Introduction of Non Wood Forest Products

[*Non-wood forest products (NWFPs)*](http://www.fao.org/docrep/x2450e/x2450e0d.htm#fao) are goods of biological origin other than wood, derived from forests, other wooded land and trees outside forests. NWFPs and similar terms such as “minor”, “secondary” and “non-timber” forest products (NTFPs) have emerged as umbrella expressions for the vast array of both animal and plant products other than wood derived from forests or forest tree species.

1. 1. **NON TIMBER FOREST PRODUCE** ® Non-timber forest products (NTFPs), also special, non-wood, minor, alternative and secondary forest products, are useful substances, materials and/or commodities obtained from forests which do not require harvesting (logging) trees. They, seeds, berries, mushrooms, oils, foliage, medicinal plants, fuelwood, and forage. ® The United Kingdom's Forestry Commission defines NTFPs as "any biological resources found in woodlands except timber ® These definitions include wild and managed game, fish and insects.[4] NTFPs are commonly grouped into categories such as floral greens, decoratives,medicinal plants, foods, flavors and fragrances, fibers, and saps and resins.
2. [**2.**](https://image.slidesharecdn.com/ntfp-170417190256/95/introduction-of-non-wood-forest-products-2-638.jpg?cb=1492455803)**ECONOMIC IMPORTANCE** ® Economic importance ® It is difficult to estimate the contribution of NTFPs to national or regional economies as there is a lack of broad-based systems for tracking the combined value of the hundreds of products that make up various NTFP industries. Some of the importance is given below ® Medicinal plants are used in many areas for medical purposes ® Mushroom /guchi is an important source of income in hilly areas ® Game birds and animals provide income in protected areas ® Sericulture is an important cottage industry ® Apiculture is important source of livelihood in hilly areas and plain area ® In tropical forests, for example, NTFPs can be an important source of income that can supplement farming and/or other activities. ® Alysis of the Amazon rainforest shows in Peru found that exploitation of NTFPs could yield higher net revenue per hectare than would timber harvest of the same area, ® Their economic, cultural and ecological value, when considered in aggregate, makes managing NTFPs an important component ofsustainable forest management and the conservation of biological and cultural diversity.
3. [3.](https://image.slidesharecdn.com/ntfp-170417190256/95/introduction-of-non-wood-forest-products-3-638.jpg?cb=1492455803)**SERICULTURE** ® Sericulture, or silk farming, is the rearing of silkworms for the production of silk. Although there are several commercial species of silkworms, Bombyx mori (the caterpillar of the domesticated silk moth) is the most widely used and intensively studied silkworm. Silk was first produced in China as early as the Neolithic period (period in the development of human technology, beginning about 10,200 BC, according to the ASPRO chronology, in some parts of the Middle East, and later in other parts of the world[2] and ending between 4,500 and 2,000 BC.) ® Sericulture has become an important cottage industry in countries such as Brazil, China, France, India, Italy, Japan, Korea, and Russia. Today, China and India are the two main producers, with more than 60% of the world's annual production.
4. [4.](https://image.slidesharecdn.com/ntfp-170417190256/95/introduction-of-non-wood-forest-products-4-638.jpg?cb=1492455803)**PRODUCTION OF SILK** ® Silkworm larvae are fed with mulberry leaves, and, after the fourth moult, climb a twig placed near them and spin their silken cocoons. This process is achieved by the worm through a dense fluid secreted from its structural glands, resulting in the fiber of the cocoon. The silk is a continuous filament comprising fibroin protein, secreted from two salivary glands in the head of each larva, and a gum called sericin, which cements the filaments. The sericin is removed by placing the cocoons in hot water, which frees the silk filaments and readies them for reeling. This is known as the degumming process.[6] The immersion in hot water also kills the silkworm pupae. ® Single filaments are combined to form thread, which is drawn under tension through several guides and wound onto reels. The threads may be plied to form yarn. After drying, the raw silk is packed according to quality.
