Non Pesticide Management in Andhra Pradesh, 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 on **Evaluation of project experiences through local partners (self-evaluation) and assessment of each project's Scaling-up potential**, hold in India. Section on "Potentials and opportunities for scaling-up" written by Felix zu Knyphausen.
Relevant contacts	Project Secretariat, GTZ, Dag-Hammarskjöld-Weg 1-5, Postfach 5180 D, 65726 Eschborn, Germany
Useful links	Sustainet www.sustainet.org Centre for Sustainable Agriculture www.csa-india.org Socio-Economic and Cultural Upliftment in Rural Environment www.aea-india.org/secure.htm
INFORMATION ABOUT THE PROGRAMME OR PROJECT PROMOTING THE PRACTICE (IF APPLICABLE)	
Programme or project	Pest management project
Time frame	1999 - 2005
Donor	European NGOs: Hivos, Netherlands (www.hivos.nl/english), and Action for World Solidarity, Germany (www.en.aswnet.de) Local NGO : Centre for Sustainable Agriculture (CSA) State Government Initiative: Society for Elimination of Rural Poverty (SERP) (www.velugu.org)
Implementer of the programme or project	Local NGO : Socio-Economic and Cultural Upliftment in Rural Environment (SECURE) and Centre for Sustainable Agriculture (CSA) State Government Initiative: Society for Elimination of Rural Poverty (SERP)
LOCATION OF THE PRACTICE	
Region	Asia
Country	India
Province, Districts, Villages	Eleven districts in the State of Andhra Pradesh
Climatic zone	From moist semi-arid to sub-humid
Other descriptive information	-
INFORMATION ABOUT THE PRACTICE	
Practice category	Managing natural resources sustainably Community empowerment
Practice type	Institutional practice for natural resource management Institutional practice for empowering rural people
Sector	Diseases and pests of animals and plants
Institutions fostering the practice	Local NGOs : Socio-Economic and Cultural Upliftment in Rural Environment (SECURE) and Centre for Sustainable Agriculture (CSA)
Beneficiaries of the practice	The communities of 11 districts
Users of the practice	Local small scale farmers (21,000 farmers)
Natural resource used or accessed (if applicable)	Natural pesticides: neem and chilli-garlic extracts

BRIEF DESCRIPTION OF THE PRACTICE	
Background/problem statement	Cotton has for many years been the major crop in Punukula, a small village in the Khammam district. It was previously grown as a monoculture, and at that time farmers used a lot of chemical pesticides to protect their crops. But frequent spraying has two serious side-effects. First of all, it did not kill all the pests, and those that survived were more likely to develop resistance to the chemicals used. The sprays then became less and less effective over time. Secondly, the sprays kill all the insects - pests as well as beneficial insects like ladybirds, dragonflies and spiders that eat the pests. Without any of these natural enemies to keep pests in check, the numbers of pests rocketed soon after the farmer sprayed the field. As a result, the farmers increased the amount of chemical in the spray, and sprayed their crops more often. This only made the problem worse and they had to spend a good deal of money just to buy chemicals. The pesticides also caused health problems. There were many cases of acute poisoning, killing people or leaving them permanently disabled and burdened with costly medical bills. Farmers also had to borrow money so they could buy pesticides. They would get credit from local dealers who sold them seeds, fertilizers and pesticides. The dealers would sell these items on credit, and then charge interest rates of 3–5% per month. The farmers were in no position to repay these loans, so would have to agree to sell their produce to the dealer. The dealer in turn would fix the price lower than the market value of the crop. The farmers were trapped in a vicious cycle of high costs, low produce prices and unpaid debts. The social stigma of being in debt, especially when the moneylender applied pressure for repayment, was unbearable for many.
