CENTRAL MUGA AND ERI RESEARCH AND TRAINING INSTITUTE, LAHDOIGARH (ASSAM)

1. Organizational Set up

Unit	No.	Place
RSRS	2	1) RSRS Boko (Assam) 2) RSRS Imphal (Manipur)
REC	4	1) REC Lakhimpur (Assam), 2) REC Coochbehar (WB), 3) REC Fatehpur (UP) 4) REC Sille (AP)

2. R&D Projects, TOT, ECP, CBT etc:

Item	Target	Remarks
1. CSB coded Research projects		
1.1. With PI from the Institute		
1.1.1. On-going projects during the year 2023-2024	04	Annex 5.I.1
1.1.2. Projects to be concluded during the year 2023-2024	06	Annex 5.I.2
1.1.3. New Projects to be initiated during the year 2023-2024	08	Annex 5.I.3
1.2. With CI from the Institute		
1.2.1. On-going projects during the year 2023-2024	01	Annex 5.I.4
1.2.2. Projects to be concluded during the year 2023-2024	--	Annex 5.I.5
1.2.3. New Projects to be initiated during the year 2023-2024	--	Annex 5.I.6
2. Transfer of Technologies (ToTs)		
2.1 On Station Trials (OST)		Annex 5.II.1
2.1.1. No. of technologies to be validated	10	
2.1.2. No. of trials/locations to be covered	55	
2.2 On Farm Trials (OFT)		Annex 5.II.2
2.2.1. No. of technologies to be demonstrated	11	
2.2.2. No. of locations to be covered	33	
2.2.3. No. of stakeholders to be covered	670	
3. Capacity Building & Training (CBT)		Annex 5.III
3.1. No. of programmes to be conducted	93	
3.2. No. of stakeholders to be covered	1940	
4. Extension Communication Programs (No.)		Annex 5.IV
4.1. Number of programmes to be conducted	73	

4.2. No of stakeholders to be covered	3660	
5.Soil analysis services provided		Annex 5.V
5.1. No. of states to be covered	03	
5.2. No. of samples to be analyzed	40	
6. Information, Education & Communication		Annex 5.VI
6.1. Periodicals	03	
6.2. Publications	65	
6.3. Extension literature	10	
6.4. Films / Videos	15	
6.5.Social media	100	
7. Patents to be filed/ granted, technologies to be commercialized, Software, mobile/android app to be developed etc.	04	Annex 5.VII
8. Procurement of equipments & other accessories	417.02	Annex 5.VIII
9. Other activities*(pl specify)*	12.50	Annex 5. IX
10. Revenue to be generated (Rs. in Lakhs)	34.0	Annex 5. X

1. CSB coded Research projects

1.1. With PI from the Institute

Annex-5.I.1

1.1.1. Ongoing projects during the year 2023-2024 (Rs. Lakhs)

#	Code	Title	Start	End	Milestones to be crossed	Progress to be achieved	Budget allocation
At main institute							
1	AIP 05013 SI	Impact of elevated CO_2 and temperature on muga silkworm and its primary host plant	Mar 2020	Feb 2023 (Extended upto Feb. 2025)	Analysis for biochemical constituents, protein, lipid, carbohydrate, etc. for muga silkworm. Cocoon quality will be analyzed. Grainage activity: Assessment of fecundity, hatching % and other related observation. Imposing treatments on host plants to continue. Recording plant growth attributes analysis for biochemical constituents, nutritional quality of leaf etc. at regular intervals. Rearing of 2nd and 3rd seed crops of muga silkworm in OTC's with varied CO_2& temperature regimes. Recording Silkworm growth, morphological attributes	Change in biochemical properties of the muga silkworm, cocoon and silk characteristics, seed production affected under treatment. Nutrition parameters of host plants and their effect on silkworm's growth will be quantified for 2nd and 3rd seed crops.	5.90
2	ARP 05023 CN	Muga and Eri silkworm disease monitoring and management in northeastern states of India	Mar 2023	Feb 2028	Procurement of Portable microscope with screen display (6 nos.). State-wise committee formation with team leader. Visit to seed farms and monitoring diseases and suggestion of remedial measures. Preparation of reports and data analysis.	Portable microscope that can be carried to the field for specific disease identification. State-wise committee for disease monitoring. Reduced disease incidence due to stringent monitoring in muga and eri ecosystem.	15.0
3	AIT 05024	Advanced level Institutional Biotech	Mar 2023	Feb 2026	Survey of different regions of Northeast India and collections of genetic material.	Collection of different ecoraces of eri silkworms.	0*