5. [5.](https://image.slidesharecdn.com/ntfp-170417190256/95/introduction-of-non-wood-forest-products-5-638.jpg?cb=1492455803)MORPHOLOGY OF SILKWORM ® The body is divided into three segments as other insect ® Head: Head is again consist of six body segment ® Thorax: Prothorax, Mesothorax and Metathorax ® Abdomen is consist of eleven segments
6. [6.](https://image.slidesharecdn.com/ntfp-170417190256/95/introduction-of-non-wood-forest-products-6-638.jpg?cb=1492455803)STAGES OF SILK ® Stages of production[edit] ® The stages of production are as follows: ® The silk moth lays thousands of eggs. ® The silk moth eggs hatch to form larvae or caterpillars, known as silkworms. ® The larvae feed on mulberry leaves. ® Having grown and moulted several times silkworm weaves a net to hold itself ® It swings its head from side to side in a figure '8' distributing the salivar that will form silk. ® The silk solidifies when it contacts the air. ® The silkworm spins approximately one mile of filament and completely encloses itself in a cocoon in about two or three days. The amount of usable quality silk in each cocoon is small. As a result, about 2500 silkworms are required to produce a pound of raw silk)[7] ® The silk is obtained by brushing the undamaged cocoon to find the outside end of the filament. ® The silk filaments are then wound on a reel. One cocoon contains approximately 1,000 yards of silk filament. The silk at this stage is known as raw silk. One thread comprises up to 48 individual silk filaments. ® Mahatma Gandhi was critical of silk production based on the Ahimsa philosophy "not to hurt any living thing".
7. [7.](https://image.slidesharecdn.com/ntfp-170417190256/95/introduction-of-non-wood-forest-products-7-638.jpg?cb=1492455803)SYSTEMATIC POSITION ® Class: Insecta ® Order: Lepidoptera ® Family: Bombycidae ® Genus: Bombyx, ® Species: B. mori ® Life cycle of Silk worm ® 1. Adult 2. Larvae 3. Pupae 4. Egg ® The “silkworm” is, technically, not a worm but a moth pupa. For the sake of simplicity and consistency, however, we will use the term silkworm throughout this writing.]
8. [8.](https://image.slidesharecdn.com/ntfp-170417190256/95/introduction-of-non-wood-forest-products-8-638.jpg?cb=1492455803)SILK PRODUCTION ® Commercial silk is made by boiling the intact cocoons and unwinding the single silk strand onto reels. Only a few moths are allowed to emerge to continue the population of silkworms. The rest are killed by being boiled in their cocoons. “Peace silk”, also known as “vegetarian silk” is raised and processed differently. The moths are allowed to emerge from their cocoons to live out their full life cycle. The silk is degummed and spun like other fiber, instead of being reeled. The resulting yam is soft, fluffy, and light like a cloud. This is the best silk for warmth and therapeutic use. ® Silk is an animal protein fiber produced by certain insects to build their cocoons and webs. ® Many different types of silk are produced by a huge variety of different types of insects other than moth caterpillars. Yet none of these have been exploited for commercial purposes, though there has been basic research into the structures of such silks. Silk is most commonly produced by larvae, and thus largely limited to insects with complete metamorphosis.
9. [9.](https://image.slidesharecdn.com/ntfp-170417190256/95/introduction-of-non-wood-forest-products-9-638.jpg?cb=1492455803)SPINNING THE COCOON ® The silkworm attaches itself to a compartmented frame, twig, tree or shrub in a rearing house to spin a silk cocoon over a 3 to 8 day period. This period is termed pupating. ® Silkworms possess a pair of specially modified salivary glands called sericteries, which are used for the production of fibroin – a clear, viscous, proteinaceous fluid that is forced through openings called spinnerets on the mouthpart of the larva. ® Liquid secretions from the two large glands in the insect emerge from the spinneret, a single exit tube in the head. The diameter of the spinneret determines the thickness of the silk thread, which is produced as a long, continuous filament. The secretions harden on exposure to the air and form twin filaments composed of fibroin, a protein material. A second pair of glands secretes a gummy binding fluid called sericin which bonds the two filaments together. ® Steadily over the next four days, the silkworm rotates its body in a figure-8 movement some 300,000 times, constructing a cocoon and producing about a kilometer of silk filament. ® Reeling the Filament ® At this stage, the cocoon is treated with hot air, steam, or boiling water. The silk is then unbound from the cocoon by softening the sericin and then delicately and carefully unwinding, or 'reeling' the filaments from 4 - 8 cocoons at once, sometimes with a slight twist, to create a single strand. ® As the sericin protects the silk fiber during processing, this is often left in until the yarn or even woven fabric stage. Raw silk is silk that still contains sericin. Once this is washed out (in soap and boiling water), the fabric is left soft, lustrous, and up to 30% lighter. The amount of usable silk in each cocoon is small, and about 2500 silkworms are required to produce a pound of raw silk. ® Much care is needed in obtaining the cocoon as it may affect quality of silk in case of earlier or late harvest. ® Bivoltine are those species which produce silk twice in one year ® Multivoltine are those species which produce silk many times in a year
