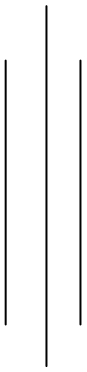
Curriculum Guide

for

Sericulture technical worker

(*STW-A short term curriculum*)



Council for technical education and vocational training

Curriculum development division

Sanothimi , Bhaltapur

2007

Job title: sericulture technical worker

Tasks:

1. **Develop concept of mulberry production**
2. **Propagate mulbery**
3. **Develop concept of sericulture**
4. **Rear young age silk worm**
5. **Rear adult age silk worm**
6. **Mount ripen silk worms**
7. **Handle cocoon**
8. **Market quality products**

Table of content

Introduction:

This competency based curriculum guide is designed to produce lower level technical workforce in the field of sericulture equipped with skills, knowledge and positive attitudes related to sericulture in order to meet the demand of such workforce in the country so as to contribute in the national streamline of poverty reduction in the kingdom of Nepal.

Aims

The main aim of this curricular program is to produce skilled workforce in the field of sericulture by providing training to school dropouts and unemployed youths and link them to employment opportunities. The aims of this guide are:-

- To produce lower level technical workforce in the area of sericulture including mulberry cultivation and production.
- To produce such technical workforce who will be able to be self-employed being an entrepreneur.

Objectives:

After the completion or this training program, the trainees will be able to:

- Develop concept of mulberry production
- Propagate mulberry
- Develop concept of sericulture
- Rear young age silk worm
- Rear adult age silk worm
- Mount ripen silk worms
- Handle cocoon
- Market quality products

Description:

This guide provides skills and knowledge necessary for sericulture technical worker. There will be both demonstration by trainers/instructors and opportunity by trainees to carry out the skills/tasks necessary for these level of technical workforce. Trainees will practice and learn skills by using typical tools, materials and equipment necessary for the program.

On successful completion of this training, the trainees will be able to develop concept of mulberry production, propagate mulberry, develop concept of sericulture, rear young age silk worm , rear adult age silk worm , mount ripen silk worms, handle cocoon, market quality products,, and communicate with others.

Course structure:

Tasks	Nature	Hours distribution		
		Practical	Theory	Total
1. Develop concept of mulberry production	P	4	16	20
2. Propagate mulbery	P	4	16	20
3. Develop concept of sericulture	P	2	8	10
4. Rear young age silk worm	P	4	16	20
5. Rear adult age silk worm	P	4	16	20
6. Mount ripen silk worms	P	5	20	25
7. Handle cocoon	P	5	20	25
8. Market quality products	P			
Total:		28	112	140

Duration:

The total duration of the program will be of 140 hours

Target group:

The target group for this training will be all the literate individuals interested in this area of training. Priority will be given to females, Dalits, Janajatis, conflict affected people and the disables.

Group size:

The group size of this training program will be maximum of 20.

Target location:

The target location of this training program will be all over Nepal.

Medium of Instruction:

The medium of instruction for this training program will be Nepali or English or both.

Pattern of attendance:

The trainees should have 80% attendance in theory classes and 90% in Practical (Performance) to be eligible for internal assessment and final examinations.

Focus of the program:

This is a competency based program. This program emphasizes on competent performance of the task specified in it. 80% time is allotted to the competencies and 20% to the related technical knowledge. So, the main focus will be on the performance of the specified competencies/tasks /skills included in this program guide.

Entry criteria:

Individuals who meet the following criteria will be allowed to enter in this curricular program:

- Be literate
- Minimum of 15 years of age
- Should pass entrance examination
- Preference will be given to female, Dalit, Janjati, Conflict affected people and the disables.

Follow up suggestion:

This is not a training program only for training sake. The ultimate success of this program will rest on the proficiency of the graduates of this training program in providing services in the community either by wage employment or by self-employment.

In other to assess the success of this program and collect feedbacks/inputs for the revision of the program, a schedule of follow up is suggested as follows:-

- First follow up: - Six months after the completion of the training program.
- Second follow up: - Six months after the completion of the first follow up.
- Follow up cycle: - In a cycle of one year after the completion of second follow up for five years.

