

CONCLUDED RESEARCH PROJECTS WEF 2012-13 TO 2022-23 (Till Dec, 2023)

SL. NO.	PROJECT CODE	PROJECT TITLE	OBJECTIVES	PI	CI'S	CONCLUDED YEAR	OUTCOME OF THE REASERCH PROJECT
1	CFW 7048	Study of piling resistance of eri silk knits	To develop flat bed Eri silk knits from mill spun Eri yarn. To study interrelationship between yarn, fabric properties and piling resistance of eri silk knits. To quantify the piling resistance of these fabric and at the same time study the nature of piling.	Jameela Khatoon	Arindam Basu-PC	2012-13	From the project, it was concluded that the factors which affect the pilling resistance of knits are yarn properties, fabric properties and the finishing treatment given to the fabric. It can be inferred that among the yarn properties, evenness, evenness CV and loop length, courses per cm, wales per cm, and tightness factor in the case of 2/80 s and evenness CV in the case of 2/120 s contribute significantly to the pilling resistance of the knits produced from these yarns.
2	CYF 7049	Investigation on causes for poor dimensional stability of tasar fabrics and remedial measures	To investigate into the causes for poor dimensional stability of tasar fabrics. Developing physico-chemical methods of treatment of fabrics to improve dimensional stability of fabrics. To study the physical and comfort properties of the treated fabrics for validation of treatment methods.	G. Thimmareddy	H.H. Shambulingappa-CI Aswatha Reddy-CI Arindam Basu-PC	2012-13	(i) It was concluded that shrinkage was mainly due to imbalance in use of warp (very thin) and weft (very thick) denier and non uniform yarn in weaving (ii) Proper selection of construction particulars such as ends and picks / inch, twist will decrease the shrinkage of tasar fabrics (iii) Steamed yarn shrinkage is 8-9%, hence use of steamed yarn in weaving process may partly decrease the shrinkage % of tasar fabrics (iv) BTCA treatment was found to reduce the shrinkage to almost zero after 2nd wash. Further, it significantly improved crease recovery angle and tearing strength of tasar fabrics. There was no effect on tensile properties.
3	CFC 7050	Application of silver nano particles synthesised using sericin for imparting durable antimicrobial properties to silk textiles	To standardize the process of synthetic of silver nanoparticles and their characterization. To standardized the process of application of AgNP on to silk substrate. To investigate the effectiveness of AgNP against microorganism in textile materials and to evaluate the technological, dermatological and ecological aspects of the finish. To investigate the effect of repeated laundering (upto 10 cycle) on the retention of antimicrobial properties.	Prakash N. Bhat	Nivedita S-CI Arindam Basu-PC	2011-12	Standardized the process of synthesis of silver nano particles. Standardized the process of application of AgNP on to Silk substrate. The AgNP applied silk substrate shown antimicrobial activity. The treated samples showed non cyto-toxicity to human skin.
4	CFC 7051	Study of comfort properties of silk woven fabrics and modification of the same with plasma treatment	To develop and characterize loom finished and grey finished silk woven fabrics with respect to the comfort properties of these fabrics To develop means of improving the comfort properties of these fabrics	Jameela Khatoon	M.K. Ghosh-CI K.Jaganathan-CI M.A. Joseph-CI Sheetal Palaskar-CI Arindam Basu-PC	2014-15	This project was conceived with twin objectives. The first one was to develop and characterise loom finished silk woven fabrics with respect to the comfort properties of these fabric and the second was to develop means of improving the comfort properties of these fabrics. Accordingly two varieties of silk woven fabrics were developed with two weaves and varied structural parameters and were evaluated with respect to the comfort properties. It was observed that the changes in structural parameters can improve the comfort properties of these fabrics and some varieties can be ideally suitable for both winter and summer applications and also cater to the requirements of both mens shirtings and ladies blouses. These fabrics were subjected to Plasma treatment and were evaluated with respect to the comfort properties. It is observed that when these fabrics are subjected to plasma treatment, the comfort properties are influenced by the treatment but the difference is insignificant.
5	CYR 7052	Development of energy efficient re-reeling machine to reduce fuel consumption in a multiend silk reeling unit	To devise an energy efficient re-reeling process / system to save energy	Vijaykumar P. Kathari	Subhas V Naik-CI K.N. Mahesh-CI B.G. Patil-CI Arindam Basu-PC	2014-15	4-window re-reeling machine has been developed. Using this machine there can be significant saving in the energy used for re-reeling of silk yarn.
6	CYR 7053	Development of technology package for proper handling and processing pupae by-product for effective utilization	The project was taken with the following objectives to develop a package for proper handling and processing pupae byproduct for effective utilization and better earnings. • To develop Indigenous pelade waste extraction plant • To develop Indigenous hot air drier for drying the pupae • To develop drying parameters for drying the pupae using hot air drier. • To study the working performance and recommend the suitable pupae processing package	Subhas V. Naik Dr.	G. Hariraj-CI B. M. Mahadevaiah-CI Arindam Basu-PC	2013-14	The following technology packages have been developed. Pelade waste extraction methodology for pupae of steam stifled / semi dried cocoons along with required equipments. Pelade waste extraction methodology for pupae of hot air dried cocoons along with required machinery.
7	CYR 7054	Modifications in the existing reeling and spinning machines for commercial utilization in tasar	To incorporate modifications in MRTM, Wet Reeling Machine, Anna Reeling Machine and Spinning Machine, so that the quality and productivity can be improved and thereby enhancement of daily earnings of reelers and spinners.	M.A. Moon	T.K. Paul-CI A.K.Pal-CI Gautam Mitra-CI U.C.Javali-CI D. Chattopadhyay-CI Madhabananda Ray-CI K. Sathyanarayana-CI Arindam Basu-PC	2013-14	Modifications of existing machines have been successfully achieved to develop new machines.
8	CYR 7055	Studies on tasar cocoon cooking methods and development of cooking device	To study the influence of different methods of cooking processes on reelability performance of tasar cocoons. To arrive at best cooking process amongst the above and to optimise the cooking method. To design and develop suitable cooking device. To evaluate technical and economic viability of the cooking device and cooking methods.	Uday C Javali	Saurav Mazumdar-CI SreenivasaCI H. Rudranna Gowda-CI N. S. Gahlot-CI Naveen V. Padaki-CI Arindam Basu-PC	2013-14	Different methods of tasar cocoon cooking viz., traditional, enzymatic and chemical methods have been studied. Chemical method of tasar cocoon cooking using Sodium Perborate has provided best results with respect to retention of natural colour of tasar silk and improved cooking efficiency, silk recovery and reelability %. Permeation chamber has been successfully used as cooking device to cook tasar cocoons in bulk quantities (at least 400 per batch) at field level.

9	CYR 7056	Design and development of automatic silk reeling machine for Indian filatures for production of international / superior grade raw silk from multi-bivoltine and bivoltine hybrid cocoons:	To develop a Automatic Raw Silk Reeling Machine for the Production of international / superior grade raw silk from Indian Multi-bivoltine and Bivoltine hybrid cocoons with less labour requirement. To study the working performance of the developed Automatic raw silk reeling machine with both Multi-bivoltine cocoons and Bivoltine hybrid cocoons. To standardise the reeling parameters for Automatic reeling machine for reeling Multi-bivoltine and Bivoltine hybrid cocoons on for the production of international / superior grade raw silk. To popularise the Automatic raw silk reeling machine in the field.	Subhas V. Naik Dr.	G. Hariraj-CI B. M. Mahadevaiah-CI J. Ramappa-CI Arindam Basu-PC	2015-16	Fabrication of Automatic silk reeling machine with automatic mechanical brushing unit as per the CSTRI design and technical specifications is completed successfully.
10	CYS 7057	Studies on comfort properties of Eri silk wool blended fabric for winter wear applications	Study the basic parameters of wool and silk fibres. Blending of wool and eri silk at different proportions and development of woven and knitted fabric sample. Evaluation of the impact of blending on comfort properties of wool/ eri silk blended yarn and fabric. To optimize the blend proportion of eri silk / wool fibres with respect to the comfort properties suitable for winter wear applications.	Brojeswari Das Dr.	Naveen V Padaki-CI K. Jaganathan-CI Subhas V Naik-PC	2014-15	The project was taken up with the objective of evaluating the impact of blending on thermo physiological and aesthetic comfort of fabric developed with wool/ eri silk blended yarn and also determine the effect of fabric weight' and weave on the same. Along with 100 % eri and wool fabric three different eri-wool blended yarn fabrics were developed. The blending was done at draw frame. Blended fabrics were subjected to the testing of physical properties, thermo physiological and aesthetic comfort properties. Based on the test results, the blend proportion has been optimized for the development of winter wear clothing.
