# Riding high

Farmers of Andhra Pradesh are prospering after learning to grow crops without costly pesticides. The vegetables they supply to towns and cities are a big hit with consumers who are happy to part with a few rupees more to buy them. SAVVY SOUMYA MISRA travelled to Hyderabad and six other districts to report the non-pesticidal management (NPM) farming revolution sweeping across the state

Ajith Kumar, an Air India executive posted in Hyderabad rarely lingers to chat with colleagues during lunch hours. Instead, he rushes off to the agricultural cooperative store next to his office to buy farm fresh vegetables grown without pesticides.

The Hyderabad Agriculture Cooperative Association (HACA) store located at the posh Hillfort Road locality where Kumar works is the only government outlet in the city that sells pesticide free vegetables. Fresh stocks brought in every day fly off the shelves within two hours. This explains why Kumar and other professionals like him as well as housewives living in the nearby residential areas rush to the store as soon as the vegetables arrive.

"My wife calls me on the phone to make sure that I leave office in time to buy vegetables. I don't mind the extra effort. These vegetables are very fresh and taste much better," said Kumar while waiting in queue outside the HACA store.

Vegetables grown through non-pesticidal management or NPM are tickling the taste buds of other Hyderabadis too. "The vegetables sold at the cooperative store cost two rupees more than those available in the market. I don't mind paying the extra price as these taste better," said Altaz Naseer Muniza, another customer.

Earlier NPM vegetables were available in just one private upmarket store *24 Lettered Mantra* in Jubilee Hills, where the cost was double the procurement price, said Kruppakar Reddy, the HACA store in-charge. He said ever since his store started selling pesticide free vegetables, the demand had been going up. "Right now there is only one farmer who is supplying us NPM vegetables. We plan to provide him with exclusive space in the building. Refrigerated storage space will be given to other farmers as well," Reddy said.

NPM vegetables are gaining popularity in the small towns too through *rythu bazaars* where farmers sell their produce directly. The *rythu bazaar* in Kadapa district's Chinta Komadini mandal has three stalls where farmers sell NPM vegetables and other products like paddy and chilli powder for a premium. "The farmers bring their stocks at seven in the morning thrice a week and everything gets sold off within an hour. Teachers, small businessmen

***Top: People crowd around vegetables sold at the HACA store in Hyderabad.; (bottom) Ajith Kumar buys vegetables from HACA***

PHOTOGRAPHS: MEETA AHLAWAT/CSE

***None of the 3,000 NPM villages of Andhra Pradesh registered a single suicide death in 2007***

and government officials are among the clients," said Venkat Brahman, the district project manager of Society for Elimination of Rural Poverty (SERP), established by the rural development ministry for implementing the NPM programme. The project is on in 18 of the 23 districts of Andhra Pradesh.

## Changing fortunes

*Down to Earth* traced the NPM vegetables at the HACA to Srinivas Reddy, a 25-year-old farmer of Manchal village, Manchal Mandal, located 50 kilometres from Hyderabad. Srinivas has been growing vegetables without pesticides for the past one year. It has been five months since he started supplying pesticide free tomatoes, okra, brinjals, gooseberries, chillies and leafy vegetables to the HACA store. "The demand is very high and other farmers too are taking cue from me and switching to NPM farming," he said.

Farmers realized that pesticides only added to the cost of cultivation and did not check pests that had become resistant to pesticides. (*Down to Earth* in its issue of May 31, 2006 had carried a report titled 'Out of the trap' on how pecuniary considerations were motivating farmers to abandon use of pesticides and switch to NPM farming which is the entry level exercise for adapting to organic farming methods). Discontinuing the use of pesticides made no difference to yields. Thus, growing pesticide free vegetables cut costs and made farming profitable. Srinivas, for instance, used to earn just Rs 1,200 a month by selling vegetables to HACA store. Now he is raking in Rs 4,500 a month which is almost four times more.

