

# **“State Higher Research Centres of Excellence in Science & Technology Applications (SHRESTA)”**

## **Guidelines**

### **1. Introduction**

State Higher Research Centres of Excellence in Science & Technology Applications (SHRESTA) is envisaged for nurturing a few Centres of Excellence (CoE) from the State that produce world-class research in the areas of (i) Floods and Droughts (ii) Viral Research (Biotechnology) (iii) Nanotechnology (iv) Climate Change and (v) Robotics & Artificial Intelligence. SHRESTA aims to nurture the mature and nascent CoEs initially for two years and the potential Centres among them will be provided further support for next three years, attaining to a world class level. Research Centres/ R&D Institutions under Govt. of Kerala, Science/ Engineering Departments of State Universities and Government Colleges in Kerala, having reputed standing and ranking and proven track record in research can apply under this scheme. The proposed CoEs need to collaborate with National/ International Research Centres/ Universities/ Institutions. The selected Centres will be supported with financial grant to augment and strengthen the research capacity of the Centre including infrastructure at par with world class level in the stipulated areas with a multi-disciplinary and inter-institutional perspective. The overall aim of this programme is to develop Centres of Excellence in the State and facilitate pursuit of high-quality research and development of technologies through substantial investment in the Research Centres/Universities/Institutions and having proven track record and commitment to research. SHRESTA envision capturing new knowledge and practices and developing world-class expertise in the specialised areas and make the most of its resources to act as a knowledge centre and provide a focal point for advanced knowledge management, with the overall capability for technology transfer and industrial collaboration for the socio-economic development of the Kerala State.

## 2. Strategy of SHRESTA

KSCSTE aims to foster the Centres of Excellence in the Kerala State and the proposal under this scheme shall lead to the creation of a nationally renowned Centre of Excellence (CoE) in a vibrant research area. The proposed CoEs need to collaborate with National/ International Research Centres/ Universities/ Institutions and the proposal shall include the details with the consent from such collaborating institutions. Existing mature CoEs can propose with a plan to upgrade significantly onto the global scenario while nascent CoEs in the identified research areas can also propose. The Centre of Excellence (CoE) will be supported in phased manner with a grant of **Rs. 200 lakhs** (maximum), over a period of 5 years. The proposed plan submitted under the Scheme shall be for 5 years, in two stages – Phase I for the first 2 years and Phase II for the next 3 years. The maximum grant in the Phase I will be Rs. 60 lakhs and in the Phase II, the maximum grant amount will be Rs.140 lakhs, as explained in the ongoing. The Head of the Institution shall be the in-charge of the CoE and responsible for the overall management of the Centre. The Centre/Institution shall also submit the perspective plan for the next 5 years with credible sources for sustenance of the CoE after the grant period is over. There should be separate budget proposals for Phase I and Phase II with clearly identified deliverables for the two phases.

**Phase I :** Based on the peer review of the proposal by the national level subject experts and evaluation by the Programme Advisory Committee (PAC), the Centre will be initially selected for Phase I support for a period of 2 years. Based on the quality and number of proposals received, the available funds will not be stretched too thin for all the proposals but instead 3 best promising proposals as recommended by the PAC will be supported in a financial year. The deliverables of Phase I have to be achievable in a short time frame and defined so as to claim their rights for Phase II consideration. It is suggested that Phase I cannot include any equipment that is very expensive and has a long gestation period for procurement and installation. During the Phase I, each CoE shall achieve the targeted and defined deliverables. On completion of Phase I, the progress of all CoEs including the deliverable will be critically reviewed by the Programme Advisory Committee (PAC), which

may include field visits also. The Centres which could not achieve the targeted and desired progress and deliverables in Phase I and which have no scope for further expansion will not be considered for further support.

**Phase II :** Based on the performance and the deliverables achieved in Phase I, and as recommended by the PAC, the potential Centres of Excellence will be provided continued support for Phase II for a period of further 3 more years. Based on the performance of the CoEs receiving support in the first Phase, a subset of CoEs which show clear promise of becoming world-class Centre will only be supported for the Phase II.

