Self-reliant farming for food security and sovereignty, Maharashtra, 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 Chetana Email: chetana@nagpur.dot.net.in
Useful links	Sustainet www.sustainet.org
INFORMATION ABOUT THE PROGRAMME OR PROJECT PROMOTING THE PRACTICE (IF APPLICABLE)	
Programme or project	-
Time frame	1999-2005
Donor	-
Implementer of the programme or project	Local NGO: Chetana-Vikas
LOCATION OF THE PRACTICE	
Region	Asia
Country	India
Province, Districts, Villages	Wardha District, State of Maharashtra
Climatic zone	Moist semi-arid
Other descriptive information	Average rainfall 800-1000 mm but restricted to only 4 months from June to September. Maximum temperature 47 °C in the month of May, with relative humidity as low as 5-10% for 4-10 weeks
INFORMATION ABOUT THE PRACTICE	
Practice category	Managing natural resources sustainably
Practice type	Technology for improving farm productivity sustainably
Sector	Crop production system management
Institutions fostering the practice	Local NGO: Alternative Agriculture Resource Centre of Chetana-Vikas
Beneficiaries of the practice	Small scale farmers and their families
Users of the practice	Small scale farmers
Natural resource used or accessed (if applicable)	Soil, rainwater, seeds
BRIEF DESCRIPTION OF THE PRACTICE	
Background/problem statement	In the last few years, income in the agricultural sector in India has been constantly falling. Remuneration to the human-resource input of farmers and farm entrepreneurs is consistently going down. Thousands of farmers who have been pushed into a vicious cycle of increasing indebtedness have killed themselves as a last resort out of desperation. Cultivation of cotton, for example, often involves high inputs of seeds, pesticides and fertilizers for which farmers have to take loans. When this is coupled with low yields or unfair/low prices for the produce, farmers fall into debt which they cannot repay. In general, market prices for agro-produce are dwindling in contrast to rising cost of agricultural inputs and general inflation. The situation is only

	expected to worsen in the coming years as the global free trade policy forces markets open to cheaper and cheaper commodities.
Approach followed	The Alternative Agriculture Resource Centre (AARC) of Chetana-Vikas, a non-governmental development organization, developed a strategic approach to make both farming and the farmer self-reliant. The agricultural model they promoted was based on low external inputs (e.g. seeds, fertilizers, pesticides and fungicides, equipment and machinery) and high internal regeneration of inputs. This model also provided a resilient agro-ecosystem with inbuilt resistance against seasonal adversities and provided the family with enough food to meet their dietary requirements. The model was developed for land units of 1-2 hectares under rain-fed conditions which previously cultivated cotton. The strategy of focusing on cash crops only, such as cotton, proved to be too precarious for small farmers. The new model used a combination of cash crops and food crops to diversify the farmers' food sources and achieve nutritional security. As the harvest period in the area only lasts 6-8 months, food security requires the planting of several crops. The new approach built on farmer's traditional knowledge: some varieties of local indigenous seeds were selected and soil fertility was managed through companion cropping and crop rotations. **Methodology** To calculate the average annual family food consumption and food expenditure of small farmers in the Wardha District of the state of Maharashtra, 15 small farmers and their families were selected from 10 villages and asked to list out their daily consumption of food and also their average expenditure on non-food items (such as clothes, education, medicine and travel among others). On the basis of this information, it was found that the annual budget of these small farmer families amounted broadly to Rs 25000, about 50% of which was used for food needs and 50% for non-food needs. Out of the 41 food crops consumed by the farmer families in a year, 33 (80%) can be grown on dryland without requiring irrigation. They included 3 different cereals, 7 different pulses, 17 different vegetables, 4 different spices, soybean, and pigeon pea. **Research at AARD on cropping systems** Between 35-40 crops were intercropped and rotated on the basis of the type of land available, slope and availability of sunlight. The positioning of crops in each hectare was managed in such a way that a number of appropriate and interrelated companion crops were planted together to develop all at once through synergistic relationships. The only external, but locally available input, was farmyard manure (not compost). The traditional seed varieties obtained from interior regions were field-tested for various important parameters such as yield potential, pest and disease resistance and also taste. Only those varieties which showed positive results on all the above parameters were selected for further propagation among farmers. **Implementation of the new sustainable farm model** The implementation of the new farm model started by raising awareness among farmers in the village community. Farmers visited demonstration plots of traditional seed varieties and received 4-5 days training using appropriate seeds provided at reasonable costs. To ensure soil and water conservation in the fields, contour bunds were built using the farmers' own family labour and with the aid of rented bullocks. These structures proved to be essential in the provision of moisture security during times of erratic rainfall, allowing crops to overcome dry spells of even 35-40 days. This process was followed by 1 or 2 visits by AARC staff, along with discussions to analyse and evaluate different farmers' experiences. No separate financial support was given apart from the cost of training, facilitation and peer group field visits. As a result, the practice of mono-cropping cotton was replaced by multiple cropping. Farmers started cultivating between 6-25 different crops and experienced benefits from the first year: one ha of land which used to produce 800 Kg of cotton with conventional chemical farming was able to produce 700 Kg of