Certificate requirement:

The related training institute will provide the certificate of “Sericulture technical worker” to those individuals who successfully complete all the tasks with their related technical knowledge specified in this guide.

Student Evaluation Details:

- Continuous evaluation of the trainees' performance is to be done by the related instructor/trainer to ensure the proficiency over each competency.
- Related technical knowledge learnt by the trainees will be evaluated through written or oral tests as per the nature of the content
- Trainees must secure minimum marks of 60% in an average of both theory and practical evaluations.
- There will be three internal assessments and one final evaluation.
- The entrance test will be conducted by the concerned training institute.

Trainers' Qualification:

- I.Sc. Ag or Equivalent in the related field / I.Sc. (Bio. Group) or equivalent with training & job experience in the related field/JT with 5 years experience in. the related field
- Good communicative & instructional skills.
- Experience in the related field.

Trainer – Trainees Ratio:

- 1:10 for practical classes
- Depends on the nature of subject matter and class room situation for theory classes.

Suggestion for instruction

Demonstrate task performance

- Demonstrate task performance in normal speed
- Demonstrate slowly with verbal description of each and every steps in the sequence of activity flow of the task performance using question and answer techniques
- Repeat the above step for the clarification on trainees demand if necessary.
- Perform fast demonstration of the task performance.

Provide trainees the opportunity to practice the task performance demonstrated.

- Provide trainees to have guided practice:- create environment for practicing the demonstrated task performance and guide the trainees in each and every step of task performance
- Provide trainees the opportunity to repeat & re-repeat as per the need to be proficient on the given task performance
- Switch to another task demonstration if and only if the trainees developed proficiency in the given task performance

Evaluation performance of the trainees/ student

- perform task analysis
- Develop a detail task performance check list
- Perform continuous performance evaluation of the trainees / students by applying the performance check list.

Task list:

- Develop concept of mulbery production
- Propagate mulbery
- Develop concept of sericulture
- Rear young age silk worms
- Rear adult age silk worms
- Mount ripen silk worms
- Handle cocoon
- Market quality products

Develop concept of mulberry production:

Task steps	Terminal performance objectives	Related technical knowledge
1. Collect technical terminologies related to mulberry production 2. Define the technical terminologies related to mulberry production 3. Develop technical concept of the followings: • Managing land for sericulture farming • Propagation of mulbery • Managing tools/ materials/ equipment • Establishing mulbery farm • Preparing compost • Cultural operations • Protecting mulberry plant against insect/ pest/ disease/ weeds • Mixed intercropping • Utilizing mulbery by-products • Marketing quality mulbery products • Safety precautions and recording 4. Keep records	***Condition(given):*** List of technical terminologies related to mulberry production, necessary tools, materials, equipment, and supplies ***Task (what?):*** Develop concept of mulberry production ***Standard (how well?):*** • Concept of mulberry production well developed as specified in the task steps • Secured at least 60% score in knowledge tests	Concept of mulberry production : • Listing technical terminologies related to mulberry production • Definitions of the technical terminologies related to mulberry production • Concept - what, why, where, when, and how? - of the followings: ▪ Managing land for sericulture farming ▪ Propagation of mulbery ▪ Managing tools/ materials/ equipment ▪ Establishing mulbery farm ▪ Preparing compost ▪ Cultural operations ▪ Protecting mulberry plant against insect/ pest/ disease/ weeds ▪ Mixed intercropping ▪ Utilizing mulbery by-products ▪ Marketing quality mulbery products ▪ Safety precautions • Recording

Propagate mulberry:

