

## The seeds of sustainability

In early June, Andhra Pradesh Chief Minister N. Chandrababu Naidu announced that the State would **fully embrace Zero Budget Natural Farming (ZBNF)**, a chemical-free method that would cover all farmers by 2024. Earlier in the year, he had revealed these plans at the meeting of the World Economic Forum in Davos.

Even though this revolution has been in the works for several years, this is still a momentous occasion and highlights the way to improve the welfare of farmers, reduce the cost of farm inputs, cut toxins in food, and improve soils. With successful pilot programmes that were initiated in 2015 and partners who brought experience in different aspects needed to carry out such a transformation, Andhra Pradesh has become the first State to implement a ZBNF policy.

According to Rythu Sadhikara Samstha, the agency that is implementing the ZBNF, the programme will be extended in phases. This year, 5 lakh farmers will be covered, and at least one panchayat in each of the mandals will be shifted to this new method, bringing the programme to a tipping point. By 2021-22, the programme is to be implemented in every panchayat, with full coverage by 2024.

Natural farming only solution : Naidu

Towards this end, substantial resource mobilisation for about 16,500 crore is in progress. Tenant farmers and day labourers are also being trained, to ensure that through the ZBNF, livelihoods for the rural poor will be enhanced. T. Vijay Kumar, a retired civil servant in charge of implementing the programme, views farmer-to-farmer connections as vital to its success. According to him, the role of the Agriculture Department is to just listen to farmers and motivate and assist them in different ways. Farmer's collectives such as Farmer Producer Organisations need to be established and these would be critical to sustaining the programme. The Government of India provides funding through the Rashtriya Krishi Vikas Yojana and Paramparagat Krishi Vikas Yojana. Additional resources have been made available through various philanthropic organisations.

Natural farming is "do nothing farming", according to Masanobu Fukuoka, a Japanese farmer who, in the 1970s, was a proponent of no-till, no chemical use in farming along with the dispersal of clay seed balls to propagate plants. He found it important to apply nature's principles in farming and developed a deep-rooted philosophy around the process.

Subhash Palekar developed the ZBNF after his own efforts at chemical farming failed. He identified four aspects that are now integral to his process and which require locally available materials: seeds treated with cow dung and urine; soil rejuvenated with cow dung, cow urine and other local materials to increase microbes; cover crops, straw and other organic matter to retain soil moisture and build humus; and soil aeration for favourable soil conditions. These methods are combined with natural insect management methods when required.

In ZBNF, yields of various cash and food crops have been found to be significantly higher when compared with chemical farming. For example, yields from ZBNF plots in the (kharif) 2017 pilot phase were found on average to be 11% higher for cotton than in non-ZBNF plots. The yield for Guli ragi (ZBNF) was 40% higher than non-ZBNF.

Input costs are near zero as no fertilizers and pesticides are used. Profits in most areas under ZBNF were from higher yield and lower inputs. Model ZBNF farms were able to withstand drought and flooding, which are big concerns with regard to climate change. The planting of multiple crops

and border crops on the same field has provided varied income and nutrient sources. As a result of these changes, there is reduced use of water and electricity, improved health of farmers, flourishing of local ecosystems and biodiversity and no toxic chemical residues in the environment.

In early 2016, [Sikkim was declared India's first fully organic State](#). But organic agriculture often involves addition of large amounts of manure, vermicompost and other materials that are required in bulk and need to be purchased. These turn out to be expensive for most small farm holders.

The changes taking place in Andhra Pradesh are a systematic scaling up of farming practices based on agro-ecological principles in opposition to the dominant chemical agriculture. Changes at this scale require many different elements to come together, but open-minded enlightened political leaders and administrators are fundamental.

Over the years, Andhra Pradesh has supported and learned from its many effective civil society organisations such as the Watershed Support Services and Activities Network, Centre for Sustainable Agriculture and the Deccan Development Society. A step-by-step increase in the area covered is another notable aspect. The scaling up relies primarily on farmers and local groups — all in all, very much a bottom-up process.

With its combination of delta regions, arid and hilly tribal areas, districts in Andhra Pradesh are similar to those in other parts of the country and could therefore serve as a model for replication. The approach taken by APPI to monitor the improvements is vital to understanding the outcomes of large-scale changes that are under way; this is critical to expanding the ZBNF to other States. As ZBNF is applied in India's various agro-ecological zones, making farmers the innovators is essential.

Resilient food systems are the need of the day given the variability of the monsoons due to global warming and declining groundwater in large parts of India. The drought-prone Rayalaseema region (Andhra Pradesh) is reportedly seeing promising changes already in farms with the ZBNF. More encouraging is that the programme can have a positive effect on many of the sustainable development goals through improvements in soil, biodiversity, livelihoods, water, reduction in chemicals, climate resilience, health, women's empowerment and nutrition.

Andhra Pradesh is one of the top five States in terms of farmer suicides. When asked about agricultural distress across the country, Mr. Kumar had one message for decision makers: "Don't listen to your scientists, listen to the farmers." Technology is simply the systematic application of knowledge for practical purposes and according to Mr. Kumar, the ZBNF is a technology of the future with a traditional idiom. Agricultural scientists in India have to rework their entire strategy so that farming is in consonance with nature. The dominant paradigm of chemical-based agriculture has failed and regenerative agriculture is the emerging new science.

The world is at critical junctures on many planetary boundaries, and establishing a system that shows promise in improving them while supporting people sustainably is surely one worth pursuing.

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