

Meet a Vermicomposter from Ganadulu Village

Development Alternatives (DA) launched a [vermicomposting project](#) in [Tumkur District](#), Karnataka in mid 1996. The project was part of a larger programme on sustainable agriculture but it had the additional target of helping underprivileged rural women develop micro-enterprises. Today, 25 women have created sustainable livelihoods through vermicomposting.

"We were very poor..."

Farida Banu of Ganadulu village was among the first participants. Farida set up a vermicomposting enterprise in her parents backyard. She regularly harvests close to 400 kg of vermicompost every month. Farida, a 30 year old Muslim, from a family of agricultural labourers, tells her story...

Recalling her childhood she says, "We were very poor and I had to go and work in somebody's house to earn something for the family... I also wanted to go to school and learn like others. But it was not possible as we were very poor and had no way other than working as labourers. I could not go to school and also work as a coolie [labourer]."

Before starting vermicomposting, Farida used to prepare agarbatti sticks (incense). She recalls, "I used to prepare around 1000 sticks a day and get Rs 25. When I first started doing this I used to get Rs 2.50 a day for doing the same



work... In those days the prices were low and the wages were also low. We could manage with whatever we earned as wages in those days. But today the prices are exorbitant. Even earning so much more, it is hard to save even Rs 10 a day."

"Those were very hard days," Farida says. "We did not have enough for anything. If somebody wore good clothes or made a feast, we used think about the possibility of our family getting these things. We started working harder and harder every day and earning more and more wages to fulfill our dreams of getting a better life."

Despite the hurdles, Farida was determined to progress. She says, "We were very poor. But we also wanted to live a good life like our neighbors. That is why we decided to work harder as labourers and come up in life."

Social Context

"My parents got me married with force. I was not happy at all even for a day as it was a forceful marriage against my wishes."

Like many women, marriage did little to improve Farida's life. She recalls, "I got married 10 years ago when I was 20. I was not interested in that marriage. But my parents got me married with force. I was not happy at all even for a day as it was a forceful marriage against my wishes... My husband also used to live in our house... My husband became an alcoholic and never heeded to my repeated requests of leaving that habit. He refused to work as a labourer and [ignored] my advice of working hard and living a good life. He used to always waste his time in accusing me of not having

Meet a Vermicomposter from Boranakanive Village

"I had to work in somebody's house as a labourer to earn my living."

Shardamma is a forty year old woman from the village Boranakanive. She is a Hindu in the Vokkaliga caste. Shardamma's parents worked as labourers and from a young age Shardamma joined them. She said, "my father had passed away when I was till very young. I had to work in somebody's house as a labourer to earn my living."

Social Context

"I alone had to earn and feed the family."

Like most girls in the area, Shardamma's family arranged her marriage at a young age. She recalls, "I married at fifteen and entered my husbands home. Here also I had to earn my living by working as a coolie [labourer]." Shardamma has three children, two boys and a girl.

Recalling the beginning of her married life she says, "When I married, my husband was not working. I alone had to earn and feed the family. I used to get Rs 2 per day as wages. I was not getting work regularly. I used to collect cow dung and sell dung cakes to earn our livelihood." "Later," she says, "I worked for six months of the year as a labourer. I can earn Rs 20 per day. This is the rate for female labourers. My son earns Rs 30 per day. This is the rate for male labourers. We would work for three or four days in a week."



"A few years back," Shardamma says, "I got a loan from the bank and purchased a buffalo. The bank had given us two loans each worth Rs 3000. We cleared our bank loan six months ago. I decided to buy a buffalo because it is easy to rear a buffalo in comparison with sheep and we get more dung with a buffalo."

Like most village families one of the biggest economic hurdles Shardamma faces is paying her daughters dowry. Again, like most families, her only option was to take a loan. She says, "We took Rs 40 000. We will clear the rest of the loan in two years. We borrowed the money from large farmers and the bank."

Project Beginnings

"We did not expect people to come and buy vermicompost. We did not expect that this would happen, but we started selling it to people who wanted to try."

When DA approached Shardamma to join the [vermicomposting project](#) she says, "I had not been aware of such an enterprise earlier. But we thought that we should give it a try." Describing the process she says, "They [DA] put in the vermicomposting pit and we created a shade for it and collected biomass (green leaves) and dung."