The application for the scheme shall contain a research proposal and necessary infrastructure strengthening including equipment/lab facilities. The space/building for the setting up of laboratory and other facilities shall be identified by the host Institution. The space identified must have scope for further future expansion and also accessibility. In case any separate building construction or improvement of available physical space is required, that shall be the responsibility of the host institute. KSCSTE shall support the Centre for the procurement of necessary equipment and lab facilities along with allied research. Once the Centre is established, the upgradation and updation of the Centre at par with the state-of-the-art technology, shall be the responsibility of the host Institute. The host Institution shall have a perspective plan for the sustained development and progressive growth of the Centre of Excellence to take up further advanced research in the field. Host Institution can also explore the possibility to seek funding from other agencies to upgrade the Centre. The Centre of Excellence shall be managed in such a way that it is accessible to the Scientists, Researchers, Faculty members and Students in the field to promote advanced research and inter Institutional and multi- dimensional and inter-disciplinary research.

### **3. Proposal Plan**

- ❖ Research Centres/R&D Institutions under Govt. of Kerala, Science/Engineering Departments of State Universities and Government Colleges in Kerala, having reputed standing and ranking and proven track record in research are eligible to apply under this scheme. Preference will be given to the R&D Centres of KSCSTE.

- ❖ The scheme encourages to collaborate with National/ International Research Centres/ Universities/ Institutions and the proposal shall include the details with the consent from such collaborating institutions.
- ❖ The Principal Investigator (PI) shall be the Head of the Institution/Centre/Dean in the case of University Departments, and he/she shall be a full time Faculty/Scientist having Doctoral Degree in Science/ Engineering.
- ❖ The PI shall have sufficient experience in administering and managing the Research Centres/Institutions, shall have carried out National/ International Research Projects and have at least 15 years of experience in carrying out Research activities/PG teaching.
- ❖ In case, the PI leaves the Institution due to unforeseen reasons, on transfer or superannuation or other reasons, the responsibility will be automatically transferred to the succeeding Head of the Institution until successful completion of the programme.
- ❖ There can be more than one Co-Investigator depending up on the multidisciplinary nature of the research, and the first Co-Investigator shall be from the same Institute or Department. The Co-Investigators (Co-Is) shall be full time Faculty/Scientist of the Centre/ University/ Institution with more than 3 years of service to retire. The first Co-Investigator shall have the same responsibility and accountability as that of the Principal Investigator. In case the first Co-I leaves the organisation before the successful completion of the programme, the Institute shall take up the responsibility to assign another suitable faculty as the first Co-I in consultation with KSCSTE, to continue with the programme until its successful completion.
- ❖ All the Co-Is shall have at least 3 years of experience in teaching/research activities.
- ❖ In the case of Centres carrying out multidisciplinary research, the collaboration of State/National/International level Centres is preferred. In such case, there can be more Co-Is for the project in the area of specialisation depending upon the interdisciplinary nature of the research area.

- ❖ The project team shall comprise of PI, Co-Is and Researcher Scholars. The Researchers may be registered full-time students for PhD or Post-Doctoral.

#### **4. Format for Submission of Proposals**

Proposals for establishing the SHRESTA Centre will be invited through notification in the website of KSCSTE, once in a year, generally during July-August. The Proposals can be submitted through online only on notification and during the active time. The proposal description will be as explained below:

- **Introduction** - A few paragraphs succinctly explaining the area of focus of the CoE, the significance of the problem(s) that is (are) being addressed by the CoE, and the potential impact that can result from solving this (these) problem(s).
- **State of Scientific Knowledge** - This section should address how the research community has hitherto attempted to solve the problem(s), what are the gaps leading to key scientific questions/technological roadblocks that, if resolved, could help this faculty group solve the problem(s). Indicate the leading groups in the world currently working on the problem(s) and the relation of the proposed work to the ongoing work in these groups. It is important that the problem be currently researched globally, or be an old challenging problem pursued by some group or the other at some time, or a problem highly relevant to Kerala/India that has been ignored elsewhere. Prior standing of the PIs in terms of high-impact publications in the area, and technologies developed by them (where relevant), will go a long way in establishing credibility. Publication record of the PIs in high- impact journals and the visibility of their work in terms of citations are important metrics.
- **Identification of key elements and Objectives of the Proposal** – As detailed in the previous section, this section should contain the list (reduced) of scientific questions/technological advancements that are being addressed by this proposal leading to a crisp summary of the objectives of the proposal.