11	CYR 7058	Fine tuning of cocoon quality index (CQI) for unfavourable season	To study the cocoons reared in unfavourable season for cocoon characteristics and reeling performance and fine-tune the present CQI for Unfavourable season for both multibivoltine and bivoltine cocoons. To study the accuracy of fine-tuned CQI by adopting the same in cocoon markets during unfavourable seasons for estimating the renditta.	J Ramappa	Subhas V. Naik-CI G. Hariraj-CI M.K. Ghosh-PC	2014-15	175 MV and BV cocoon lots procured were reeled. The data of reelability of cocoon lots were computed and analysed. Based on the analysis, fine-tuning of the present CQI has been worked for unfavourable season for both multibivoltine and bivoltine cocoons.
12	CFC 5059	Studies on the Abrasion Resistance of Silk Upholstery Fabrics	To study the influence of fabric structure on abrasion characteristics of upholstery fabrics. To optimize the fabric parameters and chemical finishing process to improve the abrasion resistance of silk upholstery fabrics along with other functional properties, i.e. flame retardancy and stain guard property.	K. Jaganathan	Brojeswari Das-CI M. A. Joseph-CI Naveen V Padaki-CI Subhas V Naik-CO	2015-16	Significant improvement in abrasion properties of silk upholstery fabrics has been achieved through modification of fabric structure and by applying chemical finish.
13	CYF 5060	Design and development of silk based composite biomaterials for wound dressing applications	To optimize the fabric parameters and chemical finishing process to improve the abrasion resistance of silk upholstery fabrics along with other functional properties, i.e. flame retardancy and stain guard property. To study physical and mechanical properties of these silk based multilayered composite materials. To evaluate biocompatibility (toxicological) and biodegradability characteristics of different silks and developed silk composites for wound dressing applications. To design and optimise silk based bio composite materials with tailorable biodegradability for wound dressing applications.	Naveen V. Padaki Dr.	Uday C Javali-CI Brojeswari Das-CI Sabareeswaran-CI Subhas V Naik-PC	2015-16	Composite specimen characterization, Mechanical and Biocompatibility have been completed. Biodegradability tests based on enzymatic degradation method have been successfully conducted. Optimised product parameters established.
14	CYR 5061	Study of evaluation of muga cocoon stifling processes on reeling performance and quality of muga raw silk	Study the influence of muga cocoon stifling process using electrical dryer with respect to temperature and time on the reeling performance. Optimize the stifling process to yield maximum raw silk using minimum energy. Study the muga cocoon storage conditions and understand its influence on reeling performance. Study the muga cocoon storage conditions and understand its influence on reeling performance.	S. N. Mishra	Aswatha Reddy-CI Ravi Kumar D-CI Subhas V Naik-PC	2015-16	Technology for electrical stifling of muga cocoons has been standardized in terms of Temperature & Stifling duration Influence of cocoon storage has also been studied.
15	CED 7062	Development of automatic conveyor cocoon drying machine	Design and Fabrication of Conveyor Cocoon Drying Machine. Standardisation of Drying parameters for both Indian Multi-bivoltine cocoons and Bivoltine hybrid cocoons.	Subhas V. Naik Dr.	G. Hariraj-CI B. M. Mahadevaiah-CI Subhas V Naik-PC	2014-15	1. Indigenous automatic conveyor hot air drier has been developed for the first time in India. Using the technology the drier can be manufactured in different capacities. 2. Technology of drying the Indian cocoons in Indigenous automatic conveyor hot air drier has been developed.
16	CYR 7063	Finance to the mulberry silk reeling sector – A study on flow, needs, gaps and way forward	To study the present status of institutional credit flow to the silk reeling sector. To estimate the financial needs and gaps of silk reeling units, both fixed and working capital. To study the problems involved in the institutional credit flow to the sector. To suggest measures to improve the institutional credit flow to the sector.	C. R. Nagaraj	Subhas V. Naik-CI K.N. Mahesh-CI S.B. Murgod-CI M.G. Mahesh-CI A.K. Pal-CI Surinder Bhat-CI M.K. Ghosh-PC	2014-15	The flow of institutional credit to the silk reeling sector has been studied which shows that the credit flow is very low as compared to other sectors. Significant difference was found between the availability and requirement of working capital of the reeling units in the selected clusters. Some of the main problems in availing credit were inadequate loan amount, procedures, security, previous default, etc. The final report preparation is under progress.

17	CFC 7064	Characterisation of silk sericin for cosmetic applications	To standardize a suitable technology to recover (on commercial scale) sericin from pressurized degumming liquor. To characterize the sericin for cosmetic (soaps, shampoos, hair creams and as an additive for talcum powder) applications. To produce different cosmetic products such as soaps, shampoos and hair creams with the extracted sericin.	M.A. Joseph	S.A. Hipargi-CI Subhas V. Naik-CI Subhas V Naik-PC	2016-17	Standardised HTHP extraction (degumming of silk) of sericin from silk yarn in the Hank form and recovered sericin from the degumming liquor by low temperature evaporation, spray drying and freeze drying Characterised Mulberry silk sericin for its moisture content, ash content, protein content, molecular weight, heavy metal content, etc. Produced cosmetic products with the help of the R&D Centre, M/s. Unilever Industries, Bangalore.
18	CFC 7065	Biofinishing of tasar silk fabric using enzymes	To develop eco-friendly biofinishing process for tasar silk fabric using enzymes. To analyze the enzymatic biofinishing effect on mechanical properties of the tasar silk fabric. To understand and evaluate the influence of biofinishing on comfort properties of the silk fabrics and To optimize enzymatic biofinishing process for commercial applications and thereby attempt technology transfer to silk industry.	Brojeswari Das Dr.	K. Jaganathan-CI Sreenivasa-CI Subhas V Naik-PC	2016-17	Trials using different enzymes on tasar fabrics have been done. Standardization of the doses has been done. Properties of enzyme treated fabric samples have been evaluated. Study on the comfort properties has been done. Biofinishing of tasar silk fabrics with enzymes has enhanced the properties of fabrics in terms of aesthetic and thermo-physiological comfort significantly. Enzyme treated fabric ideally suitable for dress material applications. Enzymatic biofinishing process for silk fabrics has been standardised for commercial applications.
19	CFC 7066	Development of easy care finish for wash and wear applications on silk fabrics	To evaluate the easy care properties of the silk fabrics especially soft silk fabrics used in silk industry such as dimensional stability, crease resistance, wrinkling behavior, pilling performance and abrasive wear behavior. To develop and evaluate chemical finishes on the silk fabrics to improve the easy care properties of silk fabrics.	K. Jaganathan	Brojeswari Das-CI Subhas V Naik-PC	2016-17	Easy care finish for wash and wear applications for soft silk fabrics has been developed. Various combinations of finishing treatment using chemicals / resins have been developed
20	CYF 7067	Development of eri silk based nonwoven fabrics as facial masks for cosmetic applications	Manufacture of eri silk nonwoven fabric of desired quality for facial mask applications. Evaluation of eri silk nonwoven fabric's physical and mechanical properties. Development of sericin based recipe for application on eri silk nonwoven fabric for facemask application. Evaluation of facemask samples prepared from the above techniques in terms of hydration efficiency and other facial mask characteristics.	Naveen V. Padaki Dr.	Uday C Javali-CI Gaurav Agarwal-CI Subhas V Naik-PC	2016-17	Feasibility studies on degummed eri silk fibres for spunlace (wetlaid) nonwoven manufacture was successfully conducted at SITRA, Coimbatore. Bulk nonwoven fabric samples prepared at SITRA, Coimbatore. Evaluation of eri silk nonwoven fabric's physical and mechanical properties completed. Sericin based recipe for application on eri silk nonwoven fabric for facemask application carried-out at L'Oreal research lab. Evaluation of facemask samples prepared from the above techniques in terms of hydration efficiency and other facial mask characteristics being conducted at L'Oreal research lab.
21	CED 7068	Modification of eri spinning preparatory machines for productivity and quality	Evaluation of present/existing coarse fillet opening machine for technical and productivity problems and ease of operation. Design of suitable Cocoon opening machine for Productivity, quality and ease of operation and easy maintenance. To transform Eri spinning activity from a low income, part time job, low productivity into high productive, higher remunerative, full time job for small time producers of yarn.	Aswatha Reddy	K.P.Shivakumar-CI Subhas V Naik-PC	2016-17	The design of Opening m/c required for Eri cocoon opening cum lap forming machine is conceived. Specifications and machinery drawings have been prepared. Fabrication of the Eri cocoon opening cum Lap forming machine will be taken up as a follow up programme subsequently
22	CYR 7069	Production of novel raw silk yarn by cocoon filament entanglement method during reeling	To develop a suitable attachment in reeling basin to make the cocoons entangle during the process of reeling. To study the characteristics of the novel yarn produced by cocoon filament entanglement method. To develop fabrics using the novel yarn produced by cocoon filament entanglement method and to study its characteristics.	G. Hariraj Dr.	Subhas. V. Naik-CI B. M. Mahadevaiah-CI Subhas V Naik-PC	2015-16	The machine for the production of novel yarn using cocoon entanglement system has been designed and fabricated and tested. Trials have been conducted and novel yarn has been produced and characterised. Using the yarns produced development of fabric, as weft has been done.