Like many of the entrepreneurs Shardamma had some difficulties in the

Vermicomposting Project

Development Alternatives (DA) launched a vermicomposting project in Tumkur, District, Karnataka State, in mid 1996. [Background work in the region](#) had revealed the need for enhancing the income earning capacity of women, as well as promoting natural resource management and sustainable farming. The project was initiated with support from the Council for Advancement of People's Action and Rural Technology (CAPART).

The primary objective of the project is:

- to help women set up micro-enterprises based on vermiculture technology, in rural and peri-urban areas of Tumkur, to improve their economic and social status.

The secondary objectives include:

- improving soil fertility and food productivity through ecological methods of farming, including organic nutrient recycling.
- improving village cleanliness by promoting the use of waste recycling (thus reducing the amount of waste strewn in the village).

Background on the Region

A group of villages in Chikkanayakanahalli (CNHalli) Taluk were selected for the first stage of the project. The main source of livelihoods in CNHalli are agriculture, horticulture and animal husbandry. Land holdings are very meager and agriculture practices are, in general, poor. The area has very low rainfall, averaging 400mm per year. Agriculture is almost totally rainfed and land development is poor. Marginal farmers and the landless migrate to other rural and urban areas in search of work. There is a large population of backward communities. Women are uneducated, under-employed and have limited access to resources.

The Project Process

At the project onset, a permanent three compartment breeder unit was constructed at the DA Appropriate Technology Center in Tumkur. Earthworms of two species, *Eisenia foetida* and *Eudrilus eugeniae*, were introduced into cow dung and local organic matter (leaves, grasses, etc.).

Ashok Kumar, is the head of the vermicomposting project. He recalls, "We started by setting up a breeder unit and training our field staff how to do vermicomposting. I gave the staff all of the information they needed and then I let them do the composting. There was one problem. I noticed right away that they had set up the unit perfectly except they had forgotten the sacking (to cover the worms). I let them wonder for a few weeks before I told them that the one thing they had forgotten was the cover. First I wanted them to try to figure it out themselves. I believe people must learn by doing."

Once the DA field staff were experienced in vermiculture the project began in earnest. In the first phase of the project fourteen entrepreneurs from the rural areas of Hoyisallakatte, Ganadulu and Dasudi gram panchayat (lowest level of self-governance) were selected for enterprise development. The first orientation and training programmes were conducted in October and November 1996. Ashok explains the process, "Our goal was to train and set up 25 enterprises for vermicomposting. When we first started trying to get villagers involved there was an attitude or feeling among villagers that we "city folks" had nothing useful to tell them. We started with 45 or 50 in the training because we knew many would not stay through the entire programme. Ten people dropped out on the first day. By the end of the first week only 12 women were left."

The training lasted two months and covered aspects of vermiculture and vermicomposting. The women were also trained in micro-enterprise management including basic accounting and literacy. A stipend of Rs 300 was paid to each entrepreneur every month during the period of training.

[Training aids and materials](#) were prepared (in English and Kannada, the local language), including:

- posters and charts covering vermicomposting
- charts covering subjects such as sanitation, sustainable development, and women's economic empowerment
- a teaching aid on organic wastes, and vermicomposting

The vermiculture units were constructed near the homes of the participants. The earthworms were distributed from Development Alternatives' breeder unit. Initially, 500 adult earth worms were distributed to each entrepreneur. Later, this was increased to between 2000 and 3000 earthworms.

Before introducing the earth worms, all of the units were filled with three week old cowdung or fodder. Some of the entrepreneurs had problems with breeding the worms in the beginning. Ashok says, "The main problem in the beginning was that the women were not confident enough to handle the earthworms. Some women lost their earthworms because they didn't understand the compost cycle. Women forced the worms into the feed (manure, fodder etc.) before it was ready rather than putting a pile of the worms on top and letting them work their way down when the feed material was suitably decomposed." This was corrected by constant visits and supervision by the motivators.

Later, larger units were constructed for vermicomposting and the first units became decomposing tanks. The larger tanks can produce up to 800 kgs of vermicompost per month. Mesh covers were provided to protect the earthworms from predators.

Effectively marketing the produce was critical for the success of the enterprises. The training programme covered topics on marketing, product and pricing, differences with chemical fertilisers and farmyard manure, cost effectiveness, etc.

Awareness was created in local communities through demonstration plots. Vermicompost was applied to sections of farmers fields while other areas received chemical fertilisers or manure. The demonstrations were on local crops including mulberry, groundnut, ragi, and vegetables. The plants receiving vermicompost showed luxuriant and healthy growth compared with other fertilisers.