- **Meeting the SDG** – the proposal shall fit into the Sustainable Development Goal (SDG) Framework with details of SDG Goals & Indicators.
- **Work plan** - For each objective, describe a detailed work-plan, which will include: how each work-plan element will subserve the objective of the proposal, preliminary work that highlights the technical feasibility of the work-plan element, metrics that would allow to evaluate if the work-element was successful. The work plan should be in two phases (Years 1-2, and 3-5) as detailed in the strategy of the scheme.
- **Summary of Novelty and Intellectual Merit of the Proposal** - Please clearly indicate the challenges/research problems that will be attempted and the innovations envisaged in the area of the CoE. Provide information on other groups working in this field (both in India and Abroad). Most importantly, highlight how the proposed CoE will either compete or collaborate with these groups.
- **Budget Proposal** - Budget Proposal shall be prepared in the prescribed format and submitted along with the Proposal. Separate budget proposals shall be submitted for Phase I and Phase II. Even though, the financial grant under this scheme is sanctioned in Phased matter, the PI shall submit the budget proposals for Phase I and Phase II along with the proposal. The proposal should not include any equipment that is very expensive and has a long gestation period for procurement and installation, in Phase I. Please note that equipments budgeted in the proposal has to be procured as per the purchase procedure of the Centre/Govt. of Kerala. Instrument specifications have to be provided with the budgetary estimate.
- **Deliverables (in Two Phases – I for years 1-2 and Phase - II for years 3-5)**
  1. **Publications and visible output** - A brief description of high impact papers, patents, new instrumentation, prototypes, technologies, or startups, that are likely to result if the proposed work is successful, as well as the expected journals and top-notch conferences that can be targeted for such publications. Evidence that the PIs have had prior experience in publishing in these journals will matter. Efforts that will be taken to disseminate the findings of the results to improve visibility through participation

in/conduct of key conferences should be highlighted. Evidence of prior participation in/organization of these conferences will matter.

**2. Human Resources Development** - A statement on Human Resources Development in terms of number of doctoral and post-doctoral students that will participate, Faculty/Scientist from other Institutes/Centres that will participate (outreach and capability building), Industrial collaborators (if any) that will participate.

**3. Internationalization –**

**a. Collaborations** - Describe international collaboration efforts that will be pursued. If possible, identify top Research Institutions/Academics internationally in the field of the proposal and efforts that could be undertaken to initiate possible collaborations.

**b. International Conferences** - Furnish the plans for international conference(s) that can be organized in the field of the proposal. Include as much information as possible in terms of themes, sub-themes, experts in these areas and so on. Also describe how participation of Faculty/Scientist and scholars from the CoE will be strategically planned in the leading international conference(s) in the chosen area so as to establish strong global visibility for the CoE.

**4. Industrial Collaboration** - Describe industrial collaboration aspects of the proposal, if any. If there are such possibilities, identify the industries that can participate in commercialization and whether additional funding can be attracted from them and how much. Additionally, please describe if the expertise developed by the PI through this proposed work could lead to international consulting opportunities.

**5. Societal Impact** - Explain the social impact which is likely to accrue if this proposal is successful. Please outline potential constituency and impact in the short term (< 2yrs), medium term (<5yrs) and long term.

**6. Perception plan** - Describe a credible plan that would make the CoE among the best in the Country in a particular area, and also be perceived as a strong player in the field in 5 years. The feasibility of the plan presented in this part is crucial for the success of

proposal. Strong presence at the leading conferences in the field, keynote talks, review articles, editorships, etc. are indicators of a strong positive perception.

7. **Sustenance Statement** - Explain a sustenance plan for the CoE beyond the grant period. This should address the maintenance and operation of equipments procured under the scheme, and additional support to keep advancing the research envelope. If the proposed CoE already has or will be able to attract other funds in addition, this should be highlighted as it increases the resilience of the CoE.