23	CYF 7070	Studies on silk carpets: Influence of structure on carpet properties	To develop silk carpets with varying structure using different silk yarns (mulberry, tasar and eri). To evaluate the tuft withdrawal force/ breaking strength of tuft, compression, abrasive wear, static/dynamic loading, flammability, colour fastness characteristics of carpets. To evaluate influence of carpet structure on its properties.	Kiran B Malali	Naveen V Padaki-CI K.K. Goswami-CI Sanat Kumar Pal-CI Subhas V Naik-PC	2016-17	Mulberry, Vanya and Eri spun silk yarns were successfully procured through NHDC, dyed with acid colours in three different colour shades. Carpet samples using three different hand knot structures were prepared and testing of these samples for various carpet parameters were also completed at IICT, Bhadohi. From the results, recommendations have been made which type of knot structure is suitable for a particular application. Industry shows very positive response to carpets produced from mulberry and vanya spun silks, particularly eri spun silk.
24	CYR 7071	Development of suitable cooking technology and characterization of raily cocoon	To analyze the shell contents of different varieties of tasar cocoons. To develop efficient cocoon cooking methods by targeting the shell contents using strong swelling agents and chemical treatments. To optimize the cooking process and develop cooking device, for both wet and dry reeling techniques. Standardization of reeling parameters. Characterization of reeled silk yarn.	Uday C Javali	Kiran B Malali-CI Naveen V Padaki-CI Subhas V Naik-PC	2016-17	Shell contents of different varieties of tasar cocoons have been analysed. Based on this, cooking process of raily tasar cocoons for both dry and wet reeling has been optimised. Reeling parameters of the same have been standardised and the silk yarn has been characterised. Reeling performance of the improved cooking technology is found to be significantly better than conventional cooking method.

25	CFC 7072	Development of sericin based finish for textile materials	Application of sericin based finish on different textile materials, i.e. polyester, cotton and silk. To study the effect of sericin finish on comfort and functional properties of the textile materials.	Brojeswari Das Dr.	M.A. Joseph-CI Subhas V Naik-CI&PC Deakin Univ. Rangam Rajkhowa-CI Christopher Hurren-CI Xungai Wang-CI	2018-19	i. SERICIN extracted from HTHP method has been successfully applied on to polyester, cotton, wool, silk and PC blended fabrics as finish. ii. Gluteraldehyde, Polysiloxane, Ethanol, BTCA and Alum pre/post treatments have been successful to improve the cross-linking of sericin finish and thus to enhance its durability. iii. Application of sericin finish shows enhanced water wickability, thus improved comfort properties, soft touch, better dyeability and better static charge property for wool fabric.
26	CFC 7073	Studies on photo degradation of silk fabrics	To study the photo degradation behavior of mulberry and Non-mulberry Indian silk fabrics. To understand and analyze the chemical and physical changes occurring in silk fabrics due to photo degradation. To develop a suitable finishing treatment for silk fabrics to improve photo degradation resistance of silk fabrics	S. A. Hipparagi	K. Jagannathan-CI G. Thimmareddy-CI Subhas V Naik-PC Deakin Univ. Lu Sun-CI Rangam Rajkhowa-CI	2018-19	Systematic classification of Indian Commercial silk fabrics on the basis U.V protection factor was done. UV degradation phenomena for raw silk degum silk, processed silk was established. Further degradation phenomena for mulberry and non-mulberry and behaviour of filament and spun silk was also established. 2. Phenomena of degradation for mulberry & non-mulberry silk was established at a different interval of time. 3. Protocol for finishing and dyeing to enhance the U.P.F. was developed using natural and synthetic products
27	CYF 7074	Electrospun silk fibroin nano-composite fibres for biomaterial applications	To develop silk nano-composite fibres using electrospinning technique, To understand the influence of sericin for nano-composite applications in terms of encapsulation stability and biodegradation, To study the influence of fibroin matrix and sericin reservoir system of encapsulation techniques on the release kinetics, and To evaluate the cytotoxicological properties of the developed silk nano-composite fibres.	Naveen V. Padaki Dr.	U. C. Javali-CI Prakash N. Bhat-CI Subhas V Naik-PC Deakin Univ. Alessandra Sutti-CI Xungai Wang-CI	2018-19	Silk nano-composite fibres (with fibroin, sericin & active drugs composition) have been successfully developed using electro-spinning technique. Developed optimized process parameters for preparation of Silk nanocomposite fibres (fibroin, sericin & active drugs) using electrospinning process. Studied the influence of fibroin and sericin matrix for drug stability of Curcuminoids, L-Dopa, Euganol & Gallic Acid towards nano-composite applications. Curcuminoids and L-Dopa herbal drugs are found to be stable with Silk Fibroin and Sericin matrix systems. Silk nanocomposite fibres with less than 200nm diameter have been observed in SEM. SEM images and FTIR analyses of silk fabric samples coated and electrospun nanocomposite fibres display uniform presence and dispersion of fibroin, sericin and drug molecules in the samples. FTIR Spectra confirms the presence of silk fibroin, sericin & drugs in both types of the samples prepared. Influence of fibroin and sericin matrix system of drug encapsulation on the release kinetics has been evaluated. Both Silk fabric coated & electrospun nanocomposite fibre with Curcuminoid Drug show drug release upto 24 hrs time duration. Silk electrospun nanocomposite fibre with L-Dopa Drug also show drug release upto 24 hrs time duration but not the silk fabric coated sample. Samples of developed silk nano-composite fibres for Cytotoxicological properties have been observed to be safe for use as transdermal patch in-terms of skin sensitization & irritation tests. Silk fibroin and sericin matrix system show promise for drug stability and nano-composite fibre applications. Through the findings of this project, it is now established that the silk nanocomposite fibres could be used as system for control release applications (such as transdermal patches).
28	CYR 7075	Studies on improving the cohesion characteristics of Multibivoltine raw silk / Tasar silk / Muga silk using sericin in reeling process.	Assessment of the suitability of the existing equipment / machinery for the proposed study. Assessment of the adhesive properties of Sericin extracted from bivoltine cocoon and Bivoltine raw silk. Optimization of process parameters for the application of sericin/gum onto multivoltine mulberry silk and non-mulberry silk. Assessment of performance of treated raw silk (Sericin treated /gum treated) in terms of strength and cohesion properties. Fabric preparation from the treated raw silk for assessment of its weaving performance & fabric quality.	Subhas V. Naik Dr.	Uday C. Javali-CI S. A. Hipparagi-CI M. A. Joseph-CI G. Hariraj-CI	2017-18	Cohesion of multibivoltine and Tasar raw silks can be improved significantly by coating the raw silk with sericin / gaur gum. 3 gpl of sericin /gaur gum coating gives better cohesion. Gaur gum is preferred due to its low cost. Gaur gum / sericin coated multibivoltine raw silk shows improved weaving performance. Thus the raw silk can be used as warp yarn
29	CYR 7076	Standardization of pre steaming techniques for improving the winding performance of raw silk skeins	Standardization of pre steaming for different types of raw silk, temperature and duration of steaming and its effect on winding, twisting performance of raw silk. Characterization of pre steamed raw silk in relation to surface modifications. To study the improvement in quality of pre steamed raw silk vis-à-vis raw silk without pre steaming, soaking and process economics will be studied for popularization.	G. Hariraj Dr.	Sangappa. N. Shillin-CI Subhas. V. Naik-CI	2016-17	It was concluded that 65°C temperature and 15 minute duration was found to be optimum condition for steaming. It was found that elongation characteristics of pre steamed silk was significantly higher than silk without pre steaming. Pre steamed bivoltine silk shown significant improvement in winding performance and elongation compared to silk wound without pre steaming.
30	CYR 7077	Grading of Tasar Raw Silk Yarn - Development of Methods and procedure	To develop suitable test methods for quality parameters of tasar silk yarns. To develop standard test procedures for assessment of tasar silk yarn quality. To develop standard photographs for evaluation of Defects in Tasar silk yarn. To develop suitable grading / classification norms for quality assessment.	Prakash N. Bhat	Kiran B. Malali-CI Naveen V Padaki-CI Goutam Mitra-CI Jayanta Ghose-CI B. Nanjagowda-CI N.S. Ghalot-CI Subhas V. Naik-PC CTR&TI ZMS Khan-CI	2018-19	Objective 1 : Done - Quality parameters needed for tests are identified and finalized. Objective 2 : Done -Test procedures for assessment of quality parameters has been developed. Objective 3 : Done - The standard photographs of evenness, neatness are not possible as the tasar yarn quality as of now needs too much improvement in these characters. Development of standard photographs for defects has been done. Objective 4 : Done - Classifications tables are prepared. The classification norms will be submitted to BIS for consideration to form standard test method.