#	Code	Title	Start	End	Milestones to be crossed	Progress to be achieved	Budget allocation
	EF	Hubs at Central Muga Eri Research and Training Institute, Jorhat, Assam (Phase-II) (DBT funded)			Rearing of collected stock for a few generations to achieve homogeneity in characteristics. Phenotyping of selected ecoraces and strains.	Maintenance of ecoraces at the institute Phenotyping of ecoraces and keeping them ready for genotyping.	
At nested units							
4	APS 05021 EF	Studies on population diversity and role of host plant volatile cues for enhancing egg laying in temperate tasar (Vanya) silk moths *Antheraea proylei.* (DBT funded)	Jan 2022	Dec 2024	Rearing of Oak tasar silk moths, feeding bioassay and evaluation of best suitable host for the moth on egg laying productivity The synthetic blends standardized will be evaluated for enhancing egg laying in Oak tasar silk moths in NER	Maintain the culture of oak tasar silk moth for continuous supply to other collaborating Institutes. Feeding bioassays to find out the most suitable host plant which can enhance the egg laying. Evaluation of the different synthetic blends for enhancing egg laying in Oak tasar silk moths in NER	0*

Annex-5.I.2

1.1.2. Projects to be concluded during the year 2023 -2024 **(Rs. Lakhs)**

#	Code	Title	Start	End	Progress output	Utility of out-put/ Impact on silk industry	Budget allocation
At main institute							
1	AIB 05012 SI	Inter and intra-specific hybridization for improvement of eri silkworm, *Samiaricini* Donovan	Mar 2020	Feb 2024	Collected wild eri silkworm and utilized as one of the potential parents in the breeding programme. Inbreed rearing of homozygous population of parental breeds/races was achieved for utilization in actual breeding programme. Selected pureline parental stocks and utilized in actual breeding programme.	Recommendation of suitable evolved hybrid/breed for commercial exploitation will give a boost to Eri raw silk production in the country and will help in socio-economic upliftment of marginal farmers.	4.75

#	Code	Title	Start	End	Progress output	Utility of out-put/ Impact on silk industry	Budget allocation
					Crossing of pureline selected parents for selection of improved Eri silkworm hybrid/breed was achieved. Estimation of general and specific combining ability helps to identify suitable cross combinations for future breeding programmes. Selected hybrid lots with desired traits for evolution of improved Eri silkworm hybrid/breed. Single pair mating of selected hybrids and recurrent selection leads to attaining a certain level of homozygosity in the desired traits. Field trial of selected hybrids for ascertaining the potential of evolved hybrids.		
2	ARP 05015 SI	Development of chemical based control measures for management of pebrine disease in Muga silkworm, *Antheraea assamensis* Helfer	Jan 2021	Dec 2023	Insect bioassays studies with chemical disinfectants Efficacy analysis during on-station trails (OST), at research extension stations of CMER&TI Egg washing studies with different chemicals and optimization of protocol to avoid transovum infection. OST trails at research extension stations of CMER&TI and MSSO units	The technology will be evaluated in both on-station trials (OST) and on-farm trials (OFT) at CSB extension units and DOS farms. Later the developed technology will be demonstrated and disseminated at various Seri Resource Centers (SRCs), Institute village linking programmes (IVLPs)of CMER&TI, Lahdoigarh and at farmer's fields for increased production and productivity of Muga culture. The developed package and practices will be utilized to monitor and protect the spread of pebrine infection in Muga silkworm rearing and basic seed production centers of Muga silkworm	5.50

#	Code	Title	Start	End	Progress output	Utility of out-put/ Impact on silk industry	Budget allocation
						Seed Organization(MSSO) for the safe supply of disease-free layings (DFLs) to farmers/stakeholders	
3	APR 05018 MI	Effect of various host plants separately and in combination on Rearing and grainage performance of Muga silkworm, *Antheraea assamensis*	Mar 2021	Feb 2024	Muga Silkworm Rearing will conduct in all the six rearing crops. Muga Silkworm Grainage will conduct after all the six rearing crops.	Crop wise rearing, grainage and meteorological data. Identification of suitable host plant either solo or combination for successful rearing in different crop season.	2.70
4	APS 05020 MI	Commercial egg production technology for ericulture	Feb 2022	Jan 2024	Suitable egg laying device for commercial loose egg production. Commercial egg production enterprise package and separate commercial egg production technology descriptor. Scaling up of production of DFLs in large scale.	A new commercial loose egg production technology will be helpful to graineur and farmers to produce large number of DFLs in a small area with less usage of manpower. Synchronization in hatching leads to uniformity in rearing performance and less labour throughout the rearing and also during spinning stage. The new technology may be applied in developing egg production enterprise in Northeast and other eri growing regions of India.	3.65
5	MOE 05022MI - Evaluation and popularization of improved technologies developed in the field of Muga, Eri & Oak sector for North Eastern India (On-farm/on-station trials of CMERTI-Lahdoigarh- Collaboration with all nested units of CMER&TI and MESSO)						
		CI: On station multi-locational trials of muga and eri silkworm breeds/cross breeds/eco-race	Feb 2022	Jan 2024	Validation of technologies developed by the Institute under various projects	The technologies recommended will have positive impact on muga, eri and oak tasar production and productivity. Technological support will make these sectors more sustainable and economically viable avenues.	3.10

