

Zero Budget Natural Farming in Andhra Pradesh: Towards Sustainable and Profitable Farming¹



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Executive Summary

Introduced a little more than three years ago in 2015, the Zero Budget Natural Farming (ZBNF) programme in the Indian State of Andhra Pradesh has attracted considerable international attention. The ZBNF is a farming practice that avoids the use of external chemical inputs and relies on drawing inputs from nature itself. The programme was selected by the Paris Peace Forum as a leading example of sustainable development worthy of being followed by governments in other countries. The United Nations Environment Programme is also collaborating with the government of Andhra Pradesh in supporting the programme.

Implemented by the *Rythu Sadhikara Samastha*, a not-for-profit company of the government of Andhra Pradesh, the ZBNF has been adopted by more than 163,000 farmers in 9,722 villages across all 13 districts of the state. The plan is to include six million farmers in the ZBNF by 2024, with the cultivable area under the practice aimed at eight million hectares by 2026. The programme specifically focuses on marginal farmers, with around 20 per cent of ZBNF practicing farmers being among the poorest. Adoption of the ZBNF is expected to increase incomes for these farmers through lower input costs, higher productivity and diversified livelihoods.

The ZBNF programme also actively involves rural women with the objective of their socio-economic empowerment. The Andhra Pradesh government has actively involved women self-help groups to spread awareness about the programme. Besides women, dedicated community resource persons, drawn from among farmers, are helping in expanding the ZBNF through a cluster-based approach involving the *gram panchayats* (village council). Specific human resources for devising innovative farming models using natural farming techniques, trainings and workshops for farmers and Information technology-enabled dissemination for aiding farmers are also part of the programme.

Initial results on adoption of the ZBNF practices from the state are encouraging in terms of higher net incomes of farmers and greater crop yield. The key implementation challenge is to maintain the rate of progress on its wider adoption by encouraging farmers to switch from conventional chemical input-based farming to the 'natural' ZBNF practice.

¹ The Institute of South Asian Studies (ISAS), an autonomous research institute at the National University of Singapore (NUS), will be publishing a series of papers on various significant economic and business developments in the Indian state of Andhra Pradesh. These papers are part of ISAS' initiative to look closely at Andhra Pradesh for a deeper understanding of various policy initiatives by the state and their wider dissemination in an objective manner. This paper is the first in the series. ISAS is working closely with the Andhra Pradesh Economic Development Board in bringing out these papers.

Introduction

Agriculture is the largest contributor to the gross state domestic product (GSDP) of Andhra Pradesh, with a share of 34 per cent. The sector provides livelihood for 60 per cent of the state's population (Table 1). Andhra Pradesh is the 9th largest crop producing state in India. It is the largest producer of fruits, chilies, cocoa, lime, palm oil, papaya and tomato among Indian states while being the second largest producer of cashew, mango and sweet orange. It is, therefore, natural that agriculture, given its predominance in the state economy, would be a top priority with respect to the improvement of the farmers' conditions and welfare. This assumes particular importance at a time when farmers' distress is among the most serious concerns engaging policymakers. Farming practices like the Zero Budget Natural Farming (ZBNF) have considerable significance in this respect.

Table 1: Overview of Agriculture and allied sector in Andhra Pradesh

Contribution to GSDP (%)	34.0
Population employed (%)	60.0
Total area under cultivation (in million hectares)	3.97
Total Volume of fruit production (in million tonnes)	12.098
Fruit Production as a proportion of national production (%)	13.0

Source: Horticulture Statistics at Glance 2017, Ministry of Agriculture & Farmers' Welfare, Page 9; <http://agricoop.nic.in/sites/default/files/Horticulture%20At%20a%20Glance%202017%20for%20net%20uplod%20%282%29.pdf>.

ZBNF: Adoption and Funding

The large-scale adoption of the ZBNF in Andhra Pradesh aims to address the core imperative of improving economic welfare of farmers. It attempts to do so by squarely focusing on sustainable development. Andhra Pradesh seeks to achieve a significant part of its Sustainable Development Goals by 2022, notwithstanding the administrative challenges it faces in doing so post-bifurcation in 2014.

The ZBNF avoids the use of synthetic fertilisers and other 'non-natural' agricultural inputs. It is based on the principle of poly-cropping that enables the farmers to recover expenditure on longer-duration crops from the short duration ones, thereby characterising the process as 'zero budget'.² The initiative has been pioneered by the *Rythu Sadhikara Samastha* (RySS), a not-for-profit company owned by the state government. Initiated in June 2015, the programme has been implemented at the field level commencing from the *kharif* season of 2016.³ The programme was mentioned by the Paris Peace Forum 2018 as a notable example of sustainable development.⁴

² <http://apzbnf.in/faq/>; Rythu Sadhikara Samastha (RySS), Government of Andhra Pradesh. Accessed on 2 January 2019.