In the three years since the trend was first reported, NPM has become a way of life with Andhra farmers and those in related trades. Twenty seven-year-old Krishna Reddy of Todalapalle village in Kadapa district is a case in point. From a fertilizer and pesticide dealer, he became a dealer in natural products made from neem and other herbal ingredients used to control pests and improve soil fertility. Krishna now sells neem powder, seeds and pheromone traps (for luring and trapping pests) among other things to the villagers.

"Eighty per cent of the farmers in my village had stopped using pesticides and asked me to keep bio-products. Though my earnings from the shop have gone down from Rs 10,000 to Rs 8000, I am able to cover up the deficit by selling my own farm products grown without pesticides," Krishna said.

NPM farming has provided an opportunity to women to become entrepreneurs. Many women have set up shops selling bio-products used for NPM farming. K Keija, a 30-year-old mother of two, set up her own NPM shop in her village, Kondapatturu in Guntur, two years ago. She earns upto Rs 3000 profit from the shop by selling bio-formulations like *ghanajeevastra, neemastra* and *brahmastra* that she prepares manually by sourcing raw material locally. Now she can afford the treatment for her polio stricken daughter. "My husband works as a farm labourer and earns very little. I could

## The NPM primer

### What is NPM?

**Non-pesticidal management or NPM does away with the use of any synthetic pesticide in agriculture. Instead, various home made concoctions made from neem, garlic, chillies, plant and herb extracts, cow dung and cow urine are used. Pheromone traps that lure pests and other traditional methods of pest control are used.**

### How does NPM saves costs?

**Use of pesticides has proved to be ineffective in controlling pests and makes agriculture unprofitable. Use of natural pest control methods cuts the cost of cultivation drastically. Farmers can save Rs 2,500 to Rs 5,000 per acre by stopping pesticide use. The crop yields without pesticides are the same and fetch better prices. Thus farmers earn more by investing less.**

### How is it different from organic farming?

**NPM is the first step towards organic farming. It does away with the use of chemical pesticides while organic farming does away the use of chemical fertilizers, growth enhancers and genetically modified (GM) organisms as well. Organic farming relies on use of green manure, compost and crop rotation or intercropping to enhance soil fertility. It also allows friendly weeds and insects to grow.**

## The beginning

**Agriculturists working in the public sector came together in 1986 to form Centre for World Solidarity, a non-profit, to solve the problem of the red hairy caterpillar ruining the red gram crop. After a series of crop specific tests, scientists recommended that pesticides were not required and coined the term NPM.**

**SERP took the programme forward with World Bank aid. Rural credit was given to women self-help groups. This scheme was called Velugu and was later re-named Indira Kranthi Patham.**

**The scheme has now been expanded to cover 3.4 lakh farmers**

## Fillip to food security

*T Vijay Kumar, the chief executive of SERP, on how NPM has evolved into a farmers' movement. Pesticide free harvest is netting bumper profits for farmers*

**What changes have you seen in NPM since 2005?**

**It has expanded beyond our own expectations. We started with just 400 acres . This year our outreach will be 14 lakh acres. What is remarkable is that the programme is completely owned by the farmers and women SHGs.**

**Can decline in suicide deaths be attributed to NPM success?**

**Suicides are a complex phenomenon. What we can say is that there is a lot of distress in agriculture. With farmers following NPM, we have seen a significant reduction in distress. They have been able to reduce costs, withstand price cuts better and improve their health.**

**What are you looking at next – exports or farmer sustainability?**

**For commercial crops like chillies, cotton and vegetables, it is important to look at bigger markets. But we recommend that farmers move away from mono cropping because commercial crops are susceptible to price fluctuations. We would like them to reduce risks and then explore the bigger markets. All options are open; farmers will decide.**

**Critics of NPM say that it will create a food security problem. What is your take?**

**It is not true. On the contrary, crop production will go up. Inter cropping yields diverse cereals, adequate fodder and fuel wood. There are crops that mature at different times of the year, so in a way we are staggering the flow of income for the farmer. Small and marginal farmers will become producers of grains. There will be greater food security once NPM is applied to fallow land.**

not take our daughter to the government hospital in Guntur for treatment earlier, but now I can afford her treatment," Keija said.

