Rainfed sericulture in Karnataka, India

GENERAL INFORMATION	
Sources of information of the practice	Sustainet, Sustainable Agriculture Information Networks, cooperative project of the German Council for Sustainable Development. Result of the workshop entitled **Evaluation of project experiences through local partners (self-evaluation) and assessment of each project's Scaling-up potential**, held in India
Relevant contacts	Project Secretariat, GTZ, Dag-Hammarskjöld-Weg 1-5, Postfach 5180 D, 65726 Eschborn, Germany BAIF Institute for Rural Development – Karnataka, Sharadanagara, Tiptur 572202, Tumkur District, Karnataka Tel: 08134- 250659/ 250658/ 254421/ 251337 E-mail: PDR@birdk.org
Useful links	Sustainet www.sustainet.org BAIF www.birdk.org/
INFORMATION ABOUT THE PROGRAMME OR PROJECT PROMOTING THE PRACTICE (IF APPLICABLE)	
Programme or project	Rainfed sericulture
Time frame	2002 – 2004
Donor	Government of Germany
Implementer of the programme or project	Local NGO: BAIF Institute for Rural Development - Karnataka
LOCATION OF THE PRACTICE	
Region	Asia
Country	India
Province, Districts, Villages	Districts of Tumkur and Dharwad, State of Karnataka
Climatic zone	From sub-humid to dry semi-arid
Other descriptive information	-
INFORMATION ABOUT THE PRACTICE	
Practice category	Managing natural resources sustainably
Practice type	Technology for natural resource management Technology for improving farm productivity sustainably
Sector	Crop production system management
Institutions fostering the practice	Local NGO: BAIF Institute for Rural Development - Karnataka
Beneficiaries of the practice	120 rural families living below the poverty line
Users of the practice	120 rural families living below the poverty line
Natural resource used or accessed (if applicable)	Land, water, mulberry trees, silkworm eggs
BRIEF DESCRIPTION OF THE PRACTICE	
Background/problem statement	Sericulture is one of the major agro-based activities which can provide gainful self-employment for poor families in rural areas on their own land. It is an enterprise with a very short gestation period, having the potential to generate adequate returns from a very small piece of land. However, lack of irrigation potential, depleting ground water and high initial investment costs limit large-scale adoption of sericulture as a livelihood option for the majority of poor families. Sericulture involves different steps: 1) the cultivation of mulberry gardens as mulberry leaves are the only feed for silkworms, 2) the construction of a shed to ensure specific climatic conditions (humidity of about 75-80% and a minimum temperature of 27°C). The whole process from egg to cocoon takes one month.