³ <http://apzbnf.in/faq/>; Rythu Sadhikara Samastha (RySS), Government of Andhra Pradesh. Accessed on 2 January 2019.

⁴ 'Paris Peace Forum Selects 5 Indian Projects During its 1st Edition Meet', *iamrenew*, 14 November 2018; <https://www.iamrenew.com/sustainability/paris-peace-forum-selects-5-indian-projects/>. Accessed on 2 January 2019.

The ZBNF initiative has witnessed multiple actors coming together for its funding. The Ministry of Agriculture of the Government of India and the Andhra Pradesh state government are supporting the programme under the Rashtriya Krishi Vikas Yojana and the Paramparagat Krishi Vikas Yojana schemes. The Azim Premji Philanthropic Initiatives (APPI) has been supporting RySS in implementing ZBNF since 2017 through technical support grants. The APPI is also working closely with RySS in supporting the growth and expansion of human resources and technical practices on promoting the ZBNF practice. From June 2018, BNP Paribas and the United Nations Environment Programme have been supporting the ZBNF as part of the Sustainable India Finance Facility.⁵

The ZBNF has made rapid progress since its inception. All districts of the state have adopted it, with more than 163,000 farmers in 9722 villages practising the ZBNF. The coverage is slated to increase further. As on September 2018, around 354,000 farmers have been enrolled under the ZBNF, with the state government aiming to include 500,000 farmers across 3,015 villages under the practice by the end of FY2018-19. The long-term vision is to cover six million farmers across 12,924 *gram panchayats* (village councils) by 2024 and have a cultivable area of eight million hectares by 2026 under the ZBNF (Table 2).

Table 2: ZBNF: Progress and Targets

Farmers to have adopted ZBNF	163,000 (across 9722 villages)
Farmers enrolled (as on September 2018)	354,000
Farmers to be covered by FY2018-19	500,000
Farmers to be covered by 2024	6 million

Source: 'Zero Budget Natural Farming for the Sustainable Development Goals', Council for Energy, Environment and Water (CEEW), Issue Brief, 2nd Edition, September 2018.

Poor Farmers, Women and Agro-Forestry

An important aspect of the ZBNF is its focus on small and poor farmers. About 20 per cent of the farmers covered are among the poorest. These include farmers with less than 2.5 acres of dry-land or 1.25 acres of wet-land, single women farmers and farmers belonging to scheduled castes and scheduled tribes.⁶ The programme has the ambitious objective of providing food security to these poor farmers by enabling them to generate a net income of ₹100,000 (S\$1,900) per annum for each family. The income is expected to be generated through reduced input costs, increased productivity and diversified livelihoods.⁷ Special models are being employed to address the specific needs of poor farmers such as providing special access to bank credit, use of poly-cropping and raising backyard poultry and cattle.

Community resource persons (CRPs) are being allotted to marginal farmers to enable them to implement the ZBNF. The CRPs are farmers with expertise in natural farming and are engaged by the RySS to share knowledge on the ZBNF with other farmers across the state. The CRPs are vital to the adoption and sustenance of the ZBNF and they have been educating the

⁵ BNP Paribas joins the sustainable project Zero Budget Natural Farming, in India, dated 2 June 2018, <https://group.bnpparibas/en/news/bnp-paribas-joins-sustainable-project-budget-natural-farming-india>.

⁶ Zero Budget Natural Farming for Sustainable Development Goals, Issue Brief, 2nd Edition, September 2018, Page 5; https://www.ceew.in/sites/default/files/CEEW_ZBNF_Issue_Brief_2nd_Edition_19Sep18.pdf.

⁷ Ibid, p. 6.

farmers on the benefits of the practice, as well as the methods for adopting the ZBNF through *inter alia* persuasion, practical training sessions, farmer field schools and video dissemination.

In addition to poor farmers, the ZBNF places emphasis on encouraging rural women to develop as entrepreneurs by selling to farmers ZBNF-related inputs such as natural fertilisers and biocide mixtures. The programme also envisages training women to film and disseminate videos on ZBNF methods so as to encourage other farmers into the programme. An obvious outcome of the approach is socio-economic empowerment of the rural and economically-marginal women, who, as a result of the efforts, can assume leadership positions in local communities. Indeed, women self-help groups (SHGs) are playing a significant role in spreading awareness on the practice. The state government intends to utilise the network of women SHGs, comprising 730,000 women and covering 80 per cent of farming households in the state. Men from the same households from which women are promoting the ZBNF are also being encouraged to form SHGs to increase the participation and network of the SHGs in the ZBNF programme.

Finally, the RySS aims to adopt the agro-forestry model to restore forest land area. This involves encouraging tribal and local farmers to plant trees along with crops on the same plot of cultivable land. The model is expected to result in greater land productivity, natural landscape restoration and prevention of biodiversity loss. In the drought-prone districts of Andhra, the programme has promoted growth of farm ponds for water storage.