10. [10.](https://image.slidesharecdn.com/ntfp-170417190256/95/introduction-of-non-wood-forest-products-10-638.jpg?cb=1492455803)SEPARATION OF COCOON ON THE BASIS OF QUALITY ® Double cocoon: when two or more larvae form one cocoon which result in intermingling of silk ultimately with lower quality of silk. Reason is limited space for pupation ® Dead silkworm cocoon: Sometime pupae die in the cocoon which stain the silk ® Scaf fold pressed cocoon: Deformed cocoon are difficult to obtain silk ® Stained cocoon: stained with facal material or dying of pupae ® Broken ends cocoon: ® Loose unit cocoon: cocoon which cannot afford slight pressure ® Multilayered cocoon: Due to temperature difference in day and night time
11. [11.](https://image.slidesharecdn.com/ntfp-170417190256/95/introduction-of-non-wood-forest-products-11-638.jpg?cb=1492455803)VIRAL DISEASES ® Symptom: ® The larvae will be sluggish with swollen intersegmantal region ® The integument of diseases larvae will be fragile and brakes easily ® On infury milky fluid containing many polyhedral inclusion bodies oozes out from the larval body ® The diseases larvae do not settle for moult and showshining integument ® The larvae appear to be restless ® The dead larvae hand by hind legs head downward ® Management ® Sun drying of rearing appliances for one/two days Disinfection of rearing room and appliances with 5% bleaching powder ® Disinfection of worms, trays and discarding of diseased worms Ensure proper ventilation and air circulation ® Provide proper bed spacing Feed the larvae with nutritious mulberry leaves ® Collect and burn infected larvae, faecal matter and bed refuses Early diagnosis and rejection of infected lots ® Dust the bed disinfectant, Vijetha (or) Resham Keet Oushadh on the larvae, after each moult and ½ hr. before resumption of feeding (3 kg/100 dfl). ® Spray 1% of extract of Psoralea coryleifolia on mulberry leaves, shade dry and feed worms once during third instars. ® Bacterial diseases Bacteria and viruses cause the disease individually or in combination. Fluctuating temperature and humidity and poor quality mulberry predispose the disease development. ® The diseased larvae will be stunted in growth, dill lethargic soft and appear flaccid ® The cephalothoracic region may be translucent ® The larvae vomit gut juice, develop dysentery and excrete chain type fecus. ® The larvae on death putrefy, develop different and emit foul smell ® Management ® Maintenance of hygienic condition Disinfection of rearing room and appliances ® Disinfection of worms, trace and discarding of sick worms ® Avoid injury to the worms, overcrowding of trays and accumulation of faeces in the rearing bed ® Sound management, improving the rearing environment and feed stuff Feeding the larvae with healthy nutritious leaves. ® Early diagnosis and rejection of infected lots Avoid spraying commercial B. t. insecticides in nearby mulberry field. ® Apply antibiotics like Streptomycin/Tetracyclin/Ampicillin
12. [12.](https://image.slidesharecdn.com/ntfp-170417190256/95/introduction-of-non-wood-forest-products-12-638.jpg?cb=1492455803)DISEASE OF SILKWORM® Fungal diseases ® White muscadine is caused by a fungus Beauveria bassiana and the green muscadine is caused by a fungus Spicaria prasina. Aspergillosis is common in young age silkworms and the infected larvae will be lustrous and die. Dark green (Aspergillus flavus) or rusty brown ( Aspergillus tamari)mycelial cluster are seen on the dead body. ® The diseases larvae prior to death will be lethargic and on death are flaccid ® oil specks may be seen on the surface of larvae ® They gradually be fome hard, dry and mummify into a white or green coloured structure ® The diseases pupae will be hard, lighter and mummifies ® Magagement ® Sundry the rearing appliances. ® Disinfect the rearing room and utensils with 5 per cent bleaching powder ® Avoid low temperature and high humidity in the rearing room ® Keep the rearing bed thin and dry ® Early diagnosis and rejection of infected lots ® Apply Dithane M45 (3 kg/100 dfls) / Vijetha supplement as disinfectant on the larvae ® Disinfect rearing rooms and trays with 4 per cent pentachlorophenol to control Aspergillosis. ® Protozoal diseases i. e Pebrine diseases ® Diseases larvae show slow growth, undersized body and poor appetite. ® Diseases larvae reveal pale and flaccid body. Tiny black spots appear on larval integument. ® Dead larvae remain rubbery and do not undergo putrefaction shortly after death. ® Management of Pebrine ® Produce healthy eggs Disinfection of rearing room and utensils ® Maintain strict hygienic conditions during rearing ® Surface disinfect the layings in 2 per cent formalin for 10 minutes before incubation. ® Collect and burn the diseased eggs, larvae, pupae and moths, bed refuses, faecal pellets, etc