cash crops comprising cotton, soybean and pigeon peas, and 755 Kg of food crops. Farmers also incurred low expenses and did not make use of any loans. Hence this strategic farm model helped poor farmers escape the debt trap, poverty, and improve their food and nutritional security.

Innovative elements

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Impacts on natural resource base

Actual: The texture and fertility of soil is improved; it was not devoid of moisture during dry spells. The number of earthworms increased.

The availability of water increased, even in times of erratic rainfall, due to the creation of contour bunds.

Impacts on livelihood of the practice users

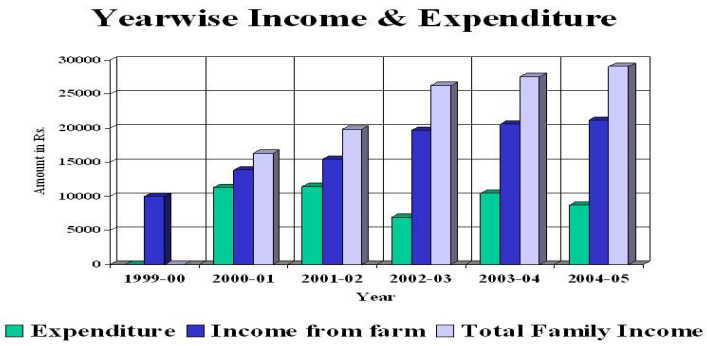
Actual: The net income of the farmer families has steadily increased since the project began. In this model with very high crop diversity, 38 of the 41 crops consumed as food can be grown on dry land. Thus the farmers became practically self-reliant in food crops. However many other food crops that are now consumed but were not included in the initial list of foods are also produced, giving farmers a very high level of food and nutritional security. Additionally, cash earnings by the farmer families increased by 87%.

Achieved self reliance:

Food and non-food items	Farmer family needs (Kg)	Production from 1 ha (Kg)	Achieved self-reliance
Cereals (excluding wheat)[1]	302	125	41%
Pulses	80	300	375%
Vegetables (monsoon season)	27	9	33%
Spices	50	63	126%
Oil seed (for 50 l oil)	120	120	100%
Other necessary small food items	10	18	180%
Cash (obtained from the sale of cash crops and fodder, plus external wages)	Rs 12,263	Rs 10,686	87%

[1]Cereals: Wheat needs irrigation; therefore a dryland farmer will have to buy wheat from the market. For the rest of the cereals like sorghum, pearl millet, maize etc. self reliance could be achieved in this dry land area.

Cash: The cash crop cotton occupies only 0.5 hectare out of the 1 ha land.



Other impacts

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General success factors

The model was researched and developed bearing in mind the constraints that the majority of these farmers face, i.e. totally rain-fed dry land without sources of irrigation, ordinary land with medium soil quality, small holding size of about 1-2 hectares, few resources like tools, equipment, manure and cattle, absence or scarcity of labour, little capital. After trials in the farms, this

	model has been found to be suitable for the majority of these farmers who farm dry land.
Technology success factors	Increase farm production and / or stabilize it Address farmers needs, priorities and management
Institutional success factors	-
Problems remaining to be resolved	The quantity of farmyard manure needs to be increased because the amount applied by a small farmer is very inadequate. Similarly, a more comprehensive and optimized system for making soil nutrients available should be researched as well as a better method for recycling biomass in dry land farming. These improvements could also increase production of cash crops.
Keywords	Agricultural development, Agriculture, Arid soils, Conservation, Cropping, systems, Crop production, Crops, Dry farming, Erosion, Erosion control, Farming systems, Fertilizers, Food production, Food resources, Household consumption, Intercropping, Mixed cropping, Multiple cropping, Natural, resources management, Nutrition, Rain fed farming, Resource conservation, Seed, Soil conservation, Soil fertility, Water conservation