and reducing the effectiveness of cotton revival efforts.

Overall objective: To develop and validate district-specific cotton revival packages integrating seed/variety choice, sowing window, irrigation, nutrition, pest management and advisory support.

Indicative Scope of Work:

- Analyze district-level production constraints, climate trends, soil/water factors and pest/disease patterns.
- Identify suitable varieties, sowing windows and input-management practices for representative districts.
- Integrate irrigation, nutrient and pest-management recommendations into simple district packages.
- Use available weather, pest and crop data to support timely advisories.
- Validate packages through demonstration plots and farmer/extension feedback.
- Develop district-wise extension material for rapid dissemination.

Expected Deliverables:

- District-specific cotton revival packages for selected Punjab cotton districts.
- Decision-support matrix for variety, sowing window, irrigation, nutrition and pest management.
- Demonstration results comparing recommended package with farmer practice.
- Farmer-friendly production calendars and extension material.
- Policy/extension brief for scaling through provincial departments and farmer networks.

Suggested Performance Indicators:

- Number of districts profiled and packages developed.
- Demonstration plots established and evaluated.
- Yield, input-use efficiency or profitability gains documented against farmer practice.
- Farmers and extension staff trained.
- District-wise advisory material disseminated through relevant platforms.

Preferred team/stakeholder linkage: Agronomy, cotton breeding, entomology, plant pathology, soil/water experts, extension, data/GIS, progressive farmers and district agriculture stakeholders.

Indicative duration: Up to 24 months.

Budget framework: As per EFS ceiling; applicants should provide a need-based budget and minimize major equipment.

RFA-06: Cotton Mechanization and Precision Tools Package for Smallholder Production Systems

Applicants should treat the scope below as indicative. Innovative, evidence-based alternatives are encouraged if they clearly address the commissioned problem and deliver measurable outputs.

Problem focus: Cotton farmers face rising labour costs, delayed operations, inefficient pesticide and fertilizer application, and limited access to machinery suited to small and medium farms. Many available technologies are not independently evaluated for local cotton systems, farm economics or service delivery.

Overall objective: To identify, adapt and validate affordable mechanization and precision tools for cotton production, with emphasis on smallholder usability, input efficiency and service-provider models.

Indicative Scope of Work:

- Assess mechanization bottlenecks in land preparation, sowing, spraying, inter-culture, harvesting and post-harvest handling.
- Evaluate or adapt low-cost tools such as planters, sprayers, nozzles, mechanical weeders, sensors, drones or precision application systems.
- Test machinery performance, economics, labour savings, input-use efficiency and farmer acceptability.
- Develop custom hiring or service-provider models for smallholder access.
- Prepare simple machinery standards, operation protocols and training modules.
- Demonstrate selected tools through field days and stakeholder partnerships.

Expected Deliverables:

- Validated cotton mechanization/precision tools package for smallholder systems.
- Performance and economic evaluation of selected machinery/tools.
- Spraying/nozzle/application protocol and operator training material.
- Custom-hiring/service model for machinery access.
- Policy brief on machinery standards, certification and scaling.

Suggested Performance Indicators:

- Mechanization constraints documented for representative cotton systems.
- Selected tools tested under field conditions.
- Labour, cost, input-use or timeliness improvements demonstrated.
- Farmers/operators/service providers trained.
- Mechanization protocol and scaling model submitted to EFS/relevant departments.

Preferred team/stakeholder linkage: Agricultural engineering, farm machinery, cotton agronomy, entomology/spraying technology, economics, private manufacturers/service providers and farmer groups.

Indicative duration: Up to 24 months.

Budget framework: As per EFS ceiling; applicants should provide a need-based budget and minimize major equipment.

RFA-07: Digital Agriculture and AI-Based Advisory Systems for Cotton-Wheat and Rice-Wheat Regions

Applicants should treat the scope below as indicative. Innovative, evidence-based alternatives are encouraged if they clearly address the commissioned problem and deliver measurable outputs.

Problem focus: Farmers and decision-makers lack timely, location-specific and integrated advisories on weather, irrigation, pests, diseases, sowing windows, crop health and market-relevant actions. Existing data are fragmented across institutions, limiting early warning, extension effectiveness and policy response.

