# Biodiversity based Sustainable Agriculture, in Uttaranchal, 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, held in India |
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| Useful links | [www.sustainet.org](http://www.sustainet.org); [www.navdanya.org](http://www.navdanya.org) |

## INFORMATION ABOUT THE PROGRAMME OR PROJECT PROMOTING THE PRACTICE (IF APPLICABLE)

| Programme or project | Navdanya’s Biodiversity based Sustainable Agriculture Programme |
| Time frame | 1995 - ongoing |
| Donor | Government of Germany |

## LOCATION OF THE PRACTICE

| Region | Asia |
| Country | India |
| Province, Districts, Villages | Dheradun and Garhwal, State of Uttaranchal |
| Climatic zone | From sub-humid to dry semi-arid |

## INFORMATION ABOUT THE PRACTICE

| Practice category | Managing natural resources sustainably |
| Practice type | Institutional practice for natural resource management  
Institutional practice for improving farm productivity sustainably  
Institutional practice for enhancing household livelihoods sustainably |
| Sector | Sustainable natural resources management |
| Institutions fostering the practice | Local NGO: Navdanya |
| Beneficiaries of the practice | Small scale farmers |
| Users of the practice | Small scale farmers |
| Natural resource used or accessed (if applicable) | Land, seed varieties, cow dung manure, compost and plant based pesticides |

## BRIEF DESCRIPTION OF THE PRACTICE

| Background/problem statement | The major concerns of the farmers in the region of Dheradun and Garhwal are a reduction of the productivity of the land and the storage of the cash crops (onion, potato, ginger, radish, garlic and turmeric). Farmers were forced to sell their crops especially onions and potato to the market immediately after harvesting, because of their reduced shelf life. |
After starting conventional farming, farmers were able to get good prices at the market, but with the time, their profit margin started decreasing every year. The storing time for the crops also started reducing every year with the increased use of fertilizers.

**Approach followed**

Navdanya is an organization who supports interested farmers to convert to organic farming. It works with the holistic philosophy of biodiversity conservation and sustainable agriculture. Navdanya considers it essential to re-introduction of traditional varieties (like millets and pseudo-cereals) used in earlier times, because they contained a high nutritional value and were adapted to the local conditions, but today have these traditional varieties have almost disappeared.

Navdanya started its activities with a participatory consultation with local farmers in order to identify their main problems; pest control, crop storage, erosion of genetic diversity and extinction of seed varieties were recognized as major threats to peoples’ food security and survival. With the aim of facilitating and supporting the replication and adoption of organic agriculture, few innovative farmers were selected to start the program. Time to time training on different techniques of organic farming (composting techniques, pest and disease management, selection of seeds and post harvest management) was given to every selected farmer using local plants. Old farmers were also invited as resource persons for the training programme. Farmers were encouraged to share experience with other farmers during training as well as during meetings. Progress of the selected farmers was monitored regularly, and solutions and suggestions were provided to them in every stage of cultivation. Farmers were advised to start the sustainable agriculture practices on a small piece of land for confidence building.

Some farmers from different villages started to cultivate onion on a rather small piece of land, after Navdanya’s assurance to compensate for any kind of loss in the yield. According to the instructions given by Navdanya, these farmers stopped using any kind of chemical fertilizers and used only ash, cow dung and urine. All of them had satisfactory yield. They were asked to hold the crop to see the shelf life. It was proved that they were able to keep these onions for a much longer period of time, and thus they could sell them for a higher price when market price went up.

Exposure tours to the successful farmers’ fields were also important for the promotion of organic farming. This encouraged other farmers to start experimenting with organic methods in their fields. Organic farming was subsequently adapted to other crops and within three years some hundred other farmers converted to organic agriculture. Some of the fertilizer shops (cooperative) even had to close, as the demand went down. Farmers who had shifted to organic agriculture also started to collect seeds from their harvest for the next year. Traditional and almost forgotten practices of farming were recalled and applied, including methodologies to store the harvest and methods of traditional pest control. Also, almost forgotten old varieties of foods and seeds were reintroduced. Now more than 45 villages in the region are totally chemical free and are using eco-friendly traditional techniques which proved to work for centuries in India.