#	Code	Title	Start	End	Progress output	Utility of out-put/ Impact on silk industry	Budget allocation
		i. Multi-location trials of muga breeds CMR-1CMR-2 ii. Multi-location trials of Eribreeds/cross breeds iii. Popularization of Eri C2 breed and Borduar eco-race in Manipur					
		C2: On station trials of Muga silkworm Seed Preservation Technology i. Development of seed preservation technology for Muga silkworm					0.90
		C3: On station trials of Muga silkworm egg treatment(heat)foruniformhatchingand higher survivability of young larvae i. Validation of Muga silkworm egg treatmentfor uniform hatching and higher					0.28

#	Code	Title	Start	End	Progress output	Utility of out-put/ Impact on silk industry	Budget allocation
		survivability of young larvae					
		C4: Summer crop management in Muga (in coordination with MSSO,Guwahati) **i.** Rearing management of Muga silkworm in cooler region during summer **ii.** Trial of formulated volatiles application for enhancing egg laying capacity of Muga silk moth during commercial crop. **iii.** Trial of formulated volatiles application for enhancing egg laying capacity of Eri silk moth during commercial crop.					5.70
		C5: On station trials of Muga Post					1.80

#	Code	Title	Start	End	Progress output	Utility of out-put/ Impact on silk industry	Budget allocation
		Cocoon Technologies **i.** On station trials of Muga Super Cook formulation. **ii.** On station trials of Honey comb mountages for Muga					
At nested units							
6	AIB 05009 SI	Isolation of thermo-tolerant line(s) of Oak tasar silkworm *Antheraeaproylei* J.	Oct 2019	Sept 2022 (Extended upto Sept, 2023)	Seed cocoons of thermal stress induced and control lots of *A. proylei*, RTRS-1 and C_{27} are under preservation for continuing the generation. Protein profiling studies of heat induced cocoons of *A. proylei*, RTRS-1 and C_{27} showed six major proteins bands which are having high molecular weight to be expressed differentially (increased or decrease) after heat was induced at different temperature. These proteins were further identified by amino acid sequencing as HSP 19.9, 21, 60 and 90 which increase or decrease depending on temperature regimes. DNA isolation from *A. proylei*, RTRS 1 and C_{27} for development of SCAR marker under progress in Department of Biotechnology	The Isolated thermo-tolerantline can be multiplied further at RECs and utilized at farmers' level during unfavourable environmental conditions	2.00

Annex-5.I.3

1.1.3. New projects to be initiated during the year 2023 -2024 (Rs. Lakhs)

#	Code	Title	Start	End	Objectives	Expected output	Budget allocation
At main institute							
1	(Phase-II) (Approved by 66th RC)	Genetic enhancement of Castor (*Ricinus communis* L.) germplasm as a source material for development of productive perennial varieties.	Apr 2023	Mar 2027	Genetic enhancement of castor germplasm. Development of pre-bred intermediate castor with perennial characteristics.	Enrichment of gene pool with varied germplasm collections will be utilized in future castor improvement programmes. Selection of pre-bred intermediate castor hybrid with perennial characters during phase-I of the project and the recurrent selection in Phase-II will lead to development of a productive perennial cultivar with wider adaptability, which in turn will enhance the availability of leaf in the field for sustainable Eri culture.	4.00
2	CSB/CMER /RCN-154 (Approved by 61st RC)	Characterization and evaluation of Soalu (*Litsaea monopetala*) accessions for muga silkworm (*Antheraea assamensis*) rearing	July 2023	June 2026	To evaluate and characterize the available Soalu accessions towards varietal development	It is expected to identify most suitable Soalu accession for commercial cultivation to enhance muga production and productivity. This study will also support to identify base material for future breeding program.	16.5
3	Approved by 64th RC	Development of clonal propagation methods in Borpat (*Ailanthus grandis* L.) for its mass multiplication	July 2023	June 2026	To evolve simple, rapid and inexpensive clonal propagation techniques for mass multiplication of Borpat. Optimization of most suitable technique for mass multiplication of Borpat.	It is expected that a clonal propagation technique for Borpat will be developed for mass multiplication of true to type plants of this important Eri host plant. This will support in augmentation of perennial host plant availability for eri silkworm rearing.	15.50
4	Approved by 59th RC	*In-situ* conservation of muga silkworm	Jul 2023	Jun 2026	Enrichment of Muga silkworm population at natural habitat (in-situ).	Muga silkworms will be conserved at natural habitat. The germplasm	14.5