	Sericulture has been a profitable business for irrigated farms in the state of Karnataka for some time and some farmers of the project target group had heard of this practice. However, they didn't have the opportunity to engage in sericulture activities as the irrigation systems that are needed to cultivate mulberry in dry conditions were neither in place nor financially feasible. Although some farmers knew the basic steps involved in sericulture, there was also a lack of mulberry cultivation and silk worm rearing skills. In addition, there was a lack of appropriate soil moisture conservation skills and technologies which resulted in an under-utilization of rain water, an exploitation of ground water and severe soil erosion. Under these conditions, the number of crops that could be cultivated was restricted to a few unprofitable ones (green gram, finger millet, paddy, horse gram, and fodder jower) and were mainly produced for subsistence. During the dry season farmers depended on off-farm labour. Poverty was widespread among the families in the project area.
Approach followed	BAIF elaborated the idea of developing and promoting a rainfed system for sericulture. The project took place in three villages (Thammadihalli, Baluvaneralu and Bagadagere) in the districts of Tumkur and Dharwad in the state of Karnataka. This region receives an annual rainfall of around 450mm with maximum 40 rain days per year. A baseline survey of 120 selected participant families and net planning for locating rainfed sericulture plots on a micro-catchment basis was carried out systematically. After the survey, Self Help Groups were formed for effective involvement in the implementation of the project and decision-making on, for example, what chemicals are needed to disinfect the sheds, where to rear the silkworms, when to buy the silk worm eggs, whether to take out loans to do so, etc. Exposure, training and capacity building were important tools to guide farmers in setting up mulberry gardens under rainfed conditions. Special emphasis was given to encouraging and training women members of the participant families. Technical training on cultivation of regional mulberry varieties, nursery raising, rainwater harvesting techniques, vermi-composting and silk worm rearing, was organized by BIAF at a training center in Tiptur. Field demonstrations on incubation, black boxing and brushing were organised. BIAF introduced the biomass-filled trench system to improve the conservation of moisture in the soil. The decomposing biomass provides the necessary nutrients to the mulberry plantation in addition to acting as a sponge to absorb maximum moisture and retain the same *in situ*. Every trench acts as mini water harvesting tank and moisture retention pocket. The mulberry plants were spaced in rows of 4 ft x 2 ft and 3ft x 2 ft rows alternatively. In the 4ft spacing 2ft wide by 2ft deep trenches were dug. The trenches run all along the plantation with intermediary sectors at appropriate intervals. Low cost silkworm rearing sheds were constructed in each farmer's mulberry plots with locally available materials. Rearing equipment, disinfectants and other necessary equipment were distributed to all the participants. Adoption of water conservation technologies played a very important role in improving the quality of water. A series of farm ponds further helped in recharging bore wells and increasing the quantity and quality of water on the farms. Adoption of cost effective and eco-friendly techniques in the promotion of rainfed sericulture opened a new ray of hope in poverty alleviation, employment and income generation and stopped distress migration. This model was found to be fairly effective in maintaining *in situ* soil moisture for a longer time. The technology has been adopted by 30 non-participant villagers in the project area so far. In addition, many farmers came from other villages, often from far away, to learn about rainfed sericulture.
Innovative elements	Biomass-filled trench system to improve the conservation of moisture in the soil

Impacts on natural resource base	Actual: Soil fertility increased due to a higher content of organic matter and increased water retention capacity. Erosion stopped due to the planting of trees and the construction of water harvesting facilities. The exploitation of ground water stopped and the ground water table began to rise again. The water quality increased, as did its availability for livestock. Previously uncultivable land can now be used to grow a profitable crop.
Impacts on livelihood of the practice users	Actual: Increased income; half an acre of mulberries produces about 25kg of silkworm cocoons and 3-4 crops each year can be harvested. One kg can be sold at a minimum of Rs110, therefore half an acre can generate an extra income of at least Rs11.000 per year. The families can now cover their major expenses like education and health services and even manage to save. Women's employment increased and their status in the community improved considerably.
Other impacts	Actual: The creation of employment (farmers do not depend on off-farm labour anymore) resulted in reduced migration.
General success factors	• The presence of good marketing facilities created by the government and industries linked the farmers to a profitable market • Production sites for silk worm eggs are in the vicinity of the villages • BAIF's experience in combination with local knowledge of sericulture provided the expertise to adopt this farming system • Occurrence of uncultivated hilly land suitable for specific moisture conservation techniques • Occurrence of a minimum amount of rainfall
Technology success factors	Generate incomes with acceptable limit of risk Increase employment opportunity Increase farm production and/or stabilizes it No adverse environment effects, preventing erosion and improving soil fertility
Institutional success factors	Farmer's capacity for adoption of the technology Incentives, credit and markets
Problems remaining to be resolved	There are several constraints which limit the spread of sericulture among poor and marginal farmers i.e. the need for technical support and water facilities. Moreover, egg production is a separate activity, since it has to take place in a hygienic environment and requires certain scientific skills. Production sites for silk worm eggs are necessary to implement the practice. Crops have to be sold straight after harvest since the cocoons are a very perishable product.
Keywords	Agricultural development, agriculture, animal breeding, animal products, capacity building, crop production, crops, employment, environmental management, rainfed farming, soil fertility, technology transfer, water conservation, water resources