The key resources that allowed small and marginal farmers to take control over the project are seed and biodiversity. Industrial farming was leading to erosion of biodiversity and loss of control over and access to seed. These trends have been reversed by Navdanya’s intervention. Biodiversity based organic farming also ensured food security throughout the year, whereas with chemical farming of cash crops, food insecurity was growing. The practice is implemented in over 2100 villages nationwide.

In addition to the above activities, other are now undertaken by the NGO:

- **Community Seed Bank:**
  Navdanya has collected, registered and conserved more than 2,500 different rice varieties. Farmers are supported to select and store different varieties of the crops produced in the villages;

- **Community Biodiversity Register (CBRs) and organized groups:**
**Navdanya** collected and documented the available indigenous knowledge on insects, plants, animals living in the area. Any information which was considered to be relevant to sustainable agriculture was written down (e.g. medicine, pest control, species requirements for environmental conditions);

- Marketing (Fair trade) initiative for organic products;
- Education on biodiversity and food for school children

### Innovative elements

Unlike many other NGOs working in India in the field of sustainable agriculture, Navdanya is working on three different levels:

- Navdanya carries out a program on field level, where specific agricultural problems are identified and analysed together with the farmers;
- the NGO then takes these problems to the research section, where options for solutions are developed and tested;
- problems which are beyond the local level, for example the case of “biopiracy” of the fungicidal properties of the neem plant, are taken up to an international court level. Other general problems, such as the controversy which is going on about GMOs, are managed by Navdanya through awareness building and advocacy for preservation of indigenous seeds at national and international level.

### Impacts on natural resource base

**Actual:** Organic farming changed the situation in just three years by making organic farming profitable with negligible or rare external inputs.

### Impacts on livelihood of the practice users

**Actual:** Promotion of traditional multiple cropping systems instead of monoculture resulted in increased biodiversity. The intensification of biodiversity translates into higher productivity, reduced risk of crop failure and increased nutritional value of food. Daily working hours were also reduced.

Farmers have minimized the dependency on external inputs. They are conserving their own seeds, preparing their own compost and pesticide. They are encouraged to grow plants, which can be used as fodder, for pest control and also for making compost.

Farmers were able to save money by selling their surplus products. Their purchasing power has also improved, and as a result (?) they now have telephone, television and some of them also have their own vehicles.

### Other impacts

**Actual:** Declaration by the state government to make Uttaranchal an organic state is also a big success and help for Navdanya movement.

### General success factors

- Navdanya encouraged farmers to make optimum use of locally available resources, material and techniques. Use of traditional utensils for agriculture works and storage as well as use of locally available biological material for disease and pest management (extract of plants, cow urine, buttermilk etc) is encouraged.

- Availability of seeds within the area and Navdanya’s seed banks in similar agro-climatic zones are internal fostering factors.

- A partial intervention does not address all the problems faced by small and marginal farmers in all project areas, therefore Navdanya raised farmers’ awareness on the issues of biodiverse organic farming, seed sovereignty and food sovereignty, in all project areas. Awareness of policy issues was generated through organizing protest march, rally, seminars, workshops, signature campaigns and public hearings on the issues. A memorandum was submitted to the district, state and federal government on the issue. This demonstrates that a significant impact can be achieved when working at different level of outreach.