Task steps	Terminal performance objectives	Related technical knowledge
1. Select nursery site 2. Identify/ select variety of mulberry 3. Prepare nursery bed 4. Propagate mulberry by seeds 5. Propagate mulberry by hard wood cuttings 6. Propagate mulberry by soft wood cuttings 7. Apply plant growth regulators 8. Propagate mulberry by layering 9. Propagate mulberry by grafting 10. Perform weeding 11. Perform irrigation 12. Protect plants from natural hazards 13. Protect plants from pests/ diseases 14. Cull unnecessary shoots 15. Uproot ready saplings 16. Transplant the saplings 17. Distribute saplings	***Condition(given):*** Necessary tools, materials, equipment, and supplies ***Task (what?):*** Propagate mulberry ***Standard (how well?):*** • All the task steps carried out in a sequential order of the activity flow • Mulberry plant propagated in accordance with the technically accepted principles and procedures of plant propagation • All the necessary safety precautions carefully followed well in advance • Secured at least 60% score in knowledge tests	Propagation of mulberry: • Selection of nursery site • Selection of variety of mulberry • Nursery bed preparation • Propagating mulberry by seeds • Propagate mulberry by hard wood cuttings: • Propagate mulberry by soft wood cuttings • Applying plant growth regulators • Propagate mulberry by layering • Propagating mulberry by grafting • Weeding • Irrigation • Protecting plants from natural hazards • Protecting plants from pests/ diseases • Culling unnecessary shoots • Uprooting ready saplings • Transplanting the sapling • Distributing saplings

Develop concept of sericulture:

Task steps	Terminal performance objectives	Related technical knowledge
1. Collect technical terminologies related to sericulture 2. Define the technical terminologies related to sericulture 3. Develop technical concept of the followings: • Sericulture farming • Managing related tools/ materials/ equipment • Managing young age silk worm rearing • Managing adult age silk worm rearing • Mounting ripen silk worms • Handling cocoon • Utilizing related by-products • Marketing quality silk products • Managing sericulture through group approach • Safety precautions 4. Keep records	***Condition(given):*** List of technical terminologies related to sericulture, necessary tools, materials, equipment, and supplies ***Task (what?):*** Develop concept of sericulture ***Standard (how well?):*** • Concept of sericulture well developed as specified in the task steps • Secured at least 60% score in knowledge tests	Concept of sericulture: • Listing technical terminologies related to sericulture • Definitions of the technical terminologies related to sericulture • Concept - what, why, where, when, and how? - of the followings: ▪ Sericulture farming ▪ Managing related tools/ materials/ equipment ▪ Managing young age silk worm rearing ▪ Managing adult age silk worm rearing ▪ Mounting ripen silk worms ▪ Handling cocoon ▪ Utilizing related by-products ▪ Marketing quality silk products ▪ Managing sericulture through group approach ▪ Safety precautions • Recording

Rear young age silk worms

Task steps	Terminal performance objectives	Related technical knowledge
1. Plan for chawki rearing center(CRC) 2. Establish mulberry garden for VRC 3. Identify young age silk worms 4. Establish/ develop rearing house for CRC 5. Disinfect rearing house 6. Procure silk worm eggs 7. Incubate silk worm's eggs 8. Perform brushing of ants 9. Prepare mulberry leaves for feeding 10. Feed young silk worms 11. Perform bed cleaning 12. Spread the bed 13. Care for the moulting worms 14. Adjust temperature/ humidity/ventilation/ lighting 15. adopt body disinfection of silk worms 16. Distribute the worms 17. Follow precautions 18. Keep records	***Condition(given):*** Necessary tools, materials, equipment, supplies and formats ***Task (what?):*** Rear young age silk worms ***Standard (how well?):*** • All the task steps carried out in a sequential order of the activity flow • young age silk worm rearing activities well managed • All the necessary safety precautions carefully followed well in advance • Secured at least 60% score in knowledge tests	Rearing young age silk worms: • Planning for chawki rearing center(CRC) • Establishing mulberry garden for VRC • Identifying young age silk worms • Establish/ develop rearing house for CRC • Disinfecting rearing house • Procuring silk worm eggs • Incubating silk worm's eggs • Performing brushing of ants • Preparing mulberry leaves for feeding • Feeding young silk worms • Performing bed cleaning • Spreading the bed • Caring the moulting worms • Adjusting temperature/ humidity/ventilation/ lighting • Adopting body disinfection of silk worms • Distribution of the worms • Precautions to be followed • Keepimg records