Ashok recalls, "In the beginning the women didn't think anyone would pay for something like vermicompost but from the start they were able to get 3.5 Rs per kilo for it."

Marketing efforts paid off. People started to buy the product. One example is a farmer from Hangalavadi village who has taken vermicompost to mix with onion seeds for sowing, replacing the need for sand. In another case, the Range Forest Officer in CNHalli has been buying vermicompost for his tree nursery.

DA also applied vermicompost to 250,000 saplings in their own nursery. The growth of the plants is fast and healthy and the leaves have turned dark green. Resistance to pests and diseases is also high.

Interest in organic farming and sustainable agriculture is growing in the region. Many of the women are successfully marketing the vermicompost while others are using it on their own fields. All of the vermicomposting units are working now. As Ashok said, "We wanted a 100% success rate and that is what we got."

Phase Two

With the first phase of the project running successfully DA continued into a second phase targeting peri-urban areas. The areas selected for enterprise development were Bukkapatna town of Sira taluk and Huliya town of CNHalli taluk. Eleven entrepreneurs were selected from Huliya and Bukkapatna and are now running successful units.

Ten self-help groups have been formed in the villages, which among other things disseminate appropriate technologies for enterprise development. These groups have also been motivated to start small savings programmes, allowing members to take loans for setting up enterprise units. Each group meets once in a month.

Phase Three

Nineteen enterprises using ferrocement tanks were set up with the balance amount in the villages of Hoyisalakatte, Dasudi and Thimmanahalli gram panchayats, by November 1998 while one unit was kept at the DA field office as a demonstration unit.

A [manual](#) titled 'do-it-yourself', in English and Kannada has been prepared for dissemination.

The vermicomposting project was completed at the end of 1998.

The project has revealed:

- The demand for the training on vermicomposting is high in the rural areas which indicates its potential for enterprise development.
- There is demand for the vermicompost in both rural and urban areas which is a reflection on the growing awareness of people at large on the harmful effects of chemically grown food.
- The women have shown good potential in running the enterprises and have proven themselves capable of marketing the vermicompost and earning their livelihoods on a sustainable basis.
- The empowerment of women has the potential to bring about social change; the women's self help groups show keen interest in community action.

The first stage in the vermicomposting project comes to an end this year. Buoyed by their success in the project DA is planning to have 150 to 200 more units established shortly. The longer term goal is to have 2000-3000 units in the region by December 1999.

In the next stage, DA is offering different schemes to villagers. In one scheme, DA will invest partly in setting up an enterprise (total cost of Rs 2000). The total cost includes training, earthworms and structure. In another scheme, DA will provide the training and earthworms; the farmers build their own structures. In both schemes DA pledges to buy back a part of the compost if the participant wishes. However, many of the participants want to use the compost on their own farms. DA encourages this local use. Ideally DA would like 95% of the compost to stay in the area.

Ashok Kumar sums up the project saying, "the vermicomposting project is very easy to replicate. It is cheap and requires no great expertise." The concept of sustainable livelihoods, he says, "often doesn't include the sector of people who need the most help. That is the farming community. If we talk about farming we are talking about 920 million people in India." By his definition, sustainable livelihoods are "things that need very little external help or input (whether financial or knowledge). They bring confidence and self reliance, independence, dignity and meaning. They are also ethical livelihoods - they meet real needs, such as meeting the need for food security."

People Involved in the Project

- Mr. Shantha Kumar, Field Resource Scientist
- Mr. G.V. Raghu, Field Resource Scientist
- Ms. Bhuvanewari, Motivator
- Mr. Hanumantharayappa, Motivator
- Ms. Antoinette Kavita Paul, Design of training materials
- Mr. Nagaraj, Motivator
- Mr. C.Ashok Kumar, Co-ordinator
- Ms. Chaya Chengappa, Resource Scientist
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For More Information

Several articles from [Development Alternatives' newsletter](#) are available online. More information about vermicomposting is available from:

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Vermicomposting Training Manual

The following manual is a modified version of a training tool used in DA's vermicomposting project.

What is Vermicompost?

Put simply, vermicompost is the castings of earthworms. Organic waste gets decomposed by micro-organisms and is consumed by earth worms. The castings of these worms is popularly known as vermicompost.

Vermicompost can be prepared easily. The essentials are space, cowdung, organic wastes, and *epigeic phytophagous* earthworms. Vermicompost is a good organic manure as it improves soil quality. Conversely, over time, inorganic fertilisers can deprive the soil of fertility.