31	CYR 7078	Studies on sericin dissolution characteristics	Designing of experiment and collection of cocoon samples Testing of reelability of cocoon lots and sericin dissolution character of cocoons shell for different seasons and taking photographs. Data compilation and analysis and Preparation and submission of final report.	M. M. Shirol	Aswatha Reddy-CI Kariyappa-CI Subhas V. Naik –PC CSRTI, Mysore V. Sivaprasad-PC	2017-18	Sericin dissolution characteristics significantly influences reelability of cocoons. Sericin dissolution at 5 minutes duration found to correlate well with reelability than at 10 min and 15 minutes duration. Reelability can be calculated using UV Spectrophotometer absorbance values by testing sericin dissolved liquor sample after boiling cocoon shells at 92°C for 5 mins. Grain sizes are larger in unfavourable (30°C, 90% RH) season cocoons compared to favourable season (27°C, 70% RH) cocoons. Larger the grain size, lower would be the reelability of the cocoons. SEM images indicate that low humidity and low temperature reared cocoons have better reelability.
32	CFW 7079	Characterisation & Evaluation of silk union (backed) Fabrics	To develop silk union (weft backed) loom finished woven fabrics for Ladies blouses and garments.	Jameela Khatoon	K. Jaganathan-CI Subhas.V.Naik-PC	2017-18	Information on the structural, mechanical, garment related and comfort properties of different varieties of woven silk backed fabrics has been generated and the means/method of improving them have been developed.
33	CFW 7080	Development of diversified silk knit wear products / garments using International quality Indian silk	Standardise the yarn quality parameters for silk knitting Optimisation of various parameters related to ply and twisting of raw silk. Deve. Of knitted fabrics / Garments from high quality BV raw silk produced from ARMunits for comm. Exploitation. Otimisation of process parameters for wet processing and finishing of knitted silk / silk union knits. To provide technical assistance in developing new products / garments from BV raw silk and creating designs for international market. Popularisation of mulberry knitted products.	K. Jaganathan	K..M.A. Kadhar-CI S.A. Hipparagi-CI K.P. Shivakumar-CI Jameela Khatoon-CI Subhas V. Naik-PC CO Shankar Kotrannavar-CI NIFT-TEA C. B. Senthil Kumar-CI&PC	2016-17	Single jersey, rib and interlock varieties of silk knitted fabrics have been produced with the help of Industry partners using international grade Indian raw silk of ARM units. Garments have been manufactured from them.
34	CYF 7081	Development and characterization of silk and silk blended mélange yarns	To develop silk and silk blended mélange yarn using different types of silk waste. Characterisation of different silk melange yarn produced	Sreenivasa	S.A.Hipparagi-CI Prakash N. Bhat-CI Jameela Khatoon-CI Brojeswari Das-CI Subhas V. Naik-PC	2018-19	☑ Successfully developed silk and silk blended mélange yarn using different types of silk waste. Melange spun silk yarn could be spun on worsted / cotton spinning system by blending the fibres either at draw frame stage or at carding stage. ☑ Melange silk yarns are relatively finer compared to the normal spun silk yarns. ☑ Silk and silk blended melange yarns have been characterized for spun silk yarn properties. ☑ Uniformity (U%) of melange yarns is on par with spun silk yarns but the imperfections (thick / thin places and neps) are high in comparison. ☑ Pink and blue melange yarns have distinct peppery appearance effect, indicating contrast colour blend as ideal for production of melange spun silk yarns.
35	CYR 7082	A study on the price behaviour of cocoons & raw Silk and its impact on the silk reeling sector	To study the variations in cocoon / imported raw silk arrivals, cocoon / raw silk prices & relationships between arrivals / prices of cocoon / raw silk. To study the relationship between quality & price of cocoons / raw silk. To study the impact of fluctuations of cocoon / raw silk prices on silk reeling units. To suggest measures to minimize the impact of price fluctuations on the working / profitability of silk reeling units.	C. R. Nagaraj	K.N. Mahesh-CI S.A. Hiremath-CI Subhas V. Naik-CI & PC	2017-18	The variation on cocoon / raw silk prices and the relationship between them have been studied using time series analysis. The relationship between cocoon quality parameters vs price and similarly between raw silk quality parameters vs price have been studied. The impact of price fluctuations on silk reeling units has been studied and some measeures have been suggested in reduce the impact on reeling units.
36	CYR 7083	Reelability studies on muga cocoon pre-treatment methods	Development of cocoon pre-treatment method using vacuum permeation and cocoon cooking parameters for muga cocoons to achieve better raw silk recovery and raw silk quality. Development of cocoon pre-treatment method (adopting vacuum permeation) by using different chemicals. To evaluate the techno economics of the cocoon cooking pre-treatment method developed.	Soni Vijaykumar Ramdas	A. K. Pal-CI Subhas V. Naik-PC	2018-19	This project have been conducted for two commercial crops each of Jethua & Katia for seven recipe excluding two controlled recipe & based on result of the total number of 36 trials, the following results have been concluded • Silk recovery % for Kotia crop is 5.56 % higher compared to Jethua crop. • Reelability % for Kotia crop is 3.76 % higher compared to Jethua crop. Average reelability of all the four crop is 44.13 %. • Silk recovery 44.73 % for control methods namely traditional Soda cooking and CMER&TI developed Muga Silkplus cooking is the same. • Silk recovery consistency observed in two crops each of Jathua & Kotia for method Pre-Steaming & Neutralization after cooking but results are not encouraging as : • avg. silk recovery for two Jethua crop is marginally 0.1 % & 0.15 % higher compared to controlled Muga Silkplus & Soda Cooking respectively. • avg. silk recovery for two Katia crop is 0.43 % less compared to controlled Muga Silkplus & 0.52 % higher compared Soda Cooking respectively. • Average of four crop data reveals that Silk recovery % for six recipe are lower ranging from -0.14 % to -1.94 % compared to control Muga Silk plus (44.73 %) & Soda cooking (44.73 %).

37	CYR 7084	Development of new type of yarn (void silk) in reeling and spinning processes and its characterization.	To develop new type raw silk yarn (Void raw silk) in reeling with PVA as core and to study the reeling and yarn quality characteristics. To produce new type spun silk yarn (Void spun silk) using PVA as core and to study the spinning and yarn quality characteristics. To develop fabrics using the new type silk (Void silk) yarns (both reeled / spun) and to study the fabric performance and characteristics.	G. Hariraj Dr.	M. M. Shirol-Cl Kiran B. Malali-Cl Subhas. V. Naik-PC	2018-19	<ul style="list-style-type: none"> New type raw silk yarn (Void raw silk) with PVA as core has been developed in Silk reeling process and characterized. New type spun silk yarn (Void spun silk) with PVA as core has been developed in Spun silk spinning process / Spun silk doubling process and characterized. The fabrics developed using void silk / void spun silk has been characterized. It has unique appearance on the surface due to removal of PVA yarns in degumming and dyeing process. The characteristics of void silk / void spun silk fabrics were found to be superior in terms of crimp, crease recovery, elongation, air permeability and drape characteristics. The different surface effect developed on the fabrics due to removal of PVA yarn earlier introduced in yarn production, has created curiosity among the consumers and exporters. The void silk fabrics have shown significantly better low stress mechanical characteristics compared to raw silk / spun silk fabrics. The thermal characteristics of void silk fabrics were significantly better compared to raw silk / spun silk fabrics. The industry felt that these fabrics can be marketed effectively and has lot of potential.
38	CFW 7085	Development of handloom silk sarees using spun silk produced from different types of silk wastes	To study the characteristics of spun silk yarn of different counts in comparison with that of filament silk To develop handloom silk sarees using spun silk either as warp or weft To study the characteristics of the handloom spun silk sarees produced in terms of comfort properties and drapability. To create a brand image for handloom spun silk sarees	KMA Kadhar	C.R. Nagaraj-Cl Subhas. V. Naik-PC	2018-19	<ul style="list-style-type: none"> Standardized the handloom weaving preparatory process for the spun silk besides optimizing the process condition for spun silk dyeing Reverse engineering through fabric geometry for the production of handloom spun silk saree is established. Butta Handloom silk sarees using finer count spun silk either as warp or weft Brocade Handloom silk sarees using finer count spun silk either as warp or weft Spun silk sarees have been characterized for the aesthetic value and comfort properties through subjective, objective and KAWABATA analysis.