#	Code	Title	Start	End	Objectives	Expected output	Budget allocation
		in natural habitat (Phase II)			Assessment Muga silkworm germplasm suitable for breeding programme	resource will be readily available for utilization in development of new breeds.	
5	CSB/CMER /RCN-179 Approved by 40th RAC	Evaluation of role of polyamines; spermidine and spermine in enhancement of fecundity and egg production of muga (*Antheraea assamensis*) and eri (*Samia ricini*) silkworms. (DBT Funded in Collaboration with GITAM, AP)	2023	2026	To standardize the effective dose of various polyamines that enhances egg production of muga and eri silkworms (CMERTI and GITAM). To understand the mechanism by which polyamines enhance fecundity and egg production of muga and eri silkworms (GITAM). Field trials with selected concentrations of polyamine (CMERTI).	The problem of inadequate seed supply can be addressed if the enhancement of fecundity ratio by polyamines in muga and eri silkworms proved at lab scale and is tested at farm level. The new method developed in the project will be given to seed production centres for testing. Identification of genes involved in testicular development that help in enhancement of fertility. Enhancement of sperm count, sperm maturity, sperm motility, fertilization, number of eggs produced and fertility ratio through application of polyamines. Enhancement of farm level muga and eri egg production	00*
6	(Approved by 66th RC)	Adoption of Improved Technologies of Muga Culture for Enhancing Cocoon Production in Manipur	July 2023	June 2026	To promote adoption of improved Muga rearing technologies among rearers. To improve the socio-economic status of rural population of Manipur by enhancing cocoon production through improved muga culture.	This study will help to boost production and productivity of muga silk in Manipur by adopting improved technologies of Muga culture and development of clusters of muga rearers in the districts.	6.0
7	(Approved by 66th RC)	Evaluation of suitable model for Muga & Eri based integrated farming system	July 2023	June 2026	To identify the existing muga and eri based IFS in different locations To ensure optimal utilisation of available resources in existing IFS for different farming situations To assess economics of different	Efficient resource management for increasing productivity in the cropping system with muga and eri Effective recycling of products, by-products and waste material Increase farm income economic	15.0

#	Code	Title	Start	End	Objectives	Expected output	Budget allocation
					components of IFS for evaluating suitable IFS model comprising with muga/eri enterprises	yield/income per unit area	
8	In pipe-line (Concept presented in 66th RC)	Cost benefit analysis of Tapioca for Eri Rearing	July 2023	June 2026	To study the cost benefit analysis of tapioca with respect to eri rearing. To study the rearing performance of the eri silkworms	Cost benefit ratio of eri rearing with tuber production. Doubling the farmers' income. Popularisation of Eri rearing innon traditional area. Sustainable income from the diverse crops. Motivate the youths to take up eri culture in large scale.	6.0

1.2. With CI from the Institute (Collaborative projects with other CSB institutes)

Annex-5.I.4

1.2.1. Ongoing projects during the year 2023 -2024 (Rs. Lakhs)

#	Code	Title	Start	End	Milestones to be crossed	Progress to be achieved	Budget allocation
At main institute							
1	AIB 08008 MI	Development and evaluation of Eri silkworm (*Samia ricini* Donovan) breeds/ hybrids with improved productivity (SBRL)	Mar 2022	Feb 2025	Maintenance of genetic stock (pure ecoraces /strains). Supply of materials to SBRL Rearing of crossed strains	Gene pool maintenance. Evaluation of hybrids	1.10

Annex-5.I.5

1.2.2. Projects to be concluded during the year 2023 -2024(Rs. Lakhs)

#	Code	Title	Start	End	Progress output	Utility of out-put/ Impact on silk industry	Budget allocation
At main institute					Nil		

Annex-5.I.6

1.2.3. New projects to be initiated during the year 2023 -2024 **(Rs. Lakhs)**

#	Code	Title	Start	End	Objectives	Expected output	Budget allocation
					Nil		

2.0. Transfer of Technologies (ToTs) Programmes to be taken up during the year 2023 -2024

Annex -5.II.1

2.1. On Station Trials (for validation of technology at CSB institutes/ RSRSs/ DoS units etc.) **(Rs. Lakhs)**

#	Name of the Technology	Unit Cost (lakh)	At CSB institutes	RSRSs	DOS Units	Total No.of trials	anticipated impact	Budget allocation
1	**On station multi-locational trials of muga and eri silkworm breeds/cross breeds/eco-race**							
1.1	Multi-location trials of muga breeds CMR-1CMR-2	0.20	01	05	-	**06**	New muga breeds as per HAC norms	1.20
1.2	Multi-location trials of Eribreeds/crossbreeds	0.15	01	-	09	**10**	New eribreeds/cross breeds as per HAC norms	1.50
1.3	Popularization of Eri C2 breed and Borduar eco-race in Manipur	0.08	--	02	03	**05**	10-15 % increase in ERR as against Manipur local	0.40
2	**On station trials of Muga silkworm Seed PreservationTechnology**							
2.1	Development of seed preservation technology for Muga silkworm	0.45	02	-	-	**02**	To skip unfavorable season for seed production	0.90
3	**OnstationtrialsofMugasilkwormeggtreatment(heat)foruniformhatchingandhigher survivability of young larvae**							
3.1	Validation of Muga silkworm egg treatment for uniform hatching and higher survivability of young larvae	0.07	03	01	-	**04**	Uniform hatching & survive-ability of worms	0.28
4	**Summer crop management in Muga (in coordination with MSSO,Guwahati)**							
4.1	Rearing management of Muga silkworm in cooler region during summer	0.20	01	05	-	**06**	Identification of new areas for summer rearing of muga silkworms.	1.20