13. [13.](https://image.slidesharecdn.com/ntfp-170417190256/95/introduction-of-non-wood-forest-products-13-638.jpg?cb=1492455803)DWARF PALM (NANNORHOPS RITCHIEANA) ® Introduction ® Dwarf Palm (Nannorhops ritchieana) is monocotyledonous plant spe- cies belonging to family Arecaceae (Palmae). Arecaceae is a large family of 200 - 210 genera and 2800 - 3000 species distributed mainly in the tropical and sub-tropical regions of the world. ® Mazri is the local name of dwarf palm (Nannorhops ritchieana) It is gregarious, usually small tufted palm, from a much branched underground rhizome. ® It is native to South Europe, North Africa and Western Asia, distributed in Pakistan, Afghanistan and S. Persia in the mediterrannean arid regions [3]. ® Mazri collection and processing of raw material into useful products are major source of income for poor and especially for rural women who are mostly landless fami- lies. Its processing is the only source of personal income for women
14. [14.](https://image.slidesharecdn.com/ntfp-170417190256/95/introduction-of-non-wood-forest-products-14-638.jpg?cb=1492455803)® Nannorrhops ritchiana (Mazari palm) is the sole species in the genus Nannorrhops in the palm family Arecaceae. It is native to southwestern Asia, from the southeast of the Arabian Peninsula east through Iran and Afghanistan to Pakistan and northwestern India, growing at altitudes of up to 1600 m
15. [15.](https://image.slidesharecdn.com/ntfp-170417190256/95/introduction-of-non-wood-forest-products-15-638.jpg?cb=1492455803)GOODS OF MAZRI ® Bozay(P), Punkha(S,U) Hand Fan ® Tokrai (P), Tokri (S,U) Basket ® Topai (P), Topi (S,U) Cap and Hat ® Chabai (P), Chabbi (U,S) Hot Pot ® Thaday (P), Chataee (S,U) Small mat ® Raybaj (P), Jaru (U), Boowari (S) Broom ® Masala (P), Ja-e-Namaz (U) Carpet or mat used by single person to pray on ® Skore (P), Changer (U,S) Tray ® Saf (P,U,S) Long mat used for prayer in mosque. ® Wanr (P), Wan (U,S) Rope
16. [16.](https://image.slidesharecdn.com/ntfp-170417190256/95/introduction-of-non-wood-forest-products-16-638.jpg?cb=1492455803)PRODUCTS OF HONEY BEES ® All bees products can be classified into two large groups: the products of animal and plant origin. ® Honey is a thick, sweet, syrupy substance and is the most basic of the honey- bee products. Bees produce honey by collecting pollen, mead, nectar and other sweet syrups from plants, which they enrich with substances from their own body and place into honeycombs, where this mass matures into honey. Honey was originally used as a sweetener and a nutritional additive, to be increasingly used later in pharmaceutics and medicine. ® An important bee product is pollen, as well. Pollen is an essential ingredient to the life of every beehive. Without pollen, bees could not produce food for the embryo and the “mother”, which would lead to their extinction. While honey provides bees with fructose and glucose sugars, enzymes and mineral ingredients, pollen provides them with sufficient protein, fats, vitamins and minerals. Honey provides bees with the energy needed to collect pollen and nectar. ® Propolis is a mixture of wax and glutinous substances, collected by the bees from the buds of perennial plants. Propolis is used by the bees to reinforce the honeycomb and to seal the gaps. It performs the role of disinfecting the wax cells and the entire beehive. Propolis contains easily volatile etheric oils possessing clearly marked antimicrobial effects. Beeswax is used by the bees to construct the honeycomb, where they afterwards lay their larvae and store food reserves. Since it is very dark in a beehive, bees use the honeycomb as a means of communication, utilizing its vibrations to communicate.
17. [17.](https://image.slidesharecdn.com/ntfp-170417190256/95/introduction-of-non-wood-forest-products-17-638.jpg?cb=1492455803)® Bee venom is a product used by the bees as a means of defense against many aggressors desiring to take their riches. Its main field of application is in medicine. ® Royal jelly, perhaps the most important bee product stimulates regular growth and development of an organism, adds the needed strength, activates metabolic processes in an organism, maintains a regular functioning of the endocrinal system. By using royal jelly, a normalization in the functioning of all systems and organism as a whole is achieved.
