

REPORT

# Zero Budget Natural Farming Initiative in Andhra Pradesh, India: Towards Sustainable Agricultural Practices and Mitigating Climate Change Effects

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Climate change is for real and it is accelerating like never before. Instances from world over, be it the death of the coral reefs of the Great barrier reef or the melting of glaciers at the Arctic proves the extent of damage it is capable of. Climate change is affecting everyone. The most affected are those who are entirely dependent on natural resources for their livelihoods. The last decade has observed the largest migration ever in history due to changes in climate and environment ([https://migrationdataportal.org/themes/environmental\\_migration](https://migrationdataportal.org/themes/environmental_migration), Accessed October 15, 2018). Among those affected are the indigenous people, tribal and nomadic communities, small and marginal farmers, agriculture labourers etc. (Figure 1).

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Figure 1: A farmer in his drought affected field in India  
(Picture courtesy: Developmentnews.in, Accessed October 15, 2018)

Rampant deforestation, industrialisation, usage of synthetic inputs in agriculture, unsolicited use of natural resources are among the major reasons of this deteriorating climatic conditions. To understand the extent of effects and the mitigation strategies to cope with this is the need of the hour. Agriculture is and will be the biggest victim of climate change. Farm distress is on a rise all over. As the global population is bound to reach 9.8 billion by 2050, it is a major concern on how the existing agriculture practices would be able to cope with it. 60% of the world population is dependent on agriculture for sustenance (<http://www.expo2015.org/magazine/en/economy/agriculture-remains-central-to-the-world-economy.html>, Accessed October 15, 2018). To add to the woes, Green Revolution in the last century, world over, promoted hybrid and modified seeds, usage of synthetic chemicals and pesticides leading to increased cost of cultivation, decreased yields, reduced soil fertility along with adverse health impact on farmers and consumers.

Interestingly, as agriculture faces the wrath of climate change, it has also emerged as a solution for the same. For years, oceans have been the major carbon sinks, absorbing carbon dioxide from the atmosphere. But as they have saturated, the world view has now shifted towards sustainable agriculture. It is observed that through sustainable agricultural practices, the atmospheric carbon can be sequestered (draw down) in the soil in organic form (<https://www.drawdown.org>, Accessed on October 18, 2018).

Several initiatives and movements in this regards is gaining popularity across the world, be it regenerative agriculture in USA, carbon farming/ liquid carbon pathway in Australia, agroforestry, organic farming, natural farming, permaculture, solar farming etc. These various farming methodologies falls under the bigger umbrella of agroecology. The term agroecology can be used in multiple ways, as a science, a movement as well as practice (<http://environment-ecology.com/what-is-ecology/296-what-is-agroecology.html>, Accessed October 18, 2018).

It is in this context that Andhra Pradesh is pioneering the Zero Budget Natural Farming (ZBNF) programme. A movement of the farmer, by the farmer and for the farmer.

The South Indian state of Andhra Pradesh (AP) with a population of 90,193,287 (2018 figures) has established itself as the hub of the self-help movement by building institutions and federation for poor (especially women) for 28 years now. While developing a strong social capital, initiatives like the Community Managed Sustainable Agriculture (CMSA) and Non-Pesticide Management (NPM) have maintained a strong community engagement. It is on this basis that the Zero Budget Natural Farming programme has been initiated bringing a paradigm shift in agriculture within the state.

#### **What is Zero- Budget Natural Farming?**

This method of agriculture has been developed by an Indian farmer, Mr. Subhash Palekar. As a practicing farmer he undertook years of intense experimentation and observation and suggested the four wheels of ZBNF (<http://www.palekarzerobudgetspiritualfarming.org>, Accessed on October 16, 2018).

1. *Beejamrutham* (Seed treatment): Microbial Seed Coating through cow urine and dung based formulations.
2. *Jeevamrutham*: Bio-Inoculant to stimulate soil microbiome
3. *Acchadana*: Cover Crops, Mulching with crops and crop residues
4. *Whaphsa*: Soil Aeration and water vapor harvesting.

Livestock especially cows are the major requirement for inputs in ZBNF. Cow urine and cow dung are essentially required to make formulations like *Ghanajeevamrutham* and *Dravajeevamrutham*. These inputs are not used as a fertiliser, rather they are used as inoculants. Figure 2 shows the farmers preparing the inputs through the use of cow urine and cow dung. These inoculants stimulate the exchange process between plants, soil microbes and soil

nutrients by making the essential nutrients bio-available to the plants. It also enhances soil biology through continuous creation of 'humus' and soil organic matter.