Overall objective: To develop and pilot a practical digital decision-support and advisory system for priority cropping regions, linking field data, weather, satellite information, pest/disease surveillance and farmer-friendly recommendations.

Indicative Scope of Work:

- Map existing data sources, advisory channels and extension gaps in selected cotton-wheat and rice-wheat areas.
- Develop a data integration framework using weather, crop, soil, pest/disease, water and remote-sensing information.
- Build or adapt AI/analytics modules for early warning, crop health monitoring and advisory generation.
- Pilot mobile/SMS/web/dashboard-based advisories for farmers, extension workers and policymakers.
- Validate advisory accuracy, usability and response time with field stakeholders.
- Develop governance recommendations for data sharing, updating and institutional ownership.

Expected Deliverables:

- Prototype digital advisory platform/dashboard for selected districts/crops.
- Validated advisory modules for weather, pest/disease, irrigation or crop-management decisions.
- Farmer and extension user database/pilot engagement report.
- Data-sharing and governance framework for participating institutions.
- Training manuals and policy brief for scaling digital extension.

Suggested Performance Indicators:

- Prototype platform operational and tested with real users.
- Number of advisories generated, validated and disseminated.
- Improvement in timeliness/relevance of decisions documented through pilot users.
- Extension staff/farmers trained.
- Data governance and sustainability plan submitted.

Preferred team/stakeholder linkage: Digital agriculture, agronomy, plant protection, meteorology, remote sensing/GIS, AI/data science, extension, IT and provincial/district advisory stakeholders.

Indicative duration: Up to 24 months.

Budget framework: As per EFS ceiling; applicants should provide a need-based budget and minimize major equipment.

RFA-08: Edible Oil Crop Diversification in Cotton-Wheat Systems to Reduce Import Dependence

Applicants should treat the scope below as indicative. Innovative, evidence-based alternatives are encouraged if they clearly address the commissioned problem and deliver measurable outputs.

Problem focus: Pakistan remains heavily dependent on imported edible oil, while cotton-wheat systems offer opportunities for profitable integration of oilseed crops. Adoption is constrained by weak seed systems, uncertain crop calendars, low yields, mechanization gaps, limited processing linkages and poor farmer economics.

Overall objective: To develop and validate economically viable oilseed diversification models within cotton-wheat systems, with clear production, mechanization, seed and market-linkage pathways.

Indicative Scope of Work:

- Identify suitable oilseed crops and varieties for selected cotton-wheat districts and cropping windows.
- Develop diversification models such as cotton-mustard, canola-cotton, sesame or sunflower-based options where agro-ecologically suitable.
- Evaluate productivity, profitability, water use, soil effects and compatibility with existing farm operations.
- Address quality seed availability, agronomic protocols and mechanization needs for oilseed crops.
- Connect farmer demonstrations with processors, seed companies or edible-oil value-chain actors.
- Prepare scaling recommendations for extension and policy use.

Expected Deliverables:

- Validated oilseed diversification packages for selected cotton-wheat systems.
- District/cropping-window suitability matrix for priority oilseed crops.
- Seed, agronomy and mechanization guidelines.
- Demonstration results showing farm economics and resource-use benefits.
- Value-chain linkage model with processor/industry engagement.
- Policy brief on scaling oilseed diversification.

Suggested Performance Indicators:

- Diversification models tested in representative districts.
- Profitability/resource-use efficiency documented against existing system.
- Demonstration plots established and evaluated.
- Seed/value-chain partners engaged.
- Farmers/extension staff trained and scaling plan submitted.

Preferred team/stakeholder linkage: Oilseed breeding/agronomy, crop systems, farm machinery, economics, value-chain/marketing, seed companies, processors, extension and progressive farmers.

Indicative duration: Up to 24 months.

Budget framework: As per EFS ceiling; applicants should provide a need-based budget and minimize major equipment.

RFA-09: Water Productivity and Groundwater-Safe Irrigation in Cotton-Wheat and Rice-Wheat Systems

Applicants should treat the scope below as indicative. Innovative, evidence-based alternatives are encouraged if they clearly address the commissioned problem and deliver measurable outputs.

Problem focus: Cotton-wheat and rice-wheat systems face water scarcity, declining groundwater levels, deteriorating water quality, salinity risk and low irrigation efficiency. Farmers need practical guidance on irrigation scheduling, conjunctive use of canal and groundwater, and crop-specific water productivity.