Khairunnisa Begum of Vattam village, Mahboobnagar district, set up a shop to promote the cause of NPM farming. "I give my products free to poor and needy farmers," the 45-year-old entrepreneur said. She now plans to expand her business by setting up two more shops in nearby villages. Khairunnisa was a treasurer of the area women self help group (SHG) called 'Mahila Samakhyam.' These SHGs are training farmers to set up NPM stores. At present there are 300 NPM shops across the state.

NPM farming has benefited from the centrally administered National Rural Employment Guarantee Scheme (NREGS) after the two were dovetailed by the state administration. The scheme facilitated NPM cultivation by employing labourers to dig farm ponds for irrigation.

G Subbalakshmi, a 40-year-old farmer from Chhinnarasupalli village of Chhinnamandem mandal had no irrigation facility till about seven months ago. She was cultivating dry land paddy and other crops that use very little water. After a farm pond was dug in her field under the NREGS, she sowed paddy on her 1.4 acre plot. Simultaneously, she stopped using pesticides. "From 10 bags of paddy last year, my yield is likely to go up to 25 bags this year. I have also saved Rs 2,500 by not using pesticides," Subbalakshmi said. Now she is planning to take up pisciculture to augment her income.

Ramachandrapuram village in Khammam district was the first village in the state to introduce employment guarantee scheme in fields under NPM cultivation. The works taken up under the scheme included digging of farm ponds, making compost pits, land development and removing silt from dried water tanks and ponds that can be used for improving soil nutrients. Other villages like Punnukula, Mulukallapalle and Vepakoyyaramavaram, in Warrangal district, soon followed suit.

According to D V Raidu, the state project advisor for NPM, digging of farm ponds helped farmers irrigate their fields and recharge ground water. "About 400 farm ponds were dug in Nizamabad district and as a result of it, ground water levels rose by 4.5 metres in Ellareddy mandal," Raidu said, adding that work orders to the tune of Rs 6.76 crores had been executed and funds totalling Rs 2.44 crores had been disbursed.

### Decline in suicide deaths

In the decade preceding NPM, about 3,000 farmers killed themselves because of high cost of cultivation, according to Centre for World Solidarity (CWS), a non-profit formed by a team of public sector agriculturalists who started the NPM movement. "Things have changed now. There has not been a single suicide in any of the 3,000 NPM villages," said G V Ramajaneyulu, executive director of Centre for Sustainable Agriculture, a branch of cws.

Farmers said debt drove many cultivators to suicide. "Women used to fear that their husbands or sons would consume pesticides. But now, even if they want to, they will only get to drink insect repellants made from cow dung and urine," said Khairunnisa, the NPM shop owner of Vattam village.

Conventional farming that used heavy doses of pesticides and fertilizers was a major health hazard and entailed numerous visits to the hospital. "Most farmers complained of giddiness, skin problems, breathlessness and burning sensation in the eyes while spraying

***A villager sets a pheromone trap to catch pests in Vattam village***


*Chemical pesticide advertisements on trees in Guntur*

pesticides. Some even had to be admitted in hospitals for treatment," said P Lalitha of Chittapur village in Manchal mandal. Her family's health improved after use of pesticides was stopped. "Our visits to the hospital have ceased altogether," she said.

Sixty-year-old Doodakule Ghousia, another resident of Chittapur village, said her husband used to complain of stomach problems, nausea and restlessness when pesticides were being used. "At times he would get fits. During the spraying season. We had to go to the hospital every other day and each visit used to cost Rs 500. Now that has stopped," Ghousia said.

As per official figures for Ramachandrapuram village in Khammam district, there were nine serious hospitalization cases due to spraying of pesticides between 1994 and 2003. Other farmers too constantly complained of headaches, itching, dizziness and eye problems. All that is history now.

NPM farming has helped Lalitha re-enrol her children in school. She had to withdraw her three children from school after she suffered heavy losses in agriculture. Lalitha said she earned Rs 30,000 from paddy and Rs 20,000 from vegetables in the year 2007 after her cost of cultivation went down and so she is able to afford good education for her children. Almost all farmers *Down To Earth* spoke to in the districts of Warrangal, Khammam, Mahbubnagar, Guntur, Kadapa and Ranga Reddy said they could now afford better education for their children, thanks to NPM.