- To scale-up the impact, Navdanya trained on organic farming and biodiversity conservation, several women organizations and large groups like Yuvacharya of Art of Living, who are presently working in about 5000 villages of India.
| Technology success factors | Improve quality and nutritional value  
Increase farm production and/or stabilizes it  
Maintain or increase biodiversity |
|----------------------------|------------------------------------------------------------------|
| Institutional success factors | Farmer's capacity for adoption of the technology.  
Institutional support and outreach. |
| Problems remaining to be resolved | Convincing the farmers in new areas were they are already using extensive chemical fertilizers and pesticides is quite difficult because various government and private agencies distribute to the farmers free seeds, fertilizers and pesticides along with monitoring help. Another hampering factor is the shift of government policies to corporate farming, which is further marginalizing small farmers.  
Time required to conversion to organic is a major issue, since it is observed that in the first two years of transition phase, productivity goes down between 15-20 %. In the worst conditions the loss may go up to 40 % in terms of yield, but in most cases the loss in yield is compensated by the money saved on inputs. |
| Keywords | Agriculture, biodiversity, biological control, capacity building, compost, cropping system, crop production, diversification, environment, environmental management, extension activities, fertilizers, genetic resources, germplasm, germplasm conservation, natural resource conservation, natural resource management, organic agriculture, organic compounds, organic production, participatory approaches, pest control, pesticides, pests, plant disease control, plant protection, public awareness, seed, soil fertility, storage, technology transfer, yield. |
| Potentials and Opportunities for Up-scaling | Navdanya believes this practice could be implemented in all farming systems throughout the country.  
Potentials and Opportunities:  
a) **Reputation**: Navdanya has a well-known chairperson, Dr. V. Shiva, who enjoys international recognition for her research in organic farming and development.  
b) **Repeatability**: The practice can be altered to fit any agro-geographic zone using local knowledge.  
c) **Exit strategy**: A practice that will run self-sufficiently after a certain period of time and therefore provides an implicit exit strategy. This frees resources that can be applied in other areas to introduce the practice.  
d) **Visible effect**: There was a visible effect in terms of health, biodiversity and income, which doubled or, in some cases, tripled. This contributes to a quick replication and dissemination of the practice.  
e) **Labour input**: No significant change in labour requirement has been noted by Navdanya on small farms that have switched to organic. A lot of the extra work is compensated for by a reduction in labour requirements for other farm activities (e.g. weeding requires more labour than before, but since the weeds can serve as a fodder for cattle less labour has to be invested in fodder production).  
f) **Little investment**: To start the practice little or no investment is needed on farm level. Therefore more farmers are able to adopt the practice once they were convinced by it.  
g) **Reduced risk**: Organic farming doesn’t implicate higher risks (e.g. of crop failures or more fluctuating markets) than conventional. It sometimes even reduces risks, since it reduces monocultures and, therefore, the devastating effects of a failure of one crop.  
h) **Market potential**: Organic products have a great market potential since they can gain a premium price. The organic market is growing constantly in India and abroad.  
i) **Self sufficiency**: Organic farming makes farmers independent from external inputs and from fluctuating input prices. Farmers are not subject to the arbitrariness of multinational companies who supply agricultural inputs. Organic farming is a low cost production system, which has the potential to produce at least the same amount of yield which can be sold at at least the same price as conventional products. |
j) **Cooperation with farmers unions and other institutions:** Navdanya has a relationship with several farmers unions. Additionally, Navdanya has an extensive network with other NGOs and organisations working in the development sector. There is a mutual exchange of experience and this network helps Navdanya to reach as many farmers as possible with their ideas.

k) **Geographical coverage:** Navdanya covers most of India. The NGO has offices in many cities throughout the country and established networks with a number of other institutions. This helps Navdanya to take its ideas into many different states and reach farmers in various parts of India.

**Constrains:**

a) **Difficulty to convince the farmers:** It has proven to be difficult to convince farmers of the potential of organic farming. Due to the fact that farmers have been carrying out conventional farming for over one generation now, farmers were sceptical towards systems not using pesticides at all and were afraid that this would cause a loss in yield or bear high risks of crop failure.

b) **Conversion period:** In the first year after switching to organic the farmer has to expect a 50% reduction in income and will take up to 4 years to reach the original level again. This can make it difficult for some farmers, especially the very poor, to adopt this practice.

c) **Legal framework:** The legislative framework is still promoting conventional farming and discriminating against organic farmers. The economic benefits of organic farming become less visible where conventional farming is subsidised and therefore kept at an artificial level of profitability.

d) **Certification:** Farmers adopting organic production methods in India have difficulties to get certification. On the one hand this certification is expensive so that it is difficult for farmers to get certified due to lack of capital. The high cost of certification hinders a further penetration of international markets where higher profits could be obtained. On the other hand farmers have difficulties complying with the standards of certified organic production, especially when these require high cost initial investment.