4.2	Trial of formulated volatiles application for enhancing egg laying capacity of Muga silk moth during commercial crop.	1.25	01	01	-	**02**	Enhanced egg laying capacity in Muga	2.50
4.3	Trial of formulated volatiles application for enhancing egg laying capacity of Eri silk moth during commercial crop.	1.00	01	01	-	**02**	Enhanced egg laying capacity in Eri	2.00
5	**On station trials of Muga Post Cocoon Technologies**							
5.1	On station trials of Muga Super Cook formulation.	0.10	02	03	05	**10**	Improvement in silk recovery, luster and reduced cooking time	1.0
5.2	On station trials of Honey comb mountages for Muga	0.10	02	04	02	**08**	Uniform and compact cocoons	0.80
					Total	**55**	**11.78**	

Annex-5.II.2

2.2. On Farm Trials (for demonstration of Technologies at farmers' level) **(Rs. In lakhs)**

#	Nameofthe Technology	Unit Cost (Rs.)	No.of locations	No. of Stakeholders	Anticipated impact	Cost
1	**On farm trials (popularization) of improved perennial host plant of eri silkworm**					
1.1	Popularization of Kesseru Erihost plantHF005 and HF008	2,210	05 (Imphal, Lakhimpur, Boko &other parts of Upper & Lower Assam)	400	Popularization of superior host plants of muga and eri silkworms will augment quality leaf production in the field leading to enhanced cocoon production per unit area.	8.84
1.2	Popularization of Borpat Eri host plant					
1.3	Popularization of other host plants					
2	**On farm trials of silkworm protection formulations, devices and practices for higher productivity (eri silkworm)**					
2.1	Evaluation andpopularizationofEriegg incubationdevice	1,050	3 (Upper and lower Assam)	30	Uniformity and Improvement in hatching percentage	0.32
2.2	Formulation forcontrolling bacterialflacheriedisease inMugasilkworm	1,000	5 (5 districts)	50	Control in bacterial flacherie will reduce the crop loss.	0.50

2.3	Popularization of eri chawki rearing technology in the farmers field	2,500	5	100	Promotion of Micro eri CRC among the farmers / self-help groups to create an entrepreneurship in the potential areas of Ericulture and to increase the cocoon yield and income of farmers.	2.50
3	**Integrated on farm trials of technologies for higher productivity in oak tasar rearing**					
3.1	Establishment and Popularization of new breed C27amongfarmers.	6,000	3 (locations in Manipur)	15	Cocoon yield of 38-40 cocoons /dfl as against 28-30 cocoons in control	0.90
3.2	Validation of use of PET bottles for uzi trap in oak tasarsilkworm rearing	5,000	3 (locations in Manipur)	30	Percentage of Uzi infestation below 15%	1.50
3.3	Validation of use of Sodiumhypo-chlorite for seed treatment against tiger band disease of oaktasar silkworm.	6,000	3 (locations in Manipur)	15	Cocoon yield of 38-40 cocoons /dfl as against 28-30 cocoons in control	0.90
4	**OFT of technologies developed for integrated pest management in Oak tasar rearing**					
4.1	Validation of IPM technology for control of uzi fly in oak tasar culture	3000	3	15	Percentage of Uzi infestation below 10%	0.45
4.2	Validation of use of Biopesticides for control of insect pest infesting *Q. serrata.*	3000	3	15	70-72% reduction in infestation	0.45
		Total	**33**	**670**		**16.36**

Annex-5. III

3. Capacity Building & Training programmes to be conducted during 2023 -2024

(Rs. in lakhs)

#	Title of the training programme	Unit cost (Rs)	Target		
			No of programmes	No of stake holders	Budget proposed
3.1	Structured Training Course*	-	-	-	-
3.1.1	PGDS	-	-	-	-
3.1.2	Intensive Sericulture Training	-	-	-	-
3.2	Farmers Skill Training	4500	18	450	20.25
3.3	Exposure visit for technology awareness	-	-	-	-
3.4	Technology Orientation Programme	3800	10	250	9.50
3.5	Sericulture Resource Centres (SRCs)	--	45	900	6.75*
3.6	Training under Post Cocoon Sector (Vanya silk reeling and spinning -5 days)	3000	6	150	4.50
3.7	Management Development Programme under STEP	0.016	2	50	0.80
3.8	Training for Adopted Seed Rearers (ASRs)	-	-	-	-
3.9	Training to Registered Seed Producers (RSPs)	-	-	-	-
3.10	Training on Seed Act	-	-	-	-
3.11	Hands on training on chawki rearing	--	2	40	--
3.12	Establishment of new SRCs	4.0	5	--	20.0
3.13	Other Need Based Training Programme				
3.14	**Non-CBT:** Training programme funded by agencies other than CSB*	-	5	100	-
3.15	**Training under SAMARTH *****	-	-	-	-
3.15.1	Pre-cocoon (Silkworm rearing)	-	-	-	-
3.15.2		-			-
3.15.3	Post cocoon – Handloom (Designing & Weaving)	-	-	-	-
	Total		**93**	**1940**	**61.80**