Overall objective: To develop and validate water-productivity and groundwater-safe irrigation protocols for major cropping systems under representative Punjab conditions.

Indicative Scope of Work:

- Assess irrigation practices, water productivity, groundwater quality and salinity risk in selected districts.
- Develop crop- and location-specific irrigation scheduling and safe conjunctive-use guidelines.
- Evaluate water-saving practices and technologies such as precision irrigation, laser leveling, alternate wetting and drying where relevant, mulching or improved field layouts.
- Use GIS/remote sensing/weather data for water advisory and monitoring.
- Validate recommendations through field demonstrations and farmer feedback.
- Prepare policy guidance for groundwater-safe agriculture and water productivity improvement.

Expected Deliverables:

- Groundwater quality and irrigation suitability maps/atlas for selected areas.
- Validated irrigation scheduling and conjunctive-use protocols.
- Water productivity comparison under recommended vs prevailing practices.
- Digital or extension-ready irrigation advisory framework.
- Farmer manuals and policy recommendations for sustainable water use.

Suggested Performance Indicators:

- Representative water/soil/irrigation baseline completed.
- Water-saving protocols validated in field demonstrations.
- Improvement in water productivity or irrigation efficiency documented.
- Farmers/extension staff trained.
- Policy brief submitted to EFS/relevant water and agriculture departments.

Preferred team/stakeholder linkage: Water management, irrigation engineering, soil salinity, agronomy, GIS/remote sensing, economics, extension and farmer organizations.

Indicative duration: Up to 24 months.

Budget framework: As per EFS ceiling; applicants should provide a need-based budget and minimize major equipment.

RFA-10: Drought, Heat and Rust Resilient Wheat for Rainfed and Late-Sown Environments

Applicants should treat the scope below as indicative. Innovative, evidence-based alternatives are encouraged if they clearly address the commissioned problem and deliver measurable outputs.

Problem focus: Wheat productivity is increasingly threatened by drought in rainfed areas, terminal heat in late-sown irrigated systems and recurring rust pressure. Existing varieties and breeding pipelines need stronger integration of stress screening, durable resistance, rapid evaluation and farmer-field validation.

Overall objective: To identify, develop and advance wheat germplasm/lines with improved resilience to drought, terminal heat and rust for rainfed and late-sown environments.

Indicative Scope of Work:

- Identify and characterize sources of drought, heat and rust tolerance from local and introduced germplasm.
- Use conventional breeding supported by markers, pathology screening and stress phenotyping where available.
- Evaluate material under rainfed, late-sown and rust-prone conditions.
- Develop or advance breeding populations/elite lines with combined resilience and yield potential.
- Conduct multi-location or farmer-field validation of promising lines and production practices.
- Prepare recommendations for varietal development and stress-resilient wheat production.

Expected Deliverables:

- Screened germplasm and identified sources of heat, drought and rust tolerance.
- Advanced lines/populations with supporting phenotypic/pathology data.
- Validated markers or screening protocols where applicable.
- Multi-environment data for stress resilience and yield stability.
- Candidate material/recommendations for further national testing.
- Technical brief for breeders, extension and policy stakeholders.

Suggested Performance Indicators:

- Number of germplasm entries/lines screened under defined stress environments.
- Lines identified/advanced with combined tolerance or resistance.
- Rust screening and heat/drought evaluation completed.
- Field validation data generated across representative sites.
- Breeding recommendations submitted to EFS/relevant wheat programs.

Preferred team/stakeholder linkage: Wheat breeding/genetics, plant pathology, physiology, agronomy, molecular markers, rainfed agriculture, statistics and relevant AARI/NIBGE/NIAB/CDRI-type partners.

Indicative duration: Up to 24-36 months, depending on breeding material and justification.

Budget framework: As per EFS ceiling; applicants should provide a need-based budget and minimize major equipment.

RFA-11: Wheat Yield-Gap Reduction through Marker-Assisted Breeding, Rapid Generation Advancement and AI-Based Early Warning

Applicants should treat the scope below as indicative. Innovative, evidence-based alternatives are encouraged if they clearly address the commissioned problem and deliver measurable outputs.