39	CYS 7086	Development of miniature eri spinning plant for better productivity and quality for adoption in North Eastern Region of India	To develop a Techno-economically viable Eri spinning plant for Medium scale Eri yarn spinners To improve productivity/quality of Eri spun yarn To produce Eri spun yarn for diversified applications. To transform Eri spinning activity from a low income, part time job low productivity into high productive, higher remunerative, full time job for medium scale Eri spinners in the North Eastern Region of India	Aswatha Reddy	G. Hariraj-Cl K M.Abdul kadhar-Cl Subhas. V. Naik-Cl&PC	2019-20	The miniature Eri spinning machineries required for the production of 30-60 Nm Eri spun silk yarn @ 25 Kg per day has been finalized. CSTRl project team opine that the miniature Eri spinning machineries can be manufactured in the country as per CSTRl specifications and could be established by any states who desire to set up medium scale Eri spinning units. The states, who desire to popularize Eri spinning, could be provided with relevant information and technical know developed under the project for the production of Eri spun silk. The output of the project will be much useful to the states where small quantities of peduncle waste, Tasar waste, silk wastes are generated such as Orissa, Chhattisgarh etc. wherein value addition can be done by producing spun yarn using Miniature spinning plant. In the mean time as per the instructions of the central office, CSB North eastern state Meghalaya has agreed to popularize the technology and informed to provide required building and other facilities for the establishment of miniature eri spinning plant. Further under the project building layout has been prepared to install the machinery. Also infrastructural details have been worked out such as labour, water and power requirements for operation of Miniature Eri spinning plant. Detail financial analysis is made and project report is prepared, immediately technology can be transferred to the field on demand of the states.
40	CFC 7087	Systematic purification of mulberry silk sericin for topical skin applications.	Systematic purification of unhydrolyzed sericin of high molecular weight extracted (non chemical method) from mulberry silk cocoons & yarns for specific topical skin application. To characterize unhydrolyzed sericin for molecular weight, moisture content, ash content, heavy metal content. Structural characterization of unhydrolyzed sericin of high molecular weight using high end instruments.	M.A. Joseph	S.A. Hipparagi-Cl K. Jaganathan-Cl Subhas V Naik-PC SBRL Ravikumar G-Cl	2017-18	<ol style="list-style-type: none"> Developed technology for the complete removal of Lead (Pb) and Cadmium (Cd), 95 % removal of Chromium (Cr) and 85% removal of Copper (Cu) of copper from sericin Characterized unhydrolyzed/high molecular weight and hydrolysed sericin for its molecular weight, moisture content, ash content, heavy metal content, etc Structural characterization of unhydrolyzed/high molecular weight and hydrolysed sericin using FTIR
41	CYR 7088	Studies on cocoon cooking using high temperature and high pressure technology & also using chemicals for achieving better reeling performance and quality silk particularly from unfavourable season cocoons	Studies on Influence of High Temperature & High Pressure during Cocoon cooking on Reeling performance & quality of raw silk Exploring the possibility of improving the Reeling performance of the cocoons (particularly unfavourable season cocoons) by using suitable chemicals during cocoon cooking process and accordingly developing chemical recipe/formulation. Studies on the Techno-economics of above techniques. Standardizing the process parameters of cocoon cooking with High temperature and High Pressure technique.	Subhas V. Naik Dr.	Aswatha Reddy-Cl M.A. Joseph-Cl D.Ravikumar-Cl	2018-19	<ol style="list-style-type: none"> Results clearly indicate that Reeling performance and quality of the silk can be significantly improved by using chemicals/ Pressurized cooking technology particularly when the reability is moderate to poor. Pressurized cooking technology is recommended to the reelers who are having better facilities like Multiend reelers where Boiler, Reel permeation chambers etc are available whereas the chemicals are recommended for small scale reelers. The output of the study as anticipated resulted in effective methods/techniques for better cooking of cocoons particularly produced under unfavourable conditions. This will help the reelers to realise significantly better silk recovery (i.e lower renditta) achieve better quality of silk and productivity as compared to existing conventional cooking methods.

42	CYR 7089	Studies on correlation between sericin solubility, reelability and stripping force of tasar cocoon	To study Sericin solubility characteristics of tasar Daba, Rally and other commercial cocoons . To study Reelability percentage of cocoons To study the stripping force on Instron tensile tester of different cooking methods . To investigate the relation ship between Sericin dissolution and reelability Percentage of tasar Daba, Rally and other commercial cocoons . New swelling agents will be explored to improve upon sericin solubility percentage and reelability percentage of tasar cocoons to improve raw silk yield.	G. Thimmareddy Dr. Kariyappa	Prakash N. Bhat-CI Z.M.S. Khan-CI Subhas V. Naik-PC Ajit Kumar Sinha-PC	2019-20	Optimum cocoon cooking method (Technology) for maximum recovery of raw silk from cocoons is established for both Daba and rally cocoons Quality of Tasar raw silk has improved due to better tasar cocoon cooking Productivity per person will improve so that industry can become economically viable. The relationship between sericin dissolution, striping force and reelability has been established for existing chemicals used for tasar cocoon cooking and new chemicals.
43	CFW 7090	Studies on improving the crease recovery of soft silk fabrics by fabric geometry	To study the creases recovery of soft silk fabric produced in different fabric geometry. To Improve the crease recovery property of soft silk through the optimization of fabric geometry. To study the correlation between the fabric geometrical properties and crease recovery property.	Shambhulingappa H H	K.Jaganathan-CI Thimmareddy G-CI Sangappa Shillin-CI Subhas V.Naik-PC	2019-20	The information on the fabrics which gives optimum results will be provided to the industry which will aid the silk fabric manufacturers in producing better engineered / designed fabrics The garment manufacturers would be benefited by way of being empowered to make a better choice of fabrics for garment/Saree manufactures and the consumers will benefitted in terms of availability of a variety of fabric with improved properties and value of their money
44	CFC 7091	Development of silk yarn finishes and study of its effect on performance and properties of loom finished silk fabrics	To develop and optimize yarn finishes for loom finished silk fabrics To study the effect of yarn finish on weaving performance of silk fabrics To understand the effect of yarn finishing on silk fabric properties	Y.C. Radhalakshmi Dr.	M.A. Joseph-CI Sreenivasa-CI Jameela Khatoon-CI Brojeswari Das-CI Subhas V.Naik-PC	2020-21	The output of the project has introduced new varieties of hand loom fabrics with functional finishes. These new varieties require an additional process of treating the dyed yarn with chemicals by exhaust method followed by drying and curing. So the knowledge of chemicals and the technique of treating the yarn and processing need to be created.
45	CYF07001SI	Extraction of eri sericin and charcterization	To standardize a suitable technology to recover sericin from pressurized degumming liquor using eri cocoon shell. To characterize sericin of eri and mulberry and compare. Examining the suitability of eri sericin for various applications.	M.A. Joseph (till April 2020) Y.C. Radhalakshmi Dr.	Sreenivasa Abhilasha J.Ramappa	2020-21	Standardized a technology to recover pure sericin from pressurized degumming liquor using eri cocoon shell. Eri sericin is characterized and compared with mulberry sericin Suitability of eri sericin for cosmetic application has been examined
46	CYFO 7002SI	Identification & quantification of different types of silk by chemical method	To identify suitable chemicals and methods for identifying different silk fibres / material. To develop test procedures for assessment of blend proportions of different silk variety. To Standardise procedures for identification and quantification of different silk variety.	Prakash N. Bhat	Dr. Brojeswari Das Dr.M.A. Joseph	2019-20	One novel method of separation of mulberry and non-mulberry silk has been evolved by dissolving the mulberry silk by chemical method. By this new method, percentage of mulberry or non mulberry (Vanya) silk in the blended silk yarn can be estimated/found out. Identification and quantification only by chemical means is not possible to the full extent. Both Chemical and physical tests are needed for identification and quantification of different variety of silk.
47	CYR07003SI	Studies on reeling performance and quality characteristics of raw silk from male and female cocoons and its influence on fabric properties	To study the reeling performance of the segregated male and female cocoons separately for Bi-voltine hybrids and multi-voltine hybrids. To study the quality characteristics of raw silk produced from male and female Bi-voltine hybrids and multi-voltine hybrids cocoons separately. To develop fabrics using the raw silk produced from male and female Bi-voltine hybrids and multi-voltine cocoons separately. To development of a gadget to segregate the male and female cocoons based on weight of the cocoons will be taken up once the test results are found significant	M.G. Mahesh	Subhas V. Naik M.M.Shirol	2019-20	Male cocoons are significantly better than Female cocoons in terms of Raw silk yield and quality characteristics of raw silk. Superior grade and high performing raw silk can be produced from the Male cocoons and can be used for special purposes. To practically explore the advantages of Male cocoons it is very essential to develop a gadget for separation of Male/Female cocoons. The expected outcome of the project will be production of superior quality yarn and fabric with better properties can be made available in the market for particular end use.