18. [18.](https://image.slidesharecdn.com/ntfp-170417190256/95/introduction-of-non-wood-forest-products-18-638.jpg?cb=1492455803)® Beeswax is a bee product, and at the same time, in beekeeping, it is a reproductive material. It is a product of young bees that secrete it from their wax-producing glands. Conditions for secreting wax are warm weather and a good intake of both nectar and pollen. As a reproductive material, wax is used in beekeeping in the form of a honeycomb base.
19. [19.](https://image.slidesharecdn.com/ntfp-170417190256/95/introduction-of-non-wood-forest-products-19-638.jpg?cb=1492455803)® What propolis is ® Apis mellifera honeybees collect resins and gums from buds or injured areas of plants. This glue-like substance, usually dark brown in colour, is called propolis. Just as with honey and pollen, propolis differs in composition according to the plants from which bees have been collecting. Propolis is usually coloured dark brown, but it can also be yellow, green or red. ® Apis mellifera honeybees use propolis to keep their homes dry, draught proof, secure and hygienic. When Apis mellifera nest in the wild, for example in a hollow tree, the inside walls of the tree appear smoothly varnished with propolis. In this way, propolis is used to seal up any cracks where microorganisms could flourish, and its volatile oils most likely serve as a kind of antiseptic airfreshener. In addition, bees use propolis: ® Use of propolis by humans Propolis has antiseptic and anaesthetic properties and is commonly used as an ingredient in medicines, toothpastes, oral sprays and chewing gums, and in shampoos, soap, skin ointments and cosmetics. ® Royal jelly is a milky white liquid. It is a food for bee larvae, secreted from a complex of glands known as the "salivary gland complex" - the chief one of which is the hypopharyngeal gland of nurse worker bees (worker bees attending the brood). It also contains some sugars and proteins added from the worker bees' stomachs. A larva destined to become a queen bee develops in an especially large wax cell inside which worker bees place lavish amounts of royal jelly ® Royal jelly has many different components including proteins, sugars, fats, minerals and vitamins.
20. [20.](https://image.slidesharecdn.com/ntfp-170417190256/95/introduction-of-non-wood-forest-products-20-638.jpg?cb=1492455803)® Absconding ® Absconding is the departure of adult bees from their nest, leaving behind whatever brood and food stores are in it. Bees abscond their nests for a number of reasons including a shortage of food supply in the nest, disturbance to the bees, excessive heat and cold or poor ventilation, old and defective and attack by pests and diseases. A colony preparing for absconding does not defend itself against pests, ceases brood-rearing (although the queen continues to lay eggs), has a small, scattered brood or no brood at all, has little or no food stores. Bees also stop cleaning the hive, cannibalism is observed (that is, adult bees first devour young larvae, then older larvae, and finally the pupae) progressive reduction in the relative number of pollen carriers entering the hive is noted ® Absconding can be prevented by: ® Feeding sugar syrup (prepared by dissolving two parts sugar in one part water) into the colony every evening; ® Providing shade during summer, warmth during winter, and adequate ventilation; ® Removing old and defective combs from the hive and keeping the bottom board clean; and ® Finally, taking up measures to control diseases and pests. ® Robbing ® Robbing is the condition where bees of one beehive try to rob the bees of another of their nectar and stored honey. Uncontrolled, robbing can lead to the death of many worker bees. Robbing occur because of lack of food in one of the colonies, especially at the end of the spring and winter seasons and happens when honey and sugar syrup drops from the hive tools while inspecting the colon bees of both hives try to eat the honey. ® Robbing can be prevented by: ® Supplying brood frame from strong colonies to save weak colonies from robbing ® Uniting the weak colonies ® Preventing honey droppings while handling the combs ® Cleaning all equipment and tools after honey harvest ® Placing sugar syrup carefully inside the hive and always feeding the colonies at evening
21. [21.](https://image.slidesharecdn.com/ntfp-170417190256/95/introduction-of-non-wood-forest-products-21-638.jpg?cb=1492455803)WILD EDIBLE MUSHROOM
22. [22.](https://image.slidesharecdn.com/ntfp-170417190256/95/introduction-of-non-wood-forest-products-22-638.jpg?cb=1492455803)KPK AND AZAD KASHMIR