**An amount of Rs.0.75 Lakhs (Max) can be spent under each existing SRC towards opex. (9x0.75=6.75)*

Annex-5. IV

4. Extension Communication Programmes to be conducted during 2023-2024 (Rs. In lakhs)

#	Programmes	Unit cost (Rs.)	Target		
			No of programmes	No of stakeholders	Budget allocation
4.1	Krishi Mela/ Reelers mela cum exhibition	3.00 1.50	3	800	6.00
4.2	Farmers Field day	0.15	8	560	1.20
4.3	Awareness programme	0.10	30	1500	3.00
4.4	Technology demonstration / Enlightenment programmes	0.01	30	600	0.30
4.5	Workshop/ Seminars & Conferences	2.00	2	200	4.00
4.6	Other activities	-	-	-	-
	Total		**73**	**3660**	**14.50**

Annex-5.V

5. Soil samples to be tested/analyzed during the year 2023 -2024

#	State	Target	
		Physical (No)	Budget allocation(Rs in Lakhs)
5.1	Assam	20	0.24
5.2	Manipur	10	0.12
5.3	Nagaland	10	0.12
	Total	**40**	**0.48**

Annex-5.VI

6. Information, Education and Communication-2023 -2024 **(Rs in Lakhs)**

#	Item	Target (No.)	Budget allocation
6.1	Periodicals	3	1.50
6.2	Publications		
6.2.1	Research papers-National	10	0.20
6.2.2	Research papers-International	15	0.30
6.2.3	Proceedings/ Abstracts	10	1.00
6.2.4	Books/ Book Chapters/ Manuals etc.	10	2.00
6.2.5	Popular Articles	10	--
6.2.6	Booklets, Brochures etc.	10	1.50
6.3	Extension literature	10	1.00
6.4	Films/ Videos	15	0.50
6.5	Social media	100	--
Total		**193**	**8.00**

Annex-5.VII

7. Technology to be filed for Patent /grant of patent, technologies to be Commercialized/ Productsto be Developed during 2023 -2024 (Rs. In lakhs)

#	Item	Patent No., Date of filing patent by NRDC, Technology commercialised to & Date of licence.	Target	
			Physical (No)	Budget allocation
7.1	**Patents filed**			
7.1.1	Technology for enhancing egg-laying in Muga	-	01	1.00
7.1.2	Technology for enhancing egg-laying in Eri	-	01	1.00
7.2	**Patents granted**	-	--	--
7.3	**Technologies commercialized**			
7.3.1	Commercialization of Muga super cook	-	01	--
7.4	**Android/mobile app, software developed etc.**			
7.4.1	Mobile app for identification of pebrine disease	-	01	6.0*
		Total	**04**	**2.00**

**The cost is already covered under ongoing pilot study. Hence, not added to total budget requirement.*

Annex-5.VIII

8. Procurement of equipments and other accessories proposed for the year 2023 -2024 (Rs in Lakhs)

#	Items/ equipments/ other accessories	Justification	Target	
			Physical(No)	Budget allocation
8.1	Portable microscope with screen display	Under new project on Disease surveillance	06	09.00*
8.2	Purification system for molecular biology grade water	Under new project Biotech Hub (DBT funded)	01	05.00#
8.3	Humidifiers	For eri rearing and grainage purpose	07	2.80
8.4	Dehumidifiers	For eri rearing and grainage purpose	03	3.00
8.5	Chawki leaf chopping machine (portable)	For demonstration of eri chawki rearing at field level	01	0.40
8.6	High Pressure disinfection Sprayers (Sericulture purpose)	For disinfection of eri chawki rearing house, late age rearing house, grainage etc.	04	1.20
8.7	Battery operated powder duster	For uniform dusting of lime on eri chawki and late age worms	06	0.60
8.8	Plastic Tray Washing Machine	For washing of plastic trays used for chawki rearing, late age rearing, grainage etc.	02	0.80
8.9	Petrol run Power Generators (portable generator)	For continuous power supply to the Model Eri CRC of CMER&TI and also useful for conducting demonstration of eri chawki rearing at remote villages	01	0.50
8.10	Vacuum cleaner (wet /dry cleaner with >35 litres capacity and high suction capacity)	For cleaning grainage, rearing houses (chawki & late age), office, hard surface and carpet	02	0.80
8.11	Wheeled brush cutter	For weed management in eri and muga host plant fields and office premises.	05	1.50
8.12	Wheeled brush cutter	For weed management in eri and muga host plant fields and office premises.	02	0.60
8.13	Clinometer	Required to measure elevation angle of the host plant trees under Soalu Project.	01	0.35
8.14	Leaf Spectrometer	This is required for the real time analysis of important biochemical parameters of Soalu leaf samples. The analysis will be non-destructive and will help in identifying stress tolerant accessions.	01	8.50
8.15	Water purification system	This is required for producing distilled water for biochemical analysis and DNA isolation related works.	01	4.50