48	CYR07004SI	Techno-economics of automatic silk reeling	To study the investment requirements for establishment of ARM units. To study the production status of ARM units. To study the economics of automatic reeling unit. To estimate the working capital requirements. To document the constraints faced by ARM reelers. To study the impact of automatic silk reeling segment on sericulture (demand pull for cocoons - quality & quantity), quality improvement of raw silk & reduction in imports.	Subhas V. Naik Dr.	K.M A Kadhar D.Ravikumar K.N. Mahesh	2019-20	1. Study clearly brought out the fact that Automatic Silk Reeling technology is Techno-economically highly viable and suitable for achieving better reeling performance and superior grade raw silk from Bivoltine cocoons under Indian conditions. 2. The adequate quantity of superior grade raw silk consistently can be produced from Automatic silk reeling units – which is the demand of the industry. 3. Based on the field data various costs involved and working capital required have been assessed and detailed scientific project report has been prepared for 400ends and 200 ends capacity Automatic Silk Reeling unit which will be quite useful for the industry, particularly for both existing ARM reelers and new entrepreneurs 4. Study indicate that installation of more number of Automatic silk reeling units shall be encouraged so that more quantity of superior grade raw silk is produced and hence country can achieve self-sufficiency and also plan for Export of raw silk.
49	CED07005MI	Development of an apparatus to estimate the reelability of cocoons	Study the chemistry behind the spectrophotometric analysis of cocoon reelability using sericine dissolution Study the sericin dissolved water by Nephelometric Turbidity Units (NTU) Development of an apparatus to estimate the reelability of the silkworm cocoons Development of an sample preparation unit Validation & optimization of apparatus and its output results	Sangappa N Shillin	Prakash Bhat & S.A.Hiremath 2 from CSRTI, Mysore S.M.Hukkeri, Manthira Moorthy	2020-21	Following components / equipments were developed. Reelability testing apparatus Integrated weighing system for cocoon shell & required water quantity display. Liquid dispensing unit RO Membrane based Demineralize water Unit Custom made thermostatic water bath

50	CFC07006MI	Studies on Tasar cocoon drying and cooking using CSTRI conveyor drier and pressurized cooking technology - Collaboration with CTRTI, Ranchi	<ol style="list-style-type: none"> 1. To Standardise temperature and time profile for drying of Tasar cocoons using CSTRI conveyor drying machine for achieving better productivity, raw silk recovery and quality silk. 2. To study the techno-economics of conveyor drying viz-a-viz present sun drying method. 3. To develop tasar cocoon cooking technology by using CSTRI vacuum permeation pretreatment and High temperature & High-pressure method for achieving better reeling performance, productivity and quality tasar silk. 4. To study the combined effect of certain chemicals and high temperature, High pressure method on tasar cocoon cooking. 5. To study the quality characteristic of Tasar raw silk reeled from conveyor dried cocoons. 	Kariyappa Dr.	Dr.Subhas V Naik - CI Kiran B Malali - CI Sreenivasa - CI Ravikumar D - CI Debasis Chattopadhyay	2021-22	<p>Developed Standardised temperature and time profile for drying of Tasar cocoons using CSTRI conveyor dryer for achieving better raw silk recovery and quality silk</p> <p>The techno-economics of conveyor drying viz-a-viz present sun drying method has been evolved.</p> <p>Tasar cocoon cooking technology has been developed using HT HP machine for dry reeling</p> <p>Tasar cocoon cooking technology has been developed using pressurised cooking machine treatment followed by soaking in chemical for wet reeling to get high productivity, raw silk recovery, good cohesion and quality silk</p> <p>Tasar cocoon cooking technology has been developed using vacuum permeation technique followed by cooking and soaking in chemicals for wet reeling to get high productivity, raw silk recovery, good cohesion and quality silk</p> <p>From the project 525 grams per 4 hr production has been achieved By use of new cooking methodology highest raw silk yield 78.27%, tenacity 2.72-3.5 elongation 25-30% and cohesion 25-28 has been achieved.</p>
51	CFW 07007SI	Development of woven and knitted products using silk and silk blended Melange yarns.	<ol style="list-style-type: none"> 1. To develop woven and knitted fabrics and products using silk and silk blended Melange yarns. 2. To develop quality assessment method for Melange yarn and fabrics, further evaluate the difference in Melange effect between yarn formed by regular fibre dyeing-spinning process and the fibre blended yarn dyed post spinning. 3. To develop care instructions for silk Melange fabrics and apparels, as special effect introduced might affect the properties in yarn and fabrics. 4. To evaluate the functional and aesthetic properties of the woven and knitted fabrics prepared with these melange yarns. 5. To work-out the techno-economics and popularize the silk and silk melange yarns, fabrics and products in prominent silk clusters. 	Sreenivasa	Naveen V Padaki	2021-22	<p>Woven & knitted fabrics and diversified products developed with silk and silk blended mélange yarns.</p> <p>Quality characterization method available for of mélange yarns</p> <p>Care instructions developed for silk mélange fabrics and products.</p> <p>Silk mélange technology popularized and Commercialization through NRDC.</p>
52	CED 07008SI	Development of commercial model Bulky Raw Silk Reeling machine (Web silk reeling technology) for the production of bulky yarns and fabrics	<ol style="list-style-type: none"> 1. To develop a commercial model bulky raw silk production machine so that 1.5 Kg bulky silk produced per basin using slightly inferior quality cocoons 2. To study the working performance and economics of the developed commercial model bulky raw silk production machine 3. To develop fabrics using bulky raw silk production machine and study its performance and acceptability 4. To organize demonstration of technology and products to the stake holders 	G. Hariraj Dr. (Retired on Aug 2020) K M A Kadhar	M.R.Itagi Dr. Subas V.Naik	2022-23	<p>New machine to produce special purpose yarn would be made available</p> <p>Use of silk in non-textile application can be explored particularly in Defence application</p>
53	CFW 07009SI	Development and characterization of wrinkle resistant and high drape soft silk fabrics	<ol style="list-style-type: none"> 1. To standardize the concentration of chemical, temperature and duration of chemical treatment for soft silk fabrics to impart wrinkle resistant and high drape. 2. To characterize the fabrics based on Kawabata analysis 3. To study the economics of the process. 4. To develop variety of fabrics and study the consumer preference 	G. Hariraj Dr. (Retired on Aug 2020) K M A Kadhar	K.P.Shivakumar Dr. Subas V.Naik	2021-22	<p>Optimized the process conditions to maximize the desired functional properties of the fabric.</p> <p>The KAWABATA analysis revealed that the Primary Hand Values (PHV) for the women thin dress material are better than that of regular silk fabrics.</p> <p>The economics of the process have been documented. It is technically feasible and economically viable.</p> <p>The consumer preference was assessed using "Association rules mining" algorithms and results are very encouraging.</p>
54	CYF 07010MI	Grading of Muga silk yarn - Development of method and procedures - Collaboration with Lahdoigarh	<ol style="list-style-type: none"> 1. To study the required quality parameters of muga silk yarns for consideration of test method 2. To develop standard test procedures for assessment of muga silk yarn quality. 3. To develop standard photographs for evaluation of defects (only for reference) 4. To develop suitable grading / classification norms for quality assessment. 	Prakash N. Bhat	Ravikumar.D Manjunath R.N.-CMERTI	2021-22	<p>Quality parameters needed for tests are identified and finalized.</p> <p>Test procedures for assessment of quality parameters has been developed.</p> <p>Instrument development for inspection of defects is in final stage. Photographs will be captured and standards will be developed.</p>
55	CYF 07011SI	New methods of recycling of discarded silk materials / waste for sustainability.	<ol style="list-style-type: none"> 1. To develop mill spun yarns from pre and post consumer silk waste and characterize them. 2. To prepare other new products like silk waddings and silk powder from left over fibres and explore their applications. 3. To study the compostability of unusablesilk waste and to estimate its nutritional value 	Nivedita S. Dr.	Dr.Y.C.Radhalakshmi Kiran B Malali S.A. Hipparagi (Retired in May 21) M.A. Moon (Retired in Feb 20)	2021-22	<ol style="list-style-type: none"> 1. Mill spun yarns were developed from discarded silk material waste and characterized. 2. New products like silk wadding and silk powder were prepared from unspinnablefibres and some of their applications were tried out. 4. Biodegradability & compostability studies were completed and nutritional value determined.