Rear adult age silk worm

Task steps	Related technical knowledge	Related technical knowledge
1. Plan of seasonal rearing of adult age silk worms 2. Prepare rearing house 3. Identify adult age silk worms 4. Disinfect the rearing house/ appliances 5. Procure incubated silk worms 6. Prepare mulberry shoots for feeding 7. Feed adult silk worms 8. Perform bed cleaning 9. Spread the bed 10. Care for moulting worms 11. Adjust temperature/ humidity/ventilation 12. Apply body disinfectant 13. Identify mature/ ripen worms 14. Follow precautions 15. Keep records	***Condition(given):*** Necessary tools, materials, equipment, supplies and formats ***Task (what?):*** Rear adult age silk worms ***Standard (how well?):*** • All the task steps carried out in a sequential order of the activity flow • Adult age silk worm rearing activities well managed • All the necessary safety precautions carefully followed well in advance • Secured at least 60% score in knowledge tests	Rearing adult age silk worms: • Plan of seasonal rearing of adult age silk worms • Preparing rearing house • Identifying adult age silk worms • Disinfecting the rearing house/ appliances • Procuring incubated silk worms • Preparing mulberry shoots for feeding • Feeding adult silk worms • Bed cleaning • Spreading the bed • Caring for moulting worms • Adjusting temperature/ humidity/ventilation • Applying body disinfectant • Identifying mature/ ripen worms • Precautions to be followed • Keeping records

Mount ripen silk worms

Task steps	Related technical knowledge	Related technical knowledge
1. Prepare mountage materials 2. Pick up ripen worms 3. Mount the ripen worms 4. Maintain density 5. Remove the unpinning/ dead worms 6. Care for worms in mountages 7. Identify ripen cocoon 8. Harvest ripen cocoon 9. Follow precautions 10. Keep records	***Condition(given):*** Necessary tools, materials, equipment, supplies and formats ***Task (what?):*** Mount ripen silk worms ***Standard (how well?):*** • All the task steps carried out in a sequential order of the activity flow • Mounting of ripened silk worm done safely • All the necessary safety precautions carefully followed well in advance • Secured at least 60% score in knowledge tests	Mounting ripen silk worms: • Preparing mountage materials • Picking up ripen worms • Mounting the ripen worms • Maintaining density • Removing the unpinning/ dead worms • Caring for worms in mountages • Identifying ripen cocoon • Harvesting ripen cocoon • Precautions to be followed • Keeping records

Handle cocoons

Task steps	Terminal performance objectives	Related technical knowledge
1. Identify cocoons 2. Clean cocoons 3. Weigh cocoons 4. Select good /sellable/ quality cocoons 5. Dry the cocoons 6. Perform temporary storage of cocoons 7. Transport cocoons 8. Store bad cocoons 9. Follow precautions 10. Keep records	***Condition(given):*** Necessary tools, materials, equipment, and supplies ***Task (what?):*** Handle cocoons ***Standard (how well?):*** • All the task steps carried out in a sequential order of the activity flow • Cocoons handled safely • All the necessary safety precautions carefully followed well in advance • Secured at least 60% score in knowledge tests	Handling cocoons: • Identifying cocoons • Cleaning cocoons • Weighing cocoons • Selecting good /sellable/ quality cocoons • Drying the cocoons • Performing temporary storage of cocoons • Transporting cocoons • Storing bad cocoons • Precautions to be followed • Keeping records

Market quality products

Task steps	Terminal performance objectives	Related technical knowledge
1. Prepare marketing plan 2. Identify quality product 3. Harvest the product 4. Process the product for marketing 5. Store the product 6. Grade the product 7. Control product's quality 8. Fix price 9. Select marketing channel 10. Transport the product 11. Advertise to sell the product 12. Sell the product 13. Calculate cost 14. Calculate returns 15. Calculate profit/ loss 16. Prepare balance sheet 17. Prepare reinvestment plan 18. Perform financial evaluation of the enterprise 19. Improve standard of living 20. Follow precautions 21. Keep records	***Condition(given):*** Necessary tools, materials, equipment, supplies and formats ***Task (what?):*** Market quality products ***Standard (how well?):*** • All the task steps carried out in a sequential order of the activity flow • Quality products marketed safely • All the necessary safety precautions carefully followed well in advance • Secured at least 60% score in knowledge tests	Marketing quality products: • Preparing marketing plan • Identifying quality product • Harvesting the product • Processing the product for marketing • Storing the product • Grading the product • Controlling product's quality • Fixing price • Selecting marketing channel • Transporting the product • Advertising to sell the product • Selling the product • Calculating cost • Calculating returns • Calculating profit/ loss • Preparing balance sheet • Preparing reinvestment plan • Performing financial evaluation of the enterprise • Improving standard of living • Precautions to be followed • Keeping records