- **How to apply** - Proposals shall be submitted online only during the active time of notification. The Principal Investigator shall submit the Endorsement from the proposed Institution and the collaborating Institutions, Consent letter and necessary Certificates from the Investigators in the prescribed format along with Resumes highlighting the research achievements. General Format of Documents will be available in the website of KSCSTE. Proposals submitted in any other mode will not be considered.

## 5. Social Relevance and Expected Output

Proposals from Research Centres/R&D Institutions/ University Departments/Govt. Colleges having excellent track record in conducting research and technology development activities in the identified areas of specialisation will be supported under the scheme by upgrading such Institutions to a Centre of Excellence in the field. The Research component in the proposal shall have social relevance pertaining to the socio-economic development of the Kerala State and also to solve the challenging problems. The proposals shall be for research projects in collaboration with National/International Research Centres/ Universities/ Institutions. The scheme envisions improving expertise in a certain specialised area and making the most of its resources to provide a focal point for knowledge management, with the overall goal being the ability to capture new knowledge and practices for the socio-economic development at par with international level. Tangible research output with a new product/technology/process having potential for commercialisation is expected. The PI has to ensure the expected industrial collaboration and provide an undertaking in this aspect. The additional tangible output is the creation of facilities with various equipments and necessary infrastructure which



can facilitate further augmented research in the Institution/ Centre in the area of specialisation. The SHRESTA Centres can be a common research centre for researchers in the State and make use of the facilities for their research also. The other output indicators are publications/patents/PhDs.

## 6. Commercialisation Efforts

As already explained, the tangible research outputs with a new product/technology/process having potential for commercialisation are expected from each SHRESTA Centre. The efforts which will be made for commercialising the research output shall be clearly mentioned in the proposal. Collaboration with such potential industry and their willingness will be an added advantage of the proposal.

## 7. Financial Support from KSCSTE

The Centre of Excellence will be provided with financial grant limiting to Rs. 200 lakh which will be spread on a span of 5 years, in 2 phases. The financial grant will be sanctioned in phased manner and released on yearly basis based on the thorough review. Maximum financial grant for Phase I is limited to 60 lakh and 140 lakh for Phase II. The year wise breakup of maximum financial grant from KSCSTE to the CoE is as follows;

Amount in lakh							
Phase I			Phase 2				
Year 1	Year 2	Total	Year 3	Year 4	Year 5	Total	Grand Total
20	40	60	60	50	30	140	200

Only the Centres which are selected for Phase II support will get the financial grant allotted for Phase II.

Maximum three Centres (depending on budget availability) will be selected under the scheme in each year for Phase I. Normally only one proposal will be accepted from one Institution. The grant is exclusively for the stipulated research and infrastructure requirements and does not include any civil construction or moveable or immovable properties. The space/building for the setting up of laboratory and other facilities shall be identified by the proposing institute. In case any separate building construction or improvement of available physical space is required, that shall be the responsibility of the proposing institute. No grant sanctioned under the project in full or part is liable to be diverted for such purposes.

## **8. Strategy of Sanctioning the SHRESTA CoE**

### **➤ Scrutiny of Application**

On receiving the project proposal, Acknowledgement with Reference Number and other Instructions, if any, will be issued. The proposals are scrutinized thereafter. After scrutiny, the proposals will be further processed for peer review.

### **➤ Peer Review**

The proposal as per the prevailing norms of KSCSTE in prescribed format will be forwarded to 5 National level Reviewers (which may include International Level Reviewers also) who are experts in the field for Review. Proposals which are recommended by at least 3 Reviewers may be placed in the Programme Advisory Committee (PAC) of SHRESTA for further thorough evaluation and final decision, if required.

### **➤ Presentation before the Programme Advisory Committee**

The PI/Co-I may be invited to present the proposal before the PAC. The PAC assesses the proposals and based on the merit, recommends for providing support to the Centre of Excellence (CoE) in Phase I, for a period of 2 years. The Committee also recommends the quantum of financial grant to be provided to the CoE. The decision of KSCSTE based on the recommendations of PAC on such proposal shall be final. The panel of Reviewers and the PAC shall be decided and constituted by KSCSTE.