Approach followed	In 1999, staff of a local non-government organization known as SECURE (Socio-Economic and Cultural Upliftment in Rural Environment) met with the villagers of Punukula to discuss problems they faced. The SECURE staff realized that problems with the use of cotton pesticides were the cause of many of the difficulties. So the organization decided to work on growing crops without pesticides in the village. Their work was supported technically and financially by the Hyderabad-based Centre for Sustainable Agriculture. A fundamental change in thinking about pest management was needed. The answer was “non-pesticidal management”: an approach that gets rid of pesticides altogether. Integrated pest management is a similar approach, but it still can use pesticides as a last resort. Non-pesticidal management uses many different practices, including the following: • Using light traps and bonfires to attract moths. • Placing yellow and white sticky boards in the field to attract and kill insects that suck out the plant’s juices. • Removing by hand leaves on which many insect eggs have been laid. • Setting pheromone traps to check on the numbers of pests in the field. • Using biological pesticides such as neem seed-kernel extracts and chilli–garlic extracts to control bollworms and sucking insects. There are also other locally available plants to make biological pesticides. • Using an extract made from cow dung and urine to control aphids and leafhoppers which also acts as a fertilizer. • Planting trap crops such as castor and marigold. Insects are likely to lay their eggs on these plants, where they can be picked off easily. The farmers were sceptical about the non-pesticidal technology at first. They were targets of persuasive marketing from the pesticide industry, so their doubts were understandable. In 2000, with a great deal of persuasion by SECURE, a group of farmers agreed to try out non-pesticidal management. Two SECURE extension workers went into the fields to show the farmers how to use the non-pesticide technologies. They made neem and chilli–garlic extracts in front of the farmers, and then showed how to apply them. The

	farmers tried using these extracts, replacing the pesticides completely. They found that they could even control cotton bollworm. By the end of the first year, the positive results were evident: farmers who had used conventional pesticides lost money, but the non-pesticide farmers made a profit. In the second year, more farmers joined in. SECURE also arranged exposure visits to other districts implementing the practice as well as training workshops. In 2003-04, the fourth year, the area under non-pesticide cotton went up to 480 ha in Punukula and neighbouring Pullaigudem villages, and covered all the cotton area of Punukula. The average yield was 3 t/ha. In 2004–5, for the second year in a row, the farmers used the alternative pest control approaches. With no debt burden, they are now willing to try out more ecological approaches, on more crops. One hundred and seventy-four farmers in Punukula, and another 120 from Pullaigudem, became experts in the new pest-management approach. They can explain to others the principles behind the approach and how they have benefited. Word has spread both spontaneously and in an organized manner. Punukula farmers themselves decided to go out to spread the message to nearby villages. Everyone who visits the village hears about the transformation.
Innovative elements	The village Panchayat council passed a resolution stating that the village was pesticide-free, and would continue to be so. The Panchayat requested pesticide dealers not to come to the village to market their products. The village farmers were able to pay back past debts in a couple of years.
Impacts on natural resource base	Actual: The ecological balance in the fields has been restored. There are many more insects in the fields that do not reach a “pest” stage of threat.
Impacts on livelihood of the practice users	Actual: The workers are no longer exposed to pesticides, and have no medical expenses for pesticide-related illnesses. The health of the farmers has improved, and there have been no more cases of acute pesticide poisoning from the village. Farmers are renting land and growing crops over a larger area, creating jobs for farm workers in the village. Wages have gone up.
Other impacts	Actual: The state Minister for Agriculture visited Punukula and was convinced by the approach. As a result of such activities, the state-run Society for Elimination of Rural Poverty (SERP) decided to scale up non-pesticide management in 11 districts in Andhra Pradesh from 2005–6 onwards. It is collaborating with CSA and its partner NGOs in this programme. The programme is the first massive effort to wean people from pesticides and to promote non-chemical, environmentally friendly, local-resource-based approaches to farming. The SERP/CSA programme includes various aspects: Mass campaign: A state-level campaign on the problems of pesticides and alternative pest controls with posters, films and *kalajathas* (traditional folk media). Establishing field experience: Interested farmers sign an agreement stating they will collect at least 60 kg of neem seed, will not apply any synthetic pesticides, will attend all the training programmes, maintain a farm observation book, and will pay for input costs either directly or as a loan. In each districts, experienced NGOs were identified and are associated with the programme. Institutional arrangements: At the village level, farmer field schools (or similar bodies) were set up with interested farmers. District-level monitoring teams and a state-level support team to oversee the programme. Equity concerns: While selecting farmers, it is mandatory that 90% should be small-scale and marginal farmers. Training: Intensive orientation, training, monitoring and communication activities take place at different stages during the crop’s growth. Suitable

	communication materials are being developed. The results of the initial stages are encouraging. Non-pesticide management has been successfully established in all 11 districts. These districts include major pesticide users such as Guntur, Warangal, Kurnool, Khammam and Karimnagar. The technical capacities of 62 mandal-level (block-level) resource teams and 11 district-level monitoring teams have been increased. Over 450 farmer field schools composed of interested farmers have been set up. Up to 21,000 farmers have participated in these field schools. A cadre of at least 200 farmer resource persons has been trained; their task is to facilitate farmer-to-farmer training and extension. Initial estimates indicate that in the first year alone, farmers saved Rs 60 million on pesticides, equivalent to the amount spent on the project. With larger areas and more farmers coming into the programme, the savings will be higher.