e) **Opposition in trade and industry:** There are a number of institutions that have a strong interest in conserving the status quo. Traders and producers of agrochemicals see their markets endangered and therefore put a lot of effort into discrediting organic farming by carrying out anti-organic campaigns. Even threats against farmers and NGO staff have been reported.

f) **Complexity:** Organic farming is a production system that requires a detailed understanding of various aspects of agriculture and the organic production cycle. Most farmers lack this knowledge due to the fact that they have carried out conventional farming all their life. They have to be motivated to learn about the method and skilful and experienced trainers are required to transfer this knowledge.

g) **Lack of consumer awareness:** To date many consumers in India are not aware of the benefits of organic food in terms of quality and taste, health aspects and environmental benefits.

h) **Difficulties to add value:** Due to high investments and the need for marketing expertise and cooperation of farmers, it becomes difficult for farmers to add value. However, value adding would bear the potential of increased returns, and would therefore make the practice more profitable.

i) **Subsidies:** State governments in India advantage conventional farming systems for example by subsidising inputs. Additionally in many states farmers have to comply with certain good practice standards if they want to take out loans from banks. These standards are conventional standards and organic farmers are rejected access to finance.

**Scaling up activities undertaken by Navdanya**

a) **Consumer network:** Navdanya offers its associated farmers to buy their products and market them. It is building strong customer relations by
having established a direct marketing system with shops in Delhi and Derahdun and a consumer network where members pay a premium price for Navdanya’s products. In this network members pay 20% more, of which half goes to the farmer and the other half covers the transport. Non-members who shop at Navdanya’s outlets pay additional 10% which is kept as a profit and reinvested in implementing the practice. Additionally there is a Fair Trade marketing channel to Germany and Italy.

b) **Processing**: To provide the opportunity for small farmers to engage in value adding activities Navdanya provides interest-free credits to SHGs to invest in small processing units.

c) **Awareness building**: By increasing media coverage on their organisation and approach, Navdanya will create awareness amongst consumer for the benefits of organic products in terms of taste, health, the environment and social aspects. It will furthermore create awareness amongst farmers for the dangers of conventional farming. Navdanya is thinking of ways of increasing their appearance in the media for example by inviting camera teams and journalists. To do so a Navdanya staff could be trained in PR or a PR professional could be employed.

d) **Certification**: Navdanya is trying to find ways of making certification accessible to farmers by providing a cheap certification. So far their attempts have failed due to a lack of capital and skilled workforce. Navdanya would like to investigate whether there might be an opportunity in joining forces with other NGOs in an effort to establish a nationwide recognised certification system. This certification, as long as it aims at the national market only, would not have to be a full certification in the sense of existing organic certifications. It could start by certifying certain characteristics of the production method like sustainability, poverty reduction or pesticides free.

e) **Lobbying**: Navdanya will continue putting effort into lobbying for a fair legal framework. As long as political institutions favour conventional farming, organic production methods will disseminate more slowly and show understated results.

f) **Training and supply of inputs**: To reach as many farmers as possible Navdanya provides the necessary training to the farmers for free and, if possible, on site i.e. in the villages. It has shown that demonstration plots are of great importance in this process of awareness building.

g) Since, according to Navdanya’s philosophy, organic farming goes hand in hand with the use of indigenous seeds (which are conserved at seed banks) farmers need to be able to access these seeds. There are three ways this can be done. First of all, seeds can be taken from the seed bank as a form of loan which has to be repayed after the harvest. Secondly, farmers could trade the seeds with each other, and thirdly, farmers can be given a certain amount of seed which they don’t have to repay but instead pass on the same amount of seed to two other farmers.

h) **Exit strategy**: Navdanya views an exit strategy as essential for up-scaling. A certain region should be independent from any inputs and support from the NGO after a while and run their system in a sustainable way. Navdanya can then shift its resources to other geographical areas and introduce the practice there.

**Additional notes:**
So far Navdanya has put relatively little emphasis on the economic dimension of the project. Although there is some data about average changes in income since the introduction of the practice, none of the interviewed farmers could say whether their economic situation improved or worsened. Putting more emphasis on the economics would help to point out the bottlenecks and to identify the limiting factors.