56	CYR 07012SI	Influence of pre treatment for cocoon cooking and cocoon cooking condition on reeling performance and raw silk quality characteristics	1. To study the influence of vacuum permeation treatment (in isolation) on reeling performance and quality characteristics. 2. To study the influence of conveyor cooking (without vacuum permeation treatment) on reeling performance and quality characteristics of raw silk 3. To study the combined effect of vacuum permeation treatment and conveyor cooking treatment on reeling performance and quality characteristics of raw silk 4. To conduct techno-economic analysis of the different treatments.	Subhas V. Naik Dr.	Aswath Reddy K.P. Shivakumar	2021-22	1. Better Reeling performance of the cocoons in terms of renditta, Silk waste %, Pelade weight, thread breaks, yarn tension using vacuum permeation treatment followed by conveyor cooking can be achieved by Automatic silk reeler as compared to vacuum permeation treatment (in isolation) and Conveyor cooking (In isolation). 2. Better quality characteristics of raw silk reeled out of the cooking treatment using combination of vacuum permeation and conveyor cooking treatment as compared to the vacuum permeation treatment (in isolation) and Conveyor cooking (In isolation). 3. Superior grade 4A quality silk can be produced consistently using of vacuum permeation and conveyor cooking treatment as compared to the vacuum permeation treatment (in isolation) and Conveyor cooking (In isolation).
57	CED07013 MI	Development of Sericin/Polysaccharide encapsulated fertiliser for crop management and growth Collaboration with TERI & CSRTI	1. Development of sericin / polysaccharide encapsulating matrices for fertilizer (a) Microwave assisted synthesis of (Starch/Sericin) grafted acrylic acid-co-acrylamide will be the encapsulating matrix.(b) Microwave assisted synthesis of (Alginate/sericin) grafted acrylamide will also be an encapsulating matrix. Effect of adding montmorillonite will also be examined.(b)Both the above materials will be synthesized and characterized by FTIR and elemental analysis will be carried out by CHNO analysis. 2. Study the effect on plant growth by incorporating/mixing sericin along with fertilizers. • Raw materials & Instruments have been procured Microwave assisted synthesis of sericin grafted acrylic acid-co- acrylamide has been performed & precipitation method was optimized. • The kinetic parameters such as reaction time, temperature, initiators concentration for both initiators & Crosslinker concentration for grafting and crosslinking procedures were optimized. Optimization of monomer concentration for Acrylamide monomer was initiated	M.A. Joseph Dr. (Retired) Sreenivasa	Dr. Sailaja-PI Ms.Abhilasha Dr. C.M. Babu -CI(Mysore) H.H. Ninga shetty-CI(TERI)	2021-22	Microwave Reaction chamber was fabricated for carrying out the reactions. Microwave assisted synthesis of (Starch/Sericin) grafted acrylic acid-co-acrylamide and sodium alginate/sericin grafted acrylamide with MMT was performed. Given below kinetic parameters used in the reaction were optimized: ●Reaction time ●Temperature ●Initiators concentration ●Crosslinker concentration ●Sericin concentration ●Monomer concentration (Acrylamide & Acrylic acid) Prepared matrix was used for encapsulating NPK fertilizer Encapsulation efficiency, NPK release and water absorbing capacity of the synthesised beads were calculated. Bulk production of NPK encapsulated beads for Pot Studies was completed and Pot studies are going on at CSRTI, Mysuru The results from the first crop study reveals that the synthesised beads have good water holding capacity and show slow release of fertiliser
58	CFW 07014MI	Development of 3D woven silk Fabrics and Their suitable applications - Collaboration with Lahdoigarh	1. Retrofitting of the existing 2D weaving loom suitably for producing industrial scale 3D woven fabrics. 2. To develop 3D silk fabrics with orthogonal and Multilayer weave architectures. 3. To characterize the developed 3D fabrics to assess their suitability for luxurious executive wear and upholstery applications	Shambhulingappa H H	Dr.R.N.Manjunath-CI CMER&TI Lahdoigarh Entended from May, 22 to Nov, 22 (With JRF)	2022-23	1. Availability of high density silk fabrics for technical applications & aesthetic applications like suiting fabrics, elegant winter wears and luxurious upholstery etc 2. Product diversification by engineering silk fabrics to required end uses and increased value addition particularly for low cost silken materials like spun yarns etc when used for weaving 3D fabrics. 3. The technique of 3D weaving is proposed to be made available in an easily adoptable format on current 2D weaving machines which can thereby, improve the prospects and income for weaver's community 4. The introduction and exploration of 3D fabrics can Possibly increase the Indian export potential of silken materials
59	BPC 07015CN	Development of Mulberry sericin powder for nutraceutical applications- Collaboration with CFTRI, Mysore	1. To prepare low molecular weight purified sericin suitable for nutraceutical application 2. To study the physical and chemical characteristics of prepared sericin powders as per nutraceutical standards. 3. To scale up the hydrolysis and purification process from lab scale to pilot scale 4. To develop certain nutraceutical products enriched with sericin, as per the industrial standards	Abhilasha	Dr.Y.C.Radhalakshmi Dr. Yeruva Thirupathaiah Dr. Sridevi Annapurna Singh Entended from Sep, 22 to Mar, 23	2022-23	Sericin protein was found to be of 91% purity. Amino acid profiling of sericin shows high serine (~ 30%) and glycine (~10%) content. Sericin shows ~80% in vitro protein digestibility that means sericin is digestible Lab scale hydrolysis using alkaline proteases was successful and same was compared with soya protein as reference Sericin rich bread, cookies, chicken sausage, soup powder and sericin jellies were developed by optimization of sericin % and characterization of the food proximate analysis and sensory studies of the products was also carried out. Cytotoxicity study shows that sericin is non toxic.

60	CYF 07016SI	Development and validation of protocol for computerized zari testing	<ol style="list-style-type: none"> 1. To study the characteristics of commercial zari threads in terms of content and purity 2. To calibrate the XRF-ED zari testing machine with Data of Gravimetric analysis 3. To develop the protocol using statistical to determine the zari content values & its validation 4. To recommend zari testing / grading standards 	KMA Kadhar	K.Raghu M.M.Shirol Extended from Mar, 22 to Sep, 22	2021-22	<p>The fine zari samples collected from the industry and analyzed using the gravimetric analysis can be used as standards to calibrate the Computerized zari testing machine so as to get the accurate metal content value. Moreover, the silk content of the fine zari value can be estimated through algorithm using the python programming. Thus, the computerized zari testing protocol developed under this project shall pave way to test the zari thread either in Bobbin or Saree form, which is a non-destructive analysis, so as to get the content value of the constituent of fine zari thread, used in the production of high value brocade silk saree, at par with the gravimetric analysis within 2-3 mins in the computerized zari testing instrument with the help of KNN algorithm using the Artificial Intelligence technique.</p> <p>The research project findings in unequivocal terms recommend the popularization of the Computerized zari testing and grading so as to protect the interest of the manufacturers who uses the genuine high quality fine zari thread to weave the silk saree that should fetch reasonable remunerative price.</p>
61	BPC 07017EF	Developing novel applications from silk fibres and silk protein DBT Funded project Total 89.99 (CSTRI share 37.55)	<ol style="list-style-type: none"> 1. Developing antimicrobial and UV resistant silk fibres / yarns 2. Development of silk sericin based edible coating material 	Naveen V. Padaki Dr.	Abilasha – CI Subhas V. Naik Dr. (Retd on 31.07.22) (With JRF)	2023-24	
62	CYS 07018SI	Development of different types of blended yarns and comfort characterization of the blended fabrics	<ul style="list-style-type: none"> • To study the impact of blending on comfort properties of Eri silk/Linen and Tasar silk/Linen blended fabrics. • Optimization of the structural and blending parameters of Eri silk/Linen and Tasar silk/Linen blended fabrics for specific end uses. • Other possible combinations such as eri silk/cotton, eri silk/polyester/linen, tasar silk/polyester/linen, tasar silk/cotton and eri silk/modal/linen blended yarns / fabrics will developed for product development purpose. 	Brojeswari Das Dr.	Sreenivasa – CI (With JRF) Extended from Mar, 22 to Nov, 22	2022-23	<ol style="list-style-type: none"> 1.Linen rich linen/silk blended yarn can be successfully produced in wet flax spinning system. 2.Silk rich linen/silk blended yarn can be successfully produced in wet flax spinning system. 3.As per the Kawabata analysis, fabrics developed with Silk/linen blended yarns in wet, using silk filature warp can be used very well for niche application including women's dress for winter and as well for men's shirt. 4.Fabrics developed with Silk/linen blended yarns in wet and linen warp can be used very well as summer wear for men, women and child wear.