General success factors	Within the practice: a) **Visible positive effects**: The farmers were exasperated by the problems they were facing before the implementation of the practice. The practice has effects that are quickly visible in terms of farm economics, health and the environment once it is fully implemented. The effectiveness of alternative pest management techniques can be shown on demonstration plots. The potential financial savings and reduced health hazards are obvious. This contributed to very positive and far reaching recommendations by word-of-mouth. Demonstration of impact to local and national authorities, organization of exposure visits and training workshops. b) **Autonomy of farmers**: The practice eliminates the dependency of farmers on the "all-in-one dealer" and therefore reduces "debt trap" problems. This practice has the potential of enabling farmers to maintain the full production cycle under their control. c) **Support from elders**: The elders of the village, who enjoy a good deal of respect from younger villagers, advocated this practice since they still remember how farming was done before the green revolution. d) **Culturally acceptable**: The practice is culturally acceptable (due to the fact that it actually is a traditional farming method) and does not raise any social issues or evoke any social challenges. It is rather the opposite: farmers, once having adopted the practice, are very enthusiastic about it and participate strongly in the scaling up process by inviting farmers and representatives from a wide range of development institutions to their village and telling them about their experiences with the practice. e) **Cultural adequateness**: There has been a long tradition of collective decision making in the target area. This contributed to the success of the project since it is essential that this practice be implemented jointly at the community level. f) **Replicability**: The practice is easy to replicate since the only input needed is the know-how. This can be disseminated by farmers. Some villages have already replicated the practice without the help of an NGO. g) **Product quality**: The Cotton Association of India (CCA) rated the NPM cotton as a 1st class product and offered a premium price. However, the market is far away, and packaging and transportation are expensive. h) **Increasing effectiveness with increasing number of participants**: The more widely NPM is applied, the more effective it becomes due to the restoration of a naturally balanced ecosystem. The more farmers adopt this practice in a certain area, the fewer inputs, like neem, are needed and the cheaper the implementation of the practice will become. Within the organisation: a) **Credibility**: CSA is a well established NGO with a history of success stories and has built up a very good reputation over the years. This enabled CSA to become one of the key players in policy consultancy which reinforces their efforts in dissemination of NPM. b) **Size**: CSA is a small NGO with only 16 staff (12 scientists, 2 administration staff, 2 support staff). CSA is deliberately trying to keep its number of staff below 20 to keep bureaucracy at a minimum and stay as

	flexible as possible. c) **Publicity**: The village of Punukula, CSA and the practice itself received a lot of publicity due to the great achievements of the project. Many farmers, politicians and development workers are visiting Punukula. A State-level campaign has created widespread awareness about the potential health risks of pesticides and the potential alternatives. d) **Networking**: CSA has a strong and extensive network, with 30 implementing NGOs and other institutions, which leaves them with enough room to concentrate on lobbying work etc. They also benefit from the local knowledge of the NGOs and do not have to set up institutions in the target areas since they can use the existing structures of the local NGOs and help develop a network. e) **Knowledge**: CSA has extensive knowledge of the way the government and public administration works and can therefore act appropriately. On the other hand, CSA also has a deep understanding of the social structures and problems within villages. f) **Powerful allies**: CSA lobbied the State Minister of Agriculture successfully to promote NPM and he then became one of the biggest advocates of the practice. However, his department still has close relations to trade and industry. Outside the organisation: a) **Strict enforcement**: In Punukula the village council passed a resolution that anybody who does not act in accordance with the practice of NPM would be fined since this would negatively affect neighbouring farmers. b) **Support from State Bank**: The State Bank of India has come forward to support this practice. It developed a micro-credit model which can be used by the farmers through women's groups and will be launched this year (2006).
Technology success factors	Address farmer needs, priorities and management Maintain or increase biodiversity No adverse environmental effects, preventing erosion and improving soil fertility
Institutional success factors	Farmers' capacity for adoption of the technology Institutional support and outreach
Problems remaining to be resolved	**Lack of knowledge about seed production**: Seeds are still bought on the market but their quality is often low. If farmers could produce their own seed there would be less dependency on traders and the industry. **All in one dealer:** The problems with accumulated debts with the "all-in-one dealer" are damping the effects of the practice. Many farmers still have to sell their products to this dealer to repay their debts. The low prices given by the dealer keep farmers from reaping the full benefits of NPM. **Political inconsistencies**: There is an inconsistency in policy making and public administration concerning the government's stance on NPM. **Access to finance**: So far, it has been difficult for farmers to take out loans from anybody else but the local all-in-one dealer. **Market Access**: Although good marketing opportunities exist (e.g. selling to the CCA which offered a premium price) they are not used due to a lack of cooperation and organisation amongst farmers. Profitable marketing is also aggravated by a lack of infrastructure, extension systems, marketing information and expertise. **Community-wide application**: The practice needs to be applied community wide to tap its full potential. This requires a high degree of organisation in the village and often takes a long period of time to be adopted by all community members. **Biomass**: To minimise the dependencies on outside inputs, biomass should replace synthetic fertilisers. The biomass availability is a bottleneck. CSA provides livestock management trainings to promote livestock production.