8.16	Plant Growth Chamber	This is required for the propagation of superior host plant of muga and eri silkworm under the project.	01	10.0*
8.17	Electric bikes	For commuting between different farms	03	03.00
8.18	High power Binocular	Required for survey of host plants in natural forest areas under germplasm evaluation programme.	02	1.00
8.19	Pruning Saw	Use for pruning of Som plantation.	02	1.00
8.20	Ultrasonicator	Instrument is required for DNA/RNA extractions and biochemical extractions.	01	1.50
8.21	Liquid nitrogen cylinders/container	Using for different Research Projects for storing liquid nitrogen which is essential component in DNA/RNA extractions.	02	1.50
8.22	Digital autoclave	se for easy & quick sterilization.	01	1.50
8.23	BOD incubator	For eri and muga dfls incubation	02	2.00
8.24	pH meter	Required for analysis of soil samples in Soil laboratory	01	0.50
8.25	EC meter	Required for analysis of soil samples in Soil laboratory	01	0.50
8.26	Dying equipments and accessories	For fabric dying for training and regular work in the section.	01	1.00
8.27	Compound Microscope	For Muga/Eri moth examination.	01	0.75
8.28	Automatic Drilling Machine	For pit digging to transplant Host plants.	01	1.00
8.29	Pocket/Mobile projector	For using quick presentation or showing relevant photograph during field of farmers.	03	0.90
8.30	Portable public address system	For conducting farmers meeting or group discussion in different remote areas.	01	0.50
8.31	Sliding glass display board	For arranging exhibition during Krishimela or farmers meet, awareness etc.	01	0.12
8.32	Pruning Saw	Use for pruning of Som plantation.	02	0.70
8.33	Desktop	There is dearth of desktops at Institute as most of the staff is without computers or working on slow obsolete desktops. [In 2021-2022, 20 No. of desktops were declared unserviceable by SVO and were disposed off in 2022.	07	4.0
8.34	Laptops	01 for computer section, 01 for PMC for online anywhere meetings. [In 2021-2022, eight laptops were declared unserviceable by SVO and were disposed off in 2022.	02	2.0

8.35	Printers	03 duplex printers for Admin/account section, 02 duplex B/W printers for other divisions.	05	1.5
8.36	Structured LAN	Presently there is no structured LAN at Institute.	01	15.0
8.37	Furniture/rearing stands/racks etc and other equipments	For utilization in different laboratories, eri and muga grainages and rearing houses (including model eri chawki CRC)	30	15.0
8.38	Power Tiller	The existing power Tillers are very old and require frequent repairing, hence it is proposed to purchase power tiller for ploughing in the field.	02	5.00
8.39	Cultivators for tractors	For ploughing of eri and muga host plants plots of CMER&TI	03	2.00
8.40	Furrow and ridge makers for tractors	For making furrows and ridges for castor and other plantation at CMER&TI	02	1.50
8.41	UV Spectrophotometer	Required for analysis of soil and plant samples in Host Plant Division	01	3.50
8.42	Irrigation system at Germplasm conservation at CMER&TI Chenijan Farm (Portable sprinkler based)	Essential for Germplasm conservation maintained at Chenijan farm and also during different cropping season.	01	15.0
8.43	Borewell facility with submersible pump for Farm-2 Lahdoigarh	To create irrigation facility for host plants being maintained at Farm-2	01	2.00
8.44	Creation of drainage system at CMER&TI main campus and Cinammara Staff quarter campus	No drainage system exists in CMER&TI main campus and the drainage system of Cinammara Staff quarter campus is faulty due to raising of height of main road.	--	15.0
8.45	Advanced Photocopy machine	For official use	01	10.0
8.46	Interactive Panel	Required for trainings/meetings etc	02	8.00
8.47	Statistics Software (05 user)	For statistical analysis of results generated under various R&D projects.	01	3.0
8.48	Leaf Moisture Meter	Required for estimation of leaf moisture for successful rearing	01	1.00
8.49	Automatic weather station for CMER&TI Campus	For recording weather parameters	01	5.00
			Sub-Total	**151.52**
At nested units				
RSRS, Boko				
8.50	Construction of Store Room at RSRS, Boko	For storing the store materials	01	8.00