63	CFC 07019SI	Standardisation of process to improve Fastness properties of Dyed silk	<ul style="list-style-type: none"> • To study the characteristics of predominant colours used in dyeing of different clusters of silk handloom industry • To improve fastness of those selected predominant colours by: <ul style="list-style-type: none"> • Alternative class of dyes (Reactive dye) • Dye fixing agents • To standardise the methodology to get improved fastness for the selected predominant colors • To take mass trials in the field to optimize and fine tuning of the procedure 	Abhilasha	K.M.A. Kadhar-CI Dr Y. C. Radhalakshmi-CI M. M. Shirol-CI	2022-23	<p>Results from the survey of the three clusters shows the practice of dyeing followed in three major clusters are different. The whole degumming and dyeing procedure of the cluster is studied in depth during the survey to understand the fallbacks.</p> <p>Dyed samples collected from the clusters when tested for colour fastness properties shows that some predominantly used colours in the cluster show poor colour fastness. The poor colour fastness for those developed colours is due to mixing of different class of dyes together to prepare that particular shade and also not following proper procedure and recipe for dyeing.</p> <p>In the experimentation four different classes of dyes and three dye fixing agents were taken. From the results it was concluded that not only the use of alternate class of dyes like reactive and multifunctional can improve the colour fastness but the slight modification in the procedure followed by the dyers in cluster can also enhance the colour depth and fastness rating.</p> <p>Application of dye fixing agents after dyeing also improves the colour fastness of the dyed silk material. The fine tuning in the procedure was done in the cluster with the inputs from the dyers.</p>
64	CFW 07020SI	Studies on influence of raw silk denier on fabric properties and its Economics	<ul style="list-style-type: none"> • Production of 20/22, 26/28 and 40/44 denier raw silk and studying the productivity and raw silk quality characteristics. • Weaving of fabric with raw silk of 20/22 denier and its ply. 40/44 denier and its ply 26/28 and its ply in warp and weft (depending on the variety/structure of fabrics) in different combination and evaluating fabric properties • Exploring the possibility of developing new products from the coarse denier yarns for diversified usage/application. • Techno-economic analysis of reeling and weaving processes vis-à-vis properties of fabrics made out of different deniers. 	Subhas V. Naik Dr.	Aswatha Reddy – CI M.G.Mahesh – CI Dr.Nivedita - CI	2022-23	<p>Most of the important mechanical and comfort properties and low stress mechanical properties of the fabrics in the case of selected coarse deniers are almost on par with those in the case of fabric with existing fine denier silk selected for the study.</p> <p>The economy of silk reelers and weavers will improve besides reduction in labour.</p> <p>This has given alternate concept without affecting the quality of fabric particularly when the industry facing unfavourable conditions/market fluctuation to achieve better profits.</p> <p>Soft silk, Taffeta and Crepe fabrics with new construction particulars have been also developed along with existing ones.</p>

65	CFC 07021SI	Development of standard procedure for dyeing of raw (Kora) silk yarn	<ul style="list-style-type: none"> To study the present process and explore possibility of developing standardized preparatory processes for dyeing of mulberry raw (kora) silk yarn To study the present process and explore possibility of developing standardized dyeing method and post-treatments for mulberry raw (kora) silk yarn To study the performance of dyed kora silk products (present process and newly developed method) in terms of dye uptake, colour difference and fastness properties along with process economics. 	Naveen V. Padaki Dr.	Sreenivasa – CI Mukul Sen Gupta – CI Dr.Sargunamani - CI	2023-24	<p>Present process of kora (raw) silk dyeing in different clusters has been studied. Standard processing conditions not maintained during dyeing of raw (kora) silk yarn due to weight loss issues and also dyers have got used to wrong selection of dyes.</p> <p>pH is observed to have little effect on gum loss whereas higher temperature treatment has direct effect on the gum loss in raw silk yarn. pH range of 4.5 to 9.5 under 60°C is preferred for processing raw (kora) silk yarns.</p> <p>Pre-wetting for 30 minutes with wetting agent and continuing dyeing in the same bath is suggested as standardized preparatory processes for dyeing of mulberry raw (kora) silk yarn.</p> <p>Acid dyes and Metal-complex dyes does not impart sufficient fastness to the raw (kora) silk yarn even at 60°C.</p> <p>Reactive dyes and Vat dyes are preferred dyes for dyeing raw (kora) silk yarn at 60°C having a high fastness ratings with minimal gum weight loss (below 5%) and strength loss.</p> <p>Steaming the dyed yarn as Post-treatment after fixing treatment/oxidation and soaping / washing process is recommended to enhance the fastness by another notch.</p>
66	CFW 07023SI	Studies on thermophysiological properties of Plain, Twill & Satin woven Tasar silk fabrics	<p>To construct different variety of Tasar silk fabrics, plain, twill and satin with different GSM, Twist and cover factor</p> <p>To study and analyze the Physical, Thermal, Thermo physiological, Comfort properties of the developed fabrics and the relation between the fabric structures.</p> <p>To find out optimum construction particulars for thermo physiological and comfort properties of Tasar fabrics for different applications viz. shirting, Suitings, made-ups, garments etc.</p> <p>To popularize and commercialize the developed technology.</p>	Thimma Reddy	H.H. Shambulingappa-CI (With JRF)	2023-24	<p>Developed Plain, Twill, Satin Tasar fabrics as per the project plan.</p> <p>Assessment of the fabrics for physical properties and physiological, comfort properties of the fabric were carried out.</p> <p>Product development such as Tassar shirtings, Suitings, Kids wear, Ladies wear have been developed.</p> <p>Optimum construction particulars between physical properties and comfort properties have been studied and fabrics suitable for winter and summer have been identified.</p>
67	CYF 07024 SI	Development of test methods & procedures by adopting Subjective (Human visual judgment) & Objective (Equipment evaluation) non destructive methods for Identification of loom origin of silk sarees.	<ol style="list-style-type: none"> To study & list the parameters involved for evaluation of silk sarees woven on handlooms & power looms and distinguish its differences. To evolve testing procedure for Handloom Test for Silk Sarees/items covered under Handloom Reservation Act 1985 on both objective and subjective methods apart from validating the equipment through awareness programs / field trials To develop non destructive testing method suitable for loom finished handloom /power-loom silk sarees devoid of objections from consumers/Retailers & Industry To establish the testing procedure for identifying the loom origin/source of silk saree as an in-house testing method of CSTR which is already in vogue/permitted under BIS/ASTM 	Mathiazhagan P.	Prakash Bhat (With JRF)	2023-24	<p>A Non- Destructive and user-friendly testing method is established which is significant and suitable for consumers and retailers.</p> <p>Developed a hardware-based testing method supported by software developed vis-a-vis statistically arrived histogram indicating the origin of loom with a mean-variance value. Field tested as it fulfils one of the objectives of Non-Destructive testing method.</p> <p>The software developed using Artificial Intelligence (AI) and Machine Learning (ML) based tools is interfaced with a high definition scanner has successfully proved to identify silk sarees origin of the loom on Handloom and power loom which assessed to be more user friendly, short time test done is being compiled as final conclusion.</p>
68	CED 07026 SI	Design and development of automatic digital tasar cocoon counting machine.	<ol style="list-style-type: none"> Design and development of automatic tasar cocoon counting cum sorting machine . Evaluation and popularisation of the developed Tasar cocoon counting cum sorting machine in the field and fine tuning. 	Kariyappa Dr.	Subhas V. Naik Dr. (Retd on 31.07.22) Sangappa Shillini (Retd. On 31.05.23)	2022-23	<p>Design of the machine has been completed.</p> <p>Tender for machine fabrication has been called and financial bid is opened and proposal to procure is kept in abeyance.</p>
69	MOE 07027SI	Evaluation & Popularisation of Technologies in Post Cocoon Sector.	<p>Component-I : Validation of reelability estimation apparatus</p> <p>Component-II : Validation of Grading of Tasar Raw Silk Yarn</p> <p>Component-III : Popularization of yarn finishes for handloom units</p> <p>Component-IV : Popularisation of high temperature and high pressure technology (HTHP) for cocoon cooking</p>	Y.C. Radhalakshmi Dr.	Prakash Bhat – CO-PI Saurabh Majumdar – CO-PI Tripurary Choudhary– CO-PI S.A.Hiremath– CO-PI	2023-24	All the Tehcnologies are validated in the field
70	CFW07029CN	Development of Standard Norms for the generation of silk and zari waste during preparatory and silk weaving process in Kanchipuram cluster	<ol style="list-style-type: none"> To study the existing norms of waste generation in various processes involved in production of different types of silk sarees. To revise new norms of waste generation, in various processes involved for production of different types of silk sarees. 	K Raghu	KMA Kadhar Dr.Sargunamani Dr.G R Halagundegowda (With PA)	2023-24	<p>Completed survey for collection of data on silk waste and zari waste generated during weaving preparatory and weaving process from seven different clusters of Tamil Nadu.</p> <p>Statistical analysis of the data from all the cluster was performed to identify the optimal waste percentage that can be permitted. Accordingly, norms for silk and zari wastage during weaving preparatory and weaving process was arrived at.</p>