	Limited resources: The most hindering factor are the limited resources of CSA and its implementing NGOs. There is need for more finance to set up more demonstration fields, conduct exposure visits and field trips.
Keywords	Biodiversity, biological control, capacity building, crop production, crops, disease control, education, empowerment, environment, environmental management, farm management, fertilizers, insect control, insect disease, integrated pest management, pest control, pesticides, pests, plant disease control, plant protection, technology transfer, training.
Potentials and Opportunities for Up-scaling	Potentially, all small scale farmers in India could adopt this technology, although the practice has to be adapted to local conditions in every case. Scaling-up activities: a) **Training of trainers**: CSA is not working with farmers directly but has a network of established NGOs who implement the project in different areas. CSA is providing the necessary support and training to these NGOs and therefore keeps its resources free to concentrate on lobbying and developing the practice further. b) **Lobbying and political scaling up**: CSA and its associated NGOs will try to involve the government more in the dissemination of the practice by lobbying them to expand their program and support for the practice. CSA will do so on state level while the implementing NGOs will concentrate on the local level. One of the major successes of CSA was the launching of the government programme, which is also supported by the World Bank and implements and disseminates the NPM approach. When a governmental commission looked into the crisis in agriculture CSA approached the commission and gave a presentation about the debt trap and suicide problem as well as about the NPM practice which offered a good solution. The commissioner showed an interest and visited Punukula, where CSA could demonstrate the potential of NPM. At the same time CSA filed a complaint with the Human Rights Commission drawing attention to the mentioned problems and lobbied the government to consider their approach in the policy making process. Pressured in such a way, the government initiated the programme as a livelihood programme under the administration of the Department for Rural Development in June 2005 in 450 villages, covering 23,000 acres in 10 districts. In a recent review the government and the World Bank recognised the savings-potential and ecological benefits of NPM. With regards to improving the marketing opportunities the Department for Rural Development employed 250 business professionals to train women in marketing in some villages as a separate programme. As a result, auctions were introduced in the villages to which a number of traders are invited. The farmers agreed in advance on a minimum price below which no one would be able to sell. This opened up new marketing channels through formally unavailable agents and increased competition amongst the buyers of their products. c) **Demonstration and training**: CSA is conducting training for farmers and other NGOs. Punukula is regularly visited by farmers and NGOs, who have heard about the practice and became interested in it. This awareness building and training component is an important part of CSA's scaling up strategy. d) **Media**: CSA has experienced a substantial amount of media coverage and found it to be very supportive and effective in disseminating the idea behind the practice. It will further try to receive this public attention. e) **Seed banks and local seed propagation**: Getting the whole production cycle under the control of the farmers will improve the effectiveness of NPM. Seed banks could help to break the trader-farmer linkages on the input side. Most of crops seed production, except for hybrid cotton, can be carried out on farm level. f) **Initial provision of inputs**: To get the practice started CSA's implementing NGO provided neem at market cost to the farmers. The

	neem only had to be paid for if the farmers were satisfied by the results. After having provided the neem for 2 years, a campaign was carried out in the village of Punukula, to warn farmers they had to start cultivating the neem in their fields. g) **Creating local input markets**: CSA is trying to create and promote production systems and local markets for biological pesticides. They are analysing the profitability and viability of neem processing units. The objective again is to make the farmer as independent from external players as possible. h) **Micro-credit**: The State Bank of India has developed a micro-credit system which will be launched this June (2006) in the target area. This will contribute immensely to the further success of the project. Women SHGs are trained on financial issues. These women's groups can take out loans and manage the finances. Farmers who want to use these institutions have to be members of these groups. This development is promoted and supported by CSA. i) **NGO demonstration plots**: If the implementing NGOs had their own demonstration plots or farms it would make convincing farmers of the benefits of this practice easier. j) **Making the practice available to large farmers**: A way of scaling up the practice is to make it useful and available to large scale farmers as well. CSA is investigating whether it would become more attractive to large farmers when the labourers would not only spray but also produce the sprays. Small processing units for neem etc., would have to be established which might lower the cost of inputs on these farms enough that the practice would become a profitable alternative regardless of the higher labour input. k) **Promoting livestock to overcome biomass bottleneck**: A livestock management centre will be introduced to tackle the problem of the lack of biomass by promoting livestock production. l) **Documentation**: To support its awareness building campaigns and to promote an understanding of the practice, CSA is collecting data and documenting every application of NPM. m) **Networking**: CSA encourages its partner organisations to form partnerships with other NGOs and invite them into the network.