Sources of organic waste for manure production:

The organic wastes that are available in agricultural areas include cattle dung, sheep dropping, biogas slurry, stubble from harvested crops, husks and corn shells, weeds, kitchen waste etc. All these materials can be used to produce vermicompost.

Requirements

- **Housing:** Sheltered culturing of worms is recommended to protect the worms from excessive sunlight and rain. All the entrepreneurs have set up their units in vacant cowsheds, poultry sheds, basements and back yards.
- **Containers:** Cement tanks were constructed. These were separated in half by a dividing wall. Another set of tanks were also constructed for preliminary decomposition.
- **Bedding and feeding materials:** During the beginning of the enterprises, most women used cowdung in order to breed sufficient numbers of earthworms. Once they have large populations, they can start using all kinds of organic waste. Half of the entrepreneurs have now reached populations of 12,000 to 15,000 adult earthworms.

Process

The bedding and feeding materials are mixed, watered and allowed to ferment for about two to three weeks in the cement tanks. During this period the material is overturned 3 or 4 times to bring down the temperature and to assist in uniform decomposition. When the material becomes quite soft, it is transferred to the culture containers and worms ranging from a few days to a few weeks old are introduced into them.

A container of 1 metre by 1 metre by 0.3 metres, holds about 30-40 kgs of the bedding and feeding materials. In such a container, 1000 - 1500 worms are required for processing the materials. The material should have 40 to 50 percent moisture, a Ph of 6.3 to 7.5, and a temperature range of 20 to 30 degree celsius.

The earthworms live in the deeper layers of the material. They actively feed and deposit granular castings on the surface of the material. The worms should be allowed to feed on the material until it is converted into a highly granular mass.

The earthworms take 7 weeks to reach adulthood. From the 8th week onwards they deposit cocoons. One mature worm can produce two cocoons per week. Each cocoon produces 3-7 young after an incubation period of 5-10 days depending on the species of worms, quality of feed, and general conditions. The resulting increase is about 1200-1500 worms per year. The

population doubles in about a months time.

Harvesting of Vermicompost

The harvesting of vermicompost involves the manual separation of worms from the castings. For this purpose, the contents of the containers are dumped on the ground in the form of a mound and allowed to stand for a few hours. Most of the worms move to the bottom of the mound to avoid light. The worms collect at the bottom in the form of a ball. At this stage, the vermicompost is removed to get the worms. The worms are collected for new culture beds. The vermicompost collected is dried, passed through a 3 mm sieve to recover the cocoons, young worms, and unconsumed organic material. The cocoons and young worms are used for seeding the new culture beds. The vermicompost recovered is rich in macro-nutrients, microbes such as *actinomyces* and nitrogen fixers, and is used as a manure.

Pests and Predators

Earth worms have a large number of predators, including: birds, fowl, rodents, frogs, toads, snakes, ants, leeches, and flat worms such as *bipalium*. To avoid attacks of these predators vermiculture should be practised in protected places.

Benefits

By establishing vermiculture units entrepreneurs can recycle their own resources and create an effective fertiliser in the process. The extra worms that are produced can be used as feed for poultry and fish. The advantages of this technology include:

1. Recycling of organic wastes.
2. Production of energy rich resources.
3. Reduction of environmental pollution.
4. Provision of job opportunities for women and jobless people.
5. Improvement of soil pH. (vermicompost acts as a buffering agent).
6. Improvement in the percolation property of clay soils (from the compost's granular nature).
7. Improvement of the water holding capacity in sandy soils.
8. Release of exchangeable and available forms of nutrients.
9. Increase of oxidizable carbon levels, improving the base exchange capacity of the soil.
10. Improvement of the nitrate and phosphate levels.
11. Encouragement of plant root system growth.
12. Improvement in the size and girth of plant stems.
13. Early and profuse plant flowering
14. Creation of a substitute protein in poultry and fish feed.

One disadvantage of this technology is that pesticides and heavy metals accumulate in the bodies of the worms that are raised on contaminated organic wastes. If such worms are used as protein source in animal feeds, health hazards may result.

Also:

[Meet a Vermicomposter from Ganadulu Village](#) | [Meet a Vermicomposter from Boranakanive Village](#) | [Vermicomposting Project](#) |

Vermicomposting Training Manual | [DA Activities in Tumkur District](#)