ZBNF focuses on keeping the soil always covered with crops through poly-cropping, intercropping, multi-layer farming, etc. This is extremely essential to improve soil fertility and reduce evaporation losses from the soil. These

practices lead to greater soil humus production, and thereby enhanced water vapour condensation on the soil surface providing 'irrigation'.

Moreover, the investment of the main crop is recovered from that of the income from the intercrops. The inputs required for making the inoculants are also locally available. Hence, the terminology, 'Zero Budget'.



Figure 2: A= Preparation of *Dravajeevamrutham*; B= Preparation of *Ghanajeevamrutham*  
C= Intercropping in a farm in Guntur, AP; D= Seed treatment of groundnut  
(Pictures courtesy: Official District teams' group, AP)

It is because of its simplicity that it is extremely beneficial to small, marginal farmers and tenant farmers. The farmers get to see the visible impact from the first season of harvesting itself. Crop cutting experiments (CCEs) conducted across the state have also shown encouraging results. In 100% CCEs there was a reduction in cost of cultivation and in 88% increase in yield and decrease in costs was observed (Crop Cutting Experiment( CCEs) conducted during 2017-18). The farmers also observed increased earthworm movement, friendly insects, birds and honey bees along with improved soil texture and fertility.

Seeing the immediate economic and ecological benefits of ZBNF, Andhra Pradesh has vowed to become the first Natural Farming state of India. It aims to reach six million farmers and cover over eight million hectares of land through ZBNF in the coming years.

ZBNF extension is done by a unique community approach. Best ZBNF practitioners, Community Resource Person(CRP) become trainers and disseminate ZBNF in the villages. They stay with the farmers and guide and motivate them to pursue ZBNF along with providing consultation on various aspects of ZBNF. They also create more human and other resources like themselves to ensure that ZBNF reaches more and more farmers. This strategy interlaced with women self-help groups have helped in addressing the gender issue in agriculture. It is essential that men and women both participate in the dialogue of agriculture, discuss, practise and propagate ZBNF in the entire village.

The facilitation in the villages for managing these Community Resource Persons and self-help groups is carried out by the State Agriculture Department. The ownership of ZBNF by the department has ensured that the programme has



Figure 3: Examples of emerging biodiversity in ZBNF farmers (Picture courtesy: State ZBNF team, AP)

now gained momentum for scaling up. A young brigade of Natural Farming Fellows (NFFs), fresh graduates from agriculture and allied Colleges take up ZBNF. They stay in the villages allotted to them and become role model farmers, trainers and researchers on ZBNF. This unique social capital is helping the programme in agricultural research on ZBNF and making agriculture aspirational for the youth. Moreover, innovation in the use of ICT and digital methods to make dissemination more effective has been crucial for expansion.

The community lead input preparation by means of self-help groups and farmers who come together, estimate the input requirement for the cropping season and prepare the required quantity on a large scale or periodically as and when required has triggered the adaptation of ZBNF in the villages.

There are many farmers who do not own a cow and hence find it difficult to prepare the input

inoculants. A ZBNF shop is set up in each village by identifying an individual of entrepreneurial spirit who provides the inputs to farmers as and when required (Figure 4).

Community based marketing has ensured that farmers and their families along with other houses in rural areas get healthy food first. A food security plan is prepared at the village level, to estimate the requirement and surplus of the crops, grains and cereals required and how much marketable produce would be available after harvesting and consumption.

The APZBNF programme step by step is reaching towards its vision of reaching all its farmers by 2024. The community based approach which involves men as well as women in the ZBNF discussion has proved to be a major game changer (Figure 5). Anecdotal evidences and testimonials from farmers suggest that the impacts are not just monetary, it is environmental,



Figure 4: Collective Beejamrutham preparation in Nellore, AP  
(Picture courtesy: District team, Nellore, AP)



Figure 5: A woman ZBNF farmer in the programme with all smiles for a good cashew harvest.  
(Picture courtesy: SIFF team field visit)

social and political as well.

Further research and study are in progress to address larger questions on 'how' ZBNF provides nutrition to the soil, carbon budget and speed of humus formation, impact of ZBNF on yield water holding capacity and other avenues. These five questions were addressed at a workshop organized by APZBNF and Reading University, Vijayawada, Andhra Pradesh in September, 2018.

Andhra Pradesh's Zero Budget Natural farming programme is an example of how

government through community level engagement through natural inputs scale up sustainable agricultural practices. It is only through this collective action could the problem of climate change be addressed and measures taken to mitigate it. Thus livestock wastes have added value for food security in climate change affected soils and poverty stricken communities. Thus, more research, fund, dialogue, commitment, adaptation is required towards sustainable and agro-ecological practices for a better future and ensuring well-being of planet and its people.