➤ **Issuing Sanction Order**

Based on the recommendations of the PAC and with the approval of competent authority, Offer letter with the recommendations of PAC will be issued to the Principal Investigator/ Co-Investigator. The PI accepting the offer shall execute the Terms and Conditions (T&C).

- After receiving the T&C from the Institute, and if the documents furnished by PI are in order, Sanction Order will be issued. The sanction order includes breakup of funds allocated under different heads like Equipment, Human Resources, Research, Infrastructure strengthening, Travel, Consumables, Other Cost, Contingencies, etc. The total cost of the project will be finalised based on the latest quotation(s) of the equipments approved under the project and other relevant documents related to Human Resources, contingencies, etc. submitted by the Principal Investigator.
- Copies of Sanction Order will be sent to the Principal Investigator (PI)/ Head of the Institution. Any correspondence with KSCSTE regarding the project should invariably quote the reference number and date in the Sanction Order and it should be addressed to the Director, KSCSTE.
- After issuing Sanction Order from KSCSTE, the Council will take steps to effect the payment for the first year electronically.
- The financial grant for the Centre is released on the basis of yearly requirements taking note of technical progress and expenditure incurred. The first sanction order indicates the budgetary allocation for the entire duration of project (2 years) under various heads like Equipment, Human Resources, Research, Infrastructure strengthening, Travel, Consumable, Other costs, Contingencies, etc. The first installment of grant (1<sup>st</sup> year grant) is released along with the first sanction order.
- Diversion of funds from Equipment, Human Resources, etc., is normally not allowed. However, any reallocation/ re-appropriation of grants under different heads require prior approval of KSCSTE. The Equipments sanctioned should be procured at the earliest to avoid any cost escalation. The PI/ Host Institution should complete all formalities in advance for placing the order. There should not

be a break/ time gap in between the project period. The project has to be done continuously and it shall end on expiry of approved duration.

- The Institution shall not entrust the implementation of the work for which the grant is being sanctioned to another institution nor shall it divert the grant to other institution as assistance. In case the Institution is not able to implement the project, it should refund to KSCSTE the entire grant or the balance grant at the earliest.

- **Date of Start of the Project**

The project becomes operative with effect from the date of sanction order or receipt of fund by the Host Institution. This date should be intimated by the Institution authorities/ Principal Investigator to KSCSTE. The date of start of the programme should in no case be later than one month after the receipt of the fund by the Institution.

- **Submission of Progress Reports (QPR, AR)**

PI shall furnish Progress Reports on the research work and other activities carried out on a quarterly basis. Quarterly Progress Reports (QPRs) should be submitted with effect from Date of Start of project. In addition, PI shall submit Annual Technical Progress Report on project-year-basis within 3 months of completion of project year from the date of start of project.

- **Progress Monitoring/Review procedure**

The PI has to present the technical and financial progress of the work carried out before the Programme Advisory Committee (PAC) of the Programme, on yearly basis. The Committee will meet normally once in every year or as and when required. Also, the financial grant for subsequent years will be released based on the review of progress and recommendation of PAC. The PAC can also conduct a field visit to monitor the physical progress. The Committee reserves the right to terminate the Project at any stage if it is convinced that the grant has not been utilised properly or satisfactory progress is not being made.

- **Periodic submission of SE & UC**

The Host Institution shall forward the audited financial statements - Utilization Certificate (UC) and Statement of Expenditure (SE) countersigned by the Head of the Institution/Centre to the effect that the grant has been utilized for the research work for which it was granted. Audited Utilization Certificate and Statement of

Expenditure (audited by Accounts Officer) of the previous year in the prescribed format should be furnished within three months of completion of project year calculated from the date of start of the project and not based on financial year.

➤ **Project Completion Report & Final Technical Report**

On completion of the period of Phase I, the Principal Investigator shall submit 2 copies of bound volume of Project Completion Report (PCR) and 3 copies of Final Technical Report (FTR) in the prescribed format (soft binding without using plastic material and also with soft copies). Along with PCR and FTR, the Asset Transfer Certificate duly signed by the Head of the Host Institution shall also be submitted in the prescribed format.