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## ORGANIC AGRICULTURAL PRACTICES IN ANDHRA PRADESH

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### ABSTRACT

Agriculture specifically Organic Agriculture has the potential to make a cost effective contribution to mitigation of Climate Change, since, it realizes mitigation and sequestration of CO<sub>2</sub> in an effective way. Organic Agriculture aims at improving soil fertility and Nitrogen supply by using leguminous crops, crop residues and cover crops. The enhanced soil fertility thus leads to stabilization of soil organic matter and in many cases to a sequestration of carbon dioxide into the soil. This in turn increases the soil's water retention capacity, thus contributing to better adaptation of Organic Agriculture under unpredictable climatic conditions with higher temperatures and uncertain precipitation levels. Organically managed soils because of high organic matter content retain significantly more rain. The organic matter in the soil serves as sponge, absorb and retain more rain water. Organically managed soils are better adapted to weather extremes and are in good position to maintain productivity in the event of drought, irregular rainfall events even with floods and rising temperature. Organic soil fertility techniques have potential to enhance the productivity of degraded lands by enhancing the organic matter levels in the soil. Soil erosion, an important source of CO<sub>2</sub> losses, is effectively reduced by Organic Agriculture as it sequesters CO<sub>2</sub> in the soil and is expected to stop soil erosion (Bellamy et al., 2005) and converts carbon losses into gains. Consequently considerable amount of CO<sub>2</sub> may be removed from the atmosphere.

### Introduction

Like in any