***300 farmers of Guntur district have formed a cooperative to market their NPM products***

## Finding markets

Farmers are earning bigger profits by selling their NPM vegetables and grains in the *rythu bazaars* and other markets. Technology is also being used to popularize NPM. Videoconferencing with SERP officials to share information, mobile phone messaging and group mail IDs are being used for networking and information.

The state administration is still trying to figure out market linkages to help the farmers sell their produce. Farmers of Guntur district have been able to tap the market by forming a farmer's co-operative society with the help of a local non-profit named Rakshana. Over 300 farmers owning 600 acres of NPM fields have joined the cooperative that will decide the prices and also process products like chillies before selling them to earn more profit.

The SERP is discussing certification of NPM products with Ghaziabad based National Centre of Organic Farming under a participatory guarantee scheme (PGS) that will help reduce the certification cost per farmer.

T Sudhakar, assistant general manager of the Hyderabad branch of the Agricultural and Processed Food Products Export Development Authority (APEDA) said PGS certification will not help to market NPM produce internationally. He added that big Indian companies and multi-nationals that have entered the food retail market can help market NPM and organic produce of farmers. APEDA is the accrediting agency and secretariat for all organic products.

Raidu, however, said PGS certification is enough as the aim of the project is to make farming sustainable and make chemical free vegetables available locally. "I feel certification is not required. But we at SERP do not mind certification under PGS just to prove a point," he said.

Once certification procedure is streamlined, it will not be long before vegetable vendors and local markets start selling pesticide free vegetables.

# No pesticides no debts

Enabavi and Ramachandrapuram broke away from conventional farming and have transformed. Other villages are gaining from their experience

*Left: Lakshmi and her husband M Rajulu were the first in Ramachandrapuram to take up NPM; Right: Ponnam Mallaiah, a farmer from Enabavi village, prepares compost for his fields*

A board with bold letters announces the chemical free and GM free status of Enabavi village in Warrangal district. The village, a 10 kilometres from Hyderabad, stopped using pesticides 10 years ago and adopted organic farming methods five years later, much before the state administration decided to officially recognize NPM.

Enabavi with 280 acres of farmland managed by 52 families has now become a learning centre for neighbouring villages. It has also become a mandatory stop over for members of non-profits, ministers, planning commission members and international organizations keen to gain first hand knowledge of how organic farming is changing lives for the better. Enabavi made news in Delhi last month at the Indian Organic Trade Fair organized at PUSA Institute where Enabavi rice packets sold like hot cakes.

In 2003, there were two types of farmers in Enabavi: those who followed conventional farming methods and others who practised organic farming. The yields of both groups were the same, but those who followed organic farming methods were earning a few thousand more as they were not using pesticides. Since then, all farmers have abandoned conventional farming methods.

The fields in the village look unkempt as friendly weeds are allowed to grow. "Now we don't spray bio-pesticides as there are no pests," said Ponnam Mallaiah, 60-year-old farmer who owns 20 acres of land. He grows paddy, red gram, sesame, tobacco and vegetables on his plot.

The villagers used natural repellants for just the initial two years. After that pest attacks stopped, said Narasamma, Mallaiah's sister. "We have also stopped using urea as it makes the plants grow faster and succulent, which attracts pests. They are now tackled by friendly insects. Organic farming has created a balance between friendly and harmful pests," she said.

Twenty-year-old Ettaboina Mahender said, only natural fertilizers are used. "Cow dung, cow urine and vermicompost is used while preparing the soil for cultivation." Demand for cow manure in turn has led to villagers increasing their cattle livestock. "Now we use cattle for ploughing and have stopped using machinery," he said.


*Organic farming has Enabavi villagers smiling again*

Farmers use azolla, a fern-like plant, as a fertilizer in their paddy fields. "Azolla spreads very rapidly and works as urea. It helps to suppress harmful weeds. Panchagavya, prepared by combining cow dung, urine, milk, ghee and curd, is used as a growth enhancer. It improves the taste, colour and texture of vegetables and fruits," Mallaiah said.