8.51	BOD Incubator	For incubation/preserving dfls	01	1.00
8.52	Generator Set (50 KVA)	For continuous power supply.	01	4.00
8.53	Centrifuge	For mother moth examination	01	0.30
8.54	Petrol Operated pruning Saw	For pruning of plantation	02	0.60
8.55	Petrol operated grass cutter	For cutting of grass in plantation & internal road	01	0.60
8.56	Furniture & Other Equipments	For use in different laboratories	--	3.00
			Sub-Total	**17.50**
RSRS, Imphal				
8.57	Humidifiers	For oak tasar grainage hall	04	2.00
8.58	Air Conditioners	For oak tasar grainage hall	04	2.00
8.59	Power weeder	For the purpose of deweeding, ploughing and ridge forming in the rearing field	01	1.70
8.60	Automatic Drilling Machine	For pit digging to transplant Host plants and fertilizer application	01	1.00
8.61	Portable public address system	For conducting farmers meeting or group discussion in different remote areas.	01	0.50
8.62	Repairing/painting of RSRS, Imphal Office Complex.	The Office building need repairs to fix seepage, leakage and for face lifting.	--	3.00
8.63	Furnitures and Other Equipment's	For use in different laboratories		1.50
8.64	Printer	01color printer for Admin/account section	01	0.30
			Sub-Total	**12.00**
			G. Total (A)	**181.02**
Maintenance of Existing infrastructure/ Asset				
8.65	Up-gradation of water filtration unit at CMER &TI, Training Division, Farm No.-1,Lahdoigarh.	For improving quality drinking water facility, it is proposed to up-grade water filtration unit at CMER&TI Training complex, Farm No.-1, Lahdoigarh.	01	15.0
8.66	Fixing of Concertina Coil over Boundary wall of Staff Quarter Complex,Cinnamara.	Required for safe guarding the CSB staff quarter complex, Cinnamara.	--	20.0
8.67	Repairing/painting of Staff Quarters Building of CMER&TI, Quarter Complex,	The staff quarters need repairs to fix seepage, leakage and for face lifting.	--	15.0
8.68	Multipurpose Community hall / Common facility Centre at Cinammara Staff quarters	For various community base programmes and meetings	01	90.0
8.69	Repairing and enrichment of Institute museum	Museum of the Institute to be shifted to ground floor for which repairs of the hall are required. Museum to be enriched with materials to display.	01	10.0

8.70	Up-gradation of Conference Hall at CMER&TI, Lahdoigarh	For various meetings, seminar and workshop at CMER&TI.	01	6.0
8.71	Maintenance of other existing assets	All institute assets maintenance as and when required	--	80.0
			Total (B)	**236.0**
Grant total of Items/equipments/ other accessories (A) & maintenance of existing assets (B)				**417.02**

**The equipment cost is already covered under the ongoing/concluding/new projects; hence the cost is not included in the total budget requirement.*
#To be procured under external funded projects (Not included in total)

Annex-5.IX

9. Other activities to be carried out during the year 2023 -2024 **(Rs in Lakhs)**

#	Activity	Justification	Budget allocation
9.1	Pilot project (PS-005-MTS)	Method for Pebrine (*Nosema sp.* Aa1) Detection Using Artificial Intelligence and Machine Learning Models	**7.5**
9.2	Raising of seedlings/ saplings of eri and muga host plants	To meet the demand of improved varieties and for popularization in the field.	**1.0**
9.3	Oak Tasar silkworm rearing, DFLs production and supply	To meet the seed supply demand for North east and North west India	**1.0**
9.4	Activities under Swatch Bharat Abhiyan	Various activities to be carried out under swatchta abhiyan during the year	**3.0**
		Total	**12.50**

Annex-5.X

10. Revenue Generation during 2023 -2024 **(Rs. in Lakhs)**

#	Source of Revenue Generation	Physical (No.)	Revenue to be generated
10.1	**Patent (Technology)**		
10.1.1	License Fee collected		-
10.1.2	Royalty collected		-
10.2	**Testing & Analytical charges (Sample)**		
10.2.1	Testing of Soil/water/FYM/ Leaf etc		0.50
10.2.2	Quality analysis/ testing of products		0.0
10.2.3	Testing of cocoons/silk yarn/fabric etc.		0.0
10.3	**Consultancy (Services)**		1.0
10.4	**Supply/ sale proceeds of cutting / Sapling/ seedling/ chawki worms/ cocoons/ Silk etc**		
10.4.1	Mulberry cutting		**0.0**
10.4.2	Vanya host plant sapling/ seedling	20000	2.0
10.4.3	Mulberry chawki worms		0.0
10.4.4	Mulberry Seed (DFLs)		0.0
10.4.5	Vanya seed (DFLs)		0.0
10.4.6	Cocoons/pierced cocoons/		2.0
10.4.7	Output from R&D Projects (Silk, fabric etc)		5.0
10.4.8	Others (pl specify)		
10.4.8.1	Guest house /Hostel charges		4.0
10.4.8.2	Licenses fees		9.0
10.4.8.3	Convenience charge		0.35
10.4.8.4	Other Misc. receipt (excess payment recovery, computer advance recovery, auction proceeds, etc.)		10.0
10.4.8.5	Course fees		1.20
10.4.8.6	Intercropping in between Som, Kesseru etc.		0.95
10.4.8.7	Electricity refund		0.0
		Total	**34.00**