Decentralised Cluster-based Community Approach

The ZBNF is relying on a decentralised approach for its voluntary adoption by farmers. The RySS has made its adoption community based. The community-based, decentralised cluster approach is focusing on building robust bodies/systems at the village, *gram panchayat* and the district levels. Farmers are being trained by a 4,500-strong CRPs volunteer community, disseminating technical know-how at the village, *panchayat* and cluster level.

The decentralised structure consists of CRPs at the village (Junior/Level 3), *gram panchayat* (Senior/Level 2) and Cluster (consisting of 4-5 *gram panchayats* (Level 1)) levels (Figure 1). The CRPs – typically selected by a group of farmer members at each level – are disseminating know-how across the village/districts/state and reaching out to other farmers. According to data available up to September 2018, the ZBNF is operating in 3,015 villages and 839 clusters with the support of 4,568 CRPs.⁸

Human Resource, Training and Technology

The Andhra Pradesh government is training young graduates and postgraduates with a background in agriculture to develop as Natural Farming Fellows (NFFs) to contribute to the ZBNF. The NFFs will work closely with the farmers and would experiment in devising farming techniques and innovative farming models using principles of natural farming. So far, 230 NFFs have been recruited and trained.⁹

⁸ Ibid, page 9.

⁹ Ibid, page 22.

Training is an important aspect of the ZBNF programme. The state government and the RySS are conducting practical demonstrations for farmers on the benefits of practising the ZBNF through higher crop yields, lower farming costs and long-term sustenance of the environment. Several training programmes and workshops have been conducted to introduce the ZBNF practice and techniques to the farmers. The RySS, in collaboration with the education department of the Andhra Pradesh government, is developing content on natural farming for schools. The staff and students in government schools are being encouraged to use natural farming techniques in school gardens.

Information technology is being actively employed in the spread and consolidation of the ZBNF by developing farmer databases, performing e-tracking of the ZBNF practices across the state, monitoring functionaries, geo-mapping fields and disseminating climate information.¹⁰ Video content on the ZBNF methods and techniques are being developed by the RySS in partnership with the Digital Green Foundation. Workbooks, primers, crop cards with detailed information on the processes under the ZBNF, explained simply with visuals, are being made accessible to farmers in the vernacular language. Such efforts are essential to ensure that the farmers remain committed to the ZBNF and refrain from switching back to conventional farming using chemical inputs.

Results

Initial results on adoption of the ZBNF are encouraging. Studies conducted by the RySS on crop cutting experiments in 2017 point to farmers using the ZBNF practices incurring less cost, gaining more yield and earning higher income. Farmers growing paddy using the ZBNF have reported more than 50 per cent increase in net income, as compared with their non-ZBNF counterparts. The increase in net income for commercial crops, such as rain-fed groundnut and cotton, are much larger. Yields have been significantly high for the ZBNF groundnut farmers and also better for paddy farmers.¹¹ Higher yields vindicate the utility of sustainable farming practices, which also improve the farmers' capacity to adapt to climate change. There is also initial evidence of the ZBNF techniques improving the resilience of farmlands and crops against extreme weather events.¹²

Final Thoughts

Andhra Pradesh's efforts to expand ZBNF by encouraging farmers to adopt its practice have significant implications for a country struggling to find solutions to increase farmer incomes. This is particularly important at a time when policymakers are struggling with various options – increasing minimum support prices, waiving off agricultural loans and introducing direct income transfers – to support the farmers.

¹⁰ Ibid, page 19.

¹¹ The reported increases in net farmer incomes for paddy, groundnut and cotton are 51 per cent, 135 per cent and 87 per cent respectively. Yields for groundnut and paddy farmers report increases of 36 per cent and 9 per cent on an average. Ibid, pages 5-6.

¹² During a bout of cyclonic winds in Vishakhapatnam, a major port city on the coast of Andhra Pradesh, in 2017, farmers reported the ZBNF paddy fields withstanding winds and water logging much better than adjacent non-ZBNF paddy fields. This is likely due to roots going deeper, stems being thicker and soil being more porous under ZBNF.

By combining sustainable development principles with income-generating prospects, the ZBNF has the potential to significantly enhance the economic welfares of India's poor farmers. The enthusiasm with which the international community has noted its application also marks its appeal in promoting sustainable environment-friendly farming practices in other parts of the world.

India and Andhra Pradesh's efforts in institutionalising the practice, however, needs to overcome the fundamental challenge of convincing the farmers to remain committed to the practice and not revert to chemical-based farming. Chemical input-intensive farming has intrinsic appeal – not just in terms of being a familiar practice with the farmers for decades, but also because of the uncertainties of returns associated with new, alternative practices like the ZBNF. It's important, therefore, that the encouraging economic results from the application of the ZBNF be widely publicised and demonstrated to make it a 'convincing' option. At the same time, it is also essential for the community-based approach to embrace all stakeholders to expand the ZBNF. Among these stakeholders, the roles of local bodies and women SHGs are particularly essential for to expand the ZBNF.

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