The villagers ensure seed quality through mutually beneficial arrangements. The farmers who grow good quality grains are offered incentives for preserving their harvest as seed.

"A farmer gets Rs 900 for a quintal of paddy. If his grain quality is good, he is asked to keep the yield as seeds for the next season and offered Rs 1,200 per quintal," Narasamma said. This saves money as buying seeds from the market would cost Rs 2,000 per quintal.

One of the driving forces behind Enabavi's success story is R Lingaiah, secretary of Centre for Rural Operation Programmes Society, a non-profit. The village has become famous in the neighbouring districts and people travel miles to buy Enabavi produce, Lingaiah said.

"Agriculture in Enabavi has become zero budget after organic farming methods were adopted. The only costs incurred by the farmers are on labour and transportation of manure," he added.

Organic farming has helped the villagers repay their debts. "If the farmers had continued using chemicals, their debts would never have got cleared," Narasamma said.

These days Enabavi is playing host to farmers of neighbouring Kallem village who are learning organic farming methods.

All visitors to Enabavai are now expected to post their comments in the visitors' book maintained by Mahender, the village spokesperson.

## Mortgaged land freed

Well kept kitchen gardens, *pucca* houses and clean streets dotted with *rangolis* (floral decorations made with rice powder) greet visitors in Ramachandrapuram village, Khammam district.

In our earlier report in 2006, it was reported how villagers of Ramachandrapuram, belonging to Koya tribe, had begun redeeming their mortgaged land after switching over to NPM. Since then, the villagers have managed to redeem all their mortgaged land and have now acquired 22 acres of land on lease from neighbouring districts to expand their agriculture.

Ramachandrapuram has 305 acres of farmland and nearly half of it (147.5 acres) was mortgaged in 2005. The farmers were caught in the fertilizer-pesticide debt trap after their cotton yields started going down. Most of them ended up mortgaging their land with the moneylender who was also the local dealer for pesticides and fertilizers.

"Within two years of switching to NPM farming, the villagers were able to free their mortgaged land," said Lakshmi, who along with her husband M Rajulu, was the first couple to take up NPM. Lakshmi is the coordinator of the

***Agriculture in Enabavi has become zero budget after villagers took to organic farming***

## Natural pest control

**Farmers experimenting with traditional methods of crop protection came up with varying versions of NPM. Most farmers are using inter-cropping to control pests, improve soil fertility and make farming profitable and sustainable all year round.**

**Krishna Reddy, a 62-year-old retired teacher of Edirepalle Village in Thimmajipet Mandal uses the 36 feet by 36 feet model evolved by natural farming expert Subhash Palekar. Reddy grows varieties of millets, grams, groundnut, castor, jowar, bajra and vegetables together. The pulses increase nitrogen content in the soil. Marigold and sunflowers are grown as trap crops for attracting insects and pests and preventing crop damage. They trap common pests like fruit and shoot borers.**

**In Vattam village, Bijnepalle mandal, Khwaja Aamir Ali has further refined the model by growing vegetables and fruits with less water. He watered his 25-acre plot only twice this year. In Manchal mandal, a women's SHG has cultivated a field with 29 varieties of vegetables and pulses. The SERP and the horticulture department have facilitated these vegetable farm models. Farmers are provided seed kits at 90 per cent subsidy.**

**As for pesticides, they have been substituted with pheromone traps. The pheromone traps lure male pests and trap them in a funnel shaped contraption. Four pheromone traps costing Rs 100 are enough for an acre.**

**The bio-products used in place of pesticides have neem as the common ingredient. These can be prepared at home and have been named neemastra, agniastra and brahmastra. Annasuryamma, a 45-year-old farmer of Barravaripalem village in Prathipadu mandal of Guntur district made her own pest control concoction by fermenting nandivardanam flowers which saved her chilli crop from leaf miners.**

**Some bio-products are used as fertilizers. The most common is ghanajeevastra, made from cow dung, cow urine, jaggery, gram flour and chemical free clay.**