Problem focus: Pakistan's wheat yield gap persists due to slow genetic gain, delayed varietal replacement, suboptimal agronomy, disease risks and limited access to timely advisories. A commissioned project should link breeding acceleration with field decision support rather than treat them as disconnected activities.

Overall objective: To reduce wheat yield gaps by integrating marker-assisted breeding/rapid generation advancement with AI-based early warning and advisory systems for improved varietal and crop-management decisions.

Indicative Scope of Work:

- Use markers/genomic tools and rapid generation advancement to accelerate breeding for priority traits.
- Identify or advance wheat lines with yield, stress tolerance and disease-resistance potential.
- Develop early warning/advisory modules for rust, heat, drought, sowing timing, fertilizer or irrigation decisions.
- Validate improved production packages through on-farm demonstrations.
- Integrate farmer/extension feedback into advisory design.
- Develop a practical implementation pathway for scaling through extension and research institutions.

Expected Deliverables:

- Marker-assisted/rapid-generation advancement workflow for priority wheat traits.
- Advanced lines or breeding material with supporting data.
- AI/analytics-based early warning or advisory prototype for selected wheat risks.
- Validated yield-gap reduction package under farmer/field conditions.
- Extension material and policy note for scaling.

Suggested Performance Indicators:

- Breeding cycles shortened or accelerated workflow demonstrated.
- Lines/material advanced or selected using markers/rapid generation tools.
- AI/advisory prototype validated with field data and users.
- Yield or management improvement documented in demonstrations.
- Extension and research partners trained.

Preferred team/stakeholder linkage: Wheat breeding, molecular genetics, speed breeding/rapid generation advancement, plant pathology, agronomy, AI/data science, meteorology/GIS and extension.

Indicative duration: Up to 24-36 months, depending on technical design and justification.

Budget framework: As per EFS ceiling; applicants should provide a need-based budget and minimize major equipment.

RFA-12: Integrated Approach for Enhanced Productivity and Sustainability in Dairying

Applicants should treat the scope below as indicative. Innovative, evidence-based alternatives are encouraged if they clearly address the commissioned problem and deliver measurable outputs.

Problem focus: Dairy productivity is constrained by poor nutrition, fodder shortages, weak genetic improvement, inefficient reproduction, disease burden and limited adoption of improved herd-management practices. Fragmented interventions do not sufficiently improve milk yield, reproductive efficiency, animal health or farm profitability.

Overall objective: To develop and validate an integrated dairy productivity model combining feed/fodder optimization, breed/reproduction improvement, disease prevention and farmer-level management under representative dairy systems.

Indicative Scope of Work:

- Assess baseline dairy productivity, nutrition, reproduction, disease burden and management practices in selected systems.
- Develop balanced, cost-effective feeding and fodder packages, including climate-resilient fodder options and locally available feed resources.
- Evaluate breeding/AI/ART interventions and reproductive management practices suitable for small and medium dairy farms.
- Develop disease prevention and control protocols for priority diseases such as FMD, mastitis, LSD or reproductive diseases, as relevant to project design.
- Test integrated dairy management packages through demonstration farms or farmer clusters.
- Assess adoption barriers, economics and scaling pathway for public/private livestock services.

Expected Deliverables:

- Integrated dairy productivity package covering feed, fodder, breed/reproduction and health management.
- Baseline and endline data on milk yield, reproduction, disease incidence and economics.
- Validated feeding/fodder protocols and reproductive-management recommendations.
- Disease prevention/early warning/vaccination or rapid-screening guidance where applicable.
- Demonstration farm/cluster model and farmer training materials.
- Policy/commercialization note for scaling through livestock department, private farms or service providers.

Suggested Performance Indicators:

- Improvement in milk yield, reproductive efficiency or farm profitability documented in intervention units.
- Reduction in selected disease incidence/risk factors where disease component is included.
- Number of farmer's/service providers trained.
- Demonstration sites or clusters established and evaluated.
- Adoption and scaling plan submitted with public/private stakeholder linkage.

Preferred team/stakeholder linkage: Animal nutrition, fodder/agronomy, animal breeding/reproduction, veterinary medicine, epidemiology/disease diagnostics, dairy economics, extension and private/progressive dairy farms.

Indicative duration: Up to 24-36 months, depending on technical design and justification.

Budget framework: As per EFS ceiling; applicants should provide a need-based budget and use existing institutional/field facilities wherever possible.