Reading materials:

Printed materials:

- Dahal, Ganga Ram, Resham Kheti Kina Ra Kasari, Nari Bikas Pariyojana, Illam
- Kafle, G. P., Resham Kheti, Krishi Sanchar Mahasakha
- Shrestha, Yogendra Man, Unnat Resham Kheti, Bikash Ko Nimti Sahayogi Samaj(S.D.P.), Kathmandu.
- DNDP, Resham Kheti Haate Kitab
- DNDP, Kimbu Kheti Bebasthapan

Facilities:

General:

- Land for the cultivation of mulberry plants
- Malberry farms / nurseries
- Malberry gardens for CRC
- Well equipped class rooms
- Necessary buildings
- Silk worm rearing laboratories
- Young age silk worm rearing houses
- Adult age silk worm rearing houses
- Well equipped library
- Stores
- Hostel (optimal)
- Canteen
- Vehicles
- Water supply
- Electricity supply

List of tools, materials, and equipment:

General:

- Computers
- Fax
- Photocopiers
- Over hear projectors
- Cassette players
- TV sets
- Printers
- Soft /pin boards
- White boards
- Black boards
- Clip/flip boards
- Filing cabinets
- Cameras
- Telephone sets
- Internet/e-mail facilities

Materials used in mulberry farming:

- Compost / fertilizer
- Agriculture lime
- Pesticides
- Sprayer / duster
- Saplings
- **Common farm tools**:
  - Spades
  - Pruning saw
  - secature
  - Rake
  - Khurpsa
  - grafting knives
- Polythine sheets,
- Poly-bags
- Pipes
- Drip irrigation accessories
- Shawls/ Picks
- Sprinkles
- Mired
- Jute
- Crop seeds / seedlings
- Mulching materials
- Baskets/Doko
- Buckets /mugs
- Hand trolley

Materials used in silkworm rearing laboratory:

- Sprayer
- Dusts
- Buckets
- Mugs
- Incubation trays
- Thermo hygrometers
- Maximum thermometer
- Minimum thermometer
- Rearing trays
- Chopping knife
- **Disinfectants:**
  - Bleaching powder,
  - Foredeck,
  - lime,
  - Benzoic acid,
  - Captan,
  - Parmaldehyde etc.
- Feathers
- Brush
- Forceps
- Jute sheets
- Cleaning nets
- Polythene sheets
- Butter paper
- Brown paper
- News paper
- Shoot rearing rack
- Rearing stand
- Slages
- Feeding stand
- Ropes
- Brooms
- Mountages
- Mountages frame
- Cleaning net frame
- Plastic /jute thread
- Plastic Mom loges
- Monating brush
- Rotary mountages
- Hand trolley

Machinery used in Mulberry farms:

- Pruning Machine
- Power sprayers & Duster
- Power tiller

Machinery used in silkworm rearing:

- Incubator
- Humitityfier
- Dehumitityfier
- Power sprayer with gas mask
- Gotor sprayer
- Digital thomohygrometers
- Digital weighing balance
- Triple beam weighing balance
- Heaters
- Air cooler
- Floss remover
- Cocoon inspection table
- Cocoon separating table
- Cocoon dryer
- Cocoon cooking machine
- Cocoon storing racks
- Cocoon cooking pans
- Cocoon cooking stoves
- Jaguri machine sets
- Spinning wheel sets
- Reeling charkha
- Reeling machine
- Vacuum treating machine for re-reeling / twisting
- Re-reeling sets
- Booking sets
- Twisting machine sets