## Comparative profits

From chemical and organic farming

| | Jillela Yella Reddy, farmer, Kallem Village, Warrangal. Uses pesticides and fertilizer: | Ponnam Mallaiah, farmer, Enabavi village, Warrangal. Uses organic farming methods. |
|---|---|---|
| Investment on cotton crop on one acre | Rs 15,250 | Rs 8, 550 |
| Total yield | 12 quintals | 10 quintals |
| Total gross income | Rs 24,600 | Rs 22,000 |
| Net income | Rs 9,350 | Rs 13,450 |

## Farmers' redemption

Mortgaged lands taken back due to NPM

| Name of the district | Mortgaged 2004 (before NPM) Acres | Redeemed 2005 Acres | 2006 Acres | 2007 Acres | Total |
|---|---|---|---|---|---|
| Srikakulam | 29.8 | — | — | 29.8 | 29.8 |
| Visakhapatnam | 88.5 | 3 | 34 | 39 | 76 |
| Khammam | 147.5 | 62 | 85.5 | — | 147.5 |
| Total | 265.8 | 63 | 119.5 | 68.8 | 251.3 |

## Fruits get organic tag

*Gopal Mehta, president of Himachal Organic Farmers' Forum (HOFF) spoke to Down To Earth on how organic farming has become popular with orchard owners of Himachal Pradesh, who are now growing apples, plums and apricots without using pesticides or fertilizers*

**When and why was HOFF formed?**

The Forum was formed eight months ago with the help of the state agriculture university and the agriculture department that have been actively promoting organic farming.

**What is the strength of the Forum?**

The Forum has about 7,000 farmers who together own 1000 hectares of land across the state. We are concentrating on growing and marketing organic vegetables and fruits like apples, lichees, almonds, plums, apricots and mangoes. As many as 56 farmers have obtained organic certification for their produce and another 2,200 will get certification in about a month's time. The farmers have to pay just Rs 1,000 each as certification charges.

**Were the farmers open to the idea of adopting organic farming methods?**

The farmers have been very enthusiastic about shifting to organic farming. There have been instances when members of the pesticide lobby have tried to dissuade farmers from shifting to organic farming. But farmers are determined to go ahead with the change.

**How have farmers benefited from organic farming?**

By shifting to organic farming, farmers have been able to save 80 per cent of the cost of cultivation. Their yields have also increased. For example, 100 apples grown by using pesticides and fertilizers, weigh 20 kgs while the same number of apples grown through organic farming, weigh 24 kgs. The fruits have more flesh and taste better. They also remain fresh for a longer period. The farmers are able to get better prices and are making profits. Soil fertility too has improved in the orchards across the state.

**Are you exporting organic fruits? Have you decided on a brand name?**

We have not thought of exporting as yet. India itself has a big market. We have not even started exporting to other states.

We plan to market our produce under the brand name of HOFF. The brand should be out in the market by next April.

Durga Mahila Samakhya, one of the women SHGs in the village. The SHG has managed to access funds at lower interest rates through the District Rural Development Agency. "We have paid back most of the loans and are now trying to identify markets for our produce," Lakshmi said.

Rajulu has been recognized as the best farmer in the district for growing high yielding non-Bt cotton using NPM method. "I have managed to grow eight to 10 quintals of cotton along with a quintal of green gram and 15 kgs of pulses and millet in just one acre of land," he said. Rajulu expects to net Rs 15,000 on an investment of just Rs 1,500. His paddy yield has also gone up to 18 quintals per acre as against six quintals an acre when he was using pesticides.

The villagers have also started inter-cropping wherein many crops are grown on the same patch of land. Pulses, millets, sesame and vegetables are grown together. "The farmers now know that inter-cropping is good for the soil, sustainable and profitable," said Shyam Sunder Reddy, district project manager for NPM.

The farmers of this village now send their children to private schools for education. Lakshmi's son, Ramesh Babu, is the first postgraduate in the village.

Ramachandrapuram has been nominated this year for the 'change makers' award given out by Citibank to non-profits financial initiatives. ■