1. INTRODUCTION

Silk is a luxurious natural fibre also known as queen of textiles. Silk is a generic term used for protein fibres secreted by several species of insects that belong to the order Lepidoptra. Silk worm secrets silk fibres to build protective shell known as cocoons during end of larval stage in their life cycle in which the larva is metamorphosed in to pupal form. Silk fibre has been a precious trade commodity for more than 4000 years. The ancient route for transporting silk consignment from China to Mediterranean countries come to be known as the "The Silk Route".

Tasar silk is copperish in color, coarse in nature and is mainly used for furnishing and interiors. Tasar silk is secreted by tropical tasar silk worm Antherea mylitta D which thrives on Asan (T. tomentosa) and Arjun (T. Arjuna). In India tasar silk worm rearing for production of cocoons has been a traditional craft of tribal people inhibiting the stage of Chhattisgarh, Jharkhand, Bihar, Madhya Pradesh, Odisha, Andhra Pradesh, Maharashtra, and West Bengal. Nature grown cocoons are collected on large scale in some of the tasar producing areas like Chhattisgarh, Odisha and Jharkhand

Among all the silk Mulberry silk alone contributes a larger proportion (79%) , while production of other natural silk together contributes to 21% comprising of Eri silk (13%), tasar silk (7%) and Munga Silk (1%).

Hence the tasar silk reeling activity is a post cocoon technology which gives good remuneration to a reeler in his dwelling places. This requires a special technical training to reeler in which he learns all the important aspect of reeling technology like sorting of cocoons, cocoon stifling , cocoon storage, grading of cocoons , tasar cocoon cooking, tasar reeling, tasar re-reeling , tasar spinning and tasar cocoon waste management.

2. GENERAL INFORMATION AND COURSE STRUCTURE

1. Module Name:	Sericulturist- Tasar Silk Spinner
2. Sector	Agriculture
3. Course Code	CG/AGR/SER003
4. Entry qualification	Preferably 5th standard and Minimum 14 years of age.
5. Terminal competency	The trainee after training will be in position to carry out all the post cocoon activity
6. Course duration	200 hours
7. Preface	The successful candidate would be able to carry out activity starting from selection of cocoons, cocoon stifling, Cocoon Storage, cocoon grading, cocoon cooking, tasar spinning, Re-reeling, and tasar cocoon waste Management.

Distribution of training on hourly basis

Sr. No	Broad Practical components to be covered	Duration in hours
01	Basic Knowledge	16 Hr
02	Sorting activity	10 Hr
03	Stifling of cocoon activity	18 Hr
04	Selection before cooking activity	6 Hr
05	Cocoon cooking activity	12 Hr
06	Spinning and Re-reeling activity	116 Hr
07	Waste Management activity	10 Hr
08	Packaging	6 Hr
08	Storing activity	6 Hr

3. JOB ROLE

Brief description of job role:

The process of silk filament extraction from the softened / cooked cocoons which is called reeling, is so far limited to dry or semi dry method as cooked cocoons are first soaked in a ash bed to remove excess water and then taken for reeling. The tasar silk reeling was anciently done by the women called thigh reeling. It is a traditional process mostly practised by traditional tasar weaver. One lady from weaver's family in a crossed leg position draw individual filament from 5-7 cocoons and rub on her thigh to form the yarn of targeted fineness and wind on to a bamboo made natwa. This process of reeling is preceded by soda cooking of cocoons and imparts no twist to the yarn. The yarn so formed lack strength and cohesive power and cannot be used as warp. Moreover, the productivity is low to earn reasonable income. Lastly the process is not hygienic as concerned mostly suffers from skin disease and should not be encouraged. The odd looking scenario of a woman doing on her thigh is also not well taken in the society.

The disadvantages of natwa reeling leads to the development of many mechanical devices over the years of which motorized reeling cum twisting machine is most suitable considering the prevailing condition in the rural area. The productivity also enhances significantly over the natwa reeling process. For using cocoon reeling waste, inferior quality cocoons and pierced cocoons another machine is developed called spinning machine.

In this NSQF Course, the trainee will learn and adopt all the reeling and spinning activity on different machines and earn reasonable profit at home along with other household work.

4. GENERAL TRAINING PLAN, ASSESSEMENT

& CERTIFICATE

General Training Plan:

The training module is designed in such a way that a low level literate person (5th pass) or even illiterate can undergo training and learn all theoretical and practical aspects of it.

Assessor:
A competent assessor, not below in qualification and experience than the Trainer of the course, would be involved for assessing the learning capacity of the trained trainee.

Pass regulations:
Minimum passing mark for practical is 40%
Minimum passing marks for theory is 40%.

CERTIFICATE:

Successful persons will be awarded certificates issued by Chhattisgarh State Skill Development Authority.

5. LEARNING OUTCOME

The following are minimum broad learning outcome after completion of the tasar silk reeler course of 120 hours duration.

1. **General outcome:**
   The trainee will be in a position to understand the importance of different tasar post cocoon activities and their processes.
2. **Specific outcome:**
   The trainee will know all the major activities like preliminary sorting of cocoons, tasar cocoon stifling, tasar cocoon storage, cocoon grading, tasar cocoon cooking, tasar spinning, tasar re-reeling, and tasar cocoon waste management.

6. ASSESSABLE OUTCOMES WITH ASSESSMENT CRITERIA

1. The training shall be conducted as per the syllabus.
2. The training shall demonstrate the competency which is defined below in assessable outcome and assessment criteria.
3. The entire assessable outcomes are to be tested during formative assessment, observations and viva –voice.

GENERAL ASSASSABLE OUTCOME

Assessable outcome	Assessment criteria
01	follow and maintain to achieve a safe working environment in line with occupational health and safety regulation and requirement and according to the site policy
02	Identify and take necessary precaution on fire and safety hazards and report according to site policy and procedure
03	Identify basic first aid and use them under different circumstances
04	Avoid waste and dispose waste as procedure

SPECIFIC ASSESSMENT OUTCOME:

Assessable outcome	Assessment Criteria
Preliminary sorting of cocoons	Selection criteria and norms, Physical and commercial characters of cocoon, Defective cocoon, Cocoon shape, size, compactness and uniformity for break less or less break reeling
Tasar cocoon stifling	Different stifling methods, Sun drying, Smoke stifling Hot air stifling
Cocoon Storage	Standard and optimum storage size, Storage capacity Storage climate, Precaution during storage
Grading of cocoons	Standard grading norms, Physical grading, Scientific grading
Tasar cocoon cooking	Different methods of tasar cooking, Open pan cooking technique, Permeation cooking techniques, Use of chemicals, Precaution during cocoon cooking
Tasar Spinning and Re-reeling	Different spinning machines and their working, Re-reeling
Silk packing	Methods of silk packing, Material for silk packing, Silk book making, Silk Storage

7. SYLLABUS CONTENT WITH TIME STRUCTURE FOR THE MODULE OF TASAR EGG PRODUCER

Duration: 200 hours Detailed Syllabus

PRACTICAL	THEORY	Duration (hrs)	
		Practical	Theory
	General Theory Qualities required for good reeler, good behaviour, patience, responsibility and self confidence, anticipation, reeling and spinning machine maintenance ability.	**0**	**8**
Cocoon characters	Different types of tasar cocoons including reared and nature grown cocoons.	**4**	**4**
	Post cocoon tasar silk technology operation	**0**	**8**
Sorting of cocoon	Cocoon characters in context to Daba, Sukinda and other eco races like Raily and Lariya in specific studies for male and female cocoon weight, shell weight and shell ratio percentage.	**8**	**4**
	Unit of measurement of cocoon which prevails in Chhattisgarh, Bihar, Jharkhand, Odisha and other tropical tasar producing state.	**0**	**8**
Tasar cocoon stifling	Importance of stifling, stifling period, stifling method including sun drying, smoked stifling and hot air stifling, merit and demerit of all drying process	**8**	**2**
Cocoon storage	Type of storage building, basic facilities of storage, size of storage building, storage equipment, storage capacity, precaution during storage.	**4**	**2**
Cocoon grading	Different cocoon grades and their parameters and their importance	**4**	**2**
Tasar cocoon cooking	Different methods of tasar cocoon cooking, their merit and demerit, tasar cocoon cooking equipments and their use.	**8**	**4**
Tasar cocoon Spinning	Preparation for spinning, different spinning machines and their specification, technology to produce better silk yarn, Re-reeling and hank making.	**100**	**16**
Packing	International silk packing norms and their materials	**4**	**2**
Total		**140**	**60**
Grand Total		**200**	

8. INFRASTRUCTURE

1 Instructor's/ trainer's Qualification	Degree in Science with 10 years of Sericultural working experience
2 Desirable Qualifications	Tasar silk reeling instructor must be trained from Central Silk Board national level training institute or from Department of Sericulture Chhattisgarh at least for six months
Lab/ Space Norms	2000 sft. area is required with a model grainage house
Power Norms	5 KW minimum
Tolls, equipments and machinery	As per Annexure 1

9. ASSESSMENT STANDARD

The trainer/assessor should ensure appropriate arrangements for assessment and appropriate resources are available for undertaking such assessment. The nature of special needs should be taken in to account while undertaking assessment.

In this work there is evidence of

1. Weight age in range of 60-75% to be allotted during assessment under following performance levels. For performance in this grade the candidate with occasional/ frequent guidance and showing due regard for grainage procedures and practices, has attained grainage skills which demonstrates reasonable standard set forth.

In this work there is evidence of:

- Demonstration of good graineur skills with different methods.
- Below 70% accuracy achieved while undertaking different skills demanded by the set standards.
- A fairly good level of neatness and consistency in handling controls.
- Occasional support in completing the job.

2. Weight age in range of 75-90% to be allotted during assessment under following performance levels. For this grade with little guidance and showing due regard for safety procedure and practices, has attained graineur skills which demonstrates reasonable standard set forth.

   In this work there is evidence of

- Good skill level in graineur skills in grainage with different methods.

- 70-80% accuracy achieved while undertaking different skills demanded by the set standards.
- A good level of neatness and consistency in handling controls.
- Little support in completing the job.

3. Weight age in range of above 90% to be allotted during assessment under following performance levels. For performance in this grade the candidate with minimal or no support in organization and execution and with due regard for grainage procedure and practices has attained seed producing skill which demonstrates reasonable standard set forth.

In this work there is evidence of:

- High skill levels in the use of seed producing skills in grainage with different methods.
- Above 80% accuracy achieved while undertaking different skills demanded by the set standards.
- A high level of neatness and consistency in handling controls.
- Minimal or no support in completing the job.

10. EXTERNAL ASSESSMENT

Sr.No	Assessable outcome	Assessment result
GENERIC		
01	Follow and maintain to achieve a safe working environment in line with occupational health and safety regulation and requirement and according to the site policy	3
02	Identify and take necessary precaution on fire and safety hazards and report according to site policy and procedure	5
03	Identify basic first aid and use them under different circumstances	4
04	Avoid waste and dispose waste as procedure	3
SPECIFIC		
05	Preliminary sorting of cocoons Selection criteria and norms Physical and commercial characters of cocoon Defective cocoon, Cocoon shape, size, compactness and uniformity for break less or less break reeling	5
06	Different stifling methods, Sun drying, Smoke stifling, Hot air stifling	7
07	Standard and optimum storage size, Storage capacity, Storage climate, Precaution during storage	3
08	Standard grading norms, Physical grading, Scientific grading	5
09	Different methods of tasar cooking, Open pan cooking technique, Permeation cooking techniques, Use of chemicals, Precaution during cocoon cooking	20
10	Different spinning machines and their working, Re-reeling and hank making	40
11	Methods of silk packing, Material for silk packing, Silk book making, Silk Storage	5
Total		**100**

Annexure- 1 Tool and equipments required for a batch of 30 trainees

S. No.	Item	Unit	Quantity
1	Reeling Machine	No.	30
2	Re-reeling Machine	No.	30
3	Measuring cylinder	No.	2
4	Soap & Soda	Kg.	08
5	H_2O_2	Liter	15
6	Cooking drum	No.	4
7	Plastic Mug	No.	5
8	Plastic Bucket	No.	5
9	Fire wood	Kg.	150
10	Cotton Thread	No.	10
11	Tasar cocoon	No.	75000
12	Plastic Tray	No.	30
13	Plastic Chair	No.	30
14	Mosquito net	Meter	10
15	Gunny cloth	Meter	10
16	Perforated spoon (Jhara)	No.	05
17	Sodium silicate	Kg	01
18	Sodium hydroxide	Kg	05
19	Sodium bicarbonate	Kg	02
20	Black cotton cloth	Meter	05
21	Tin box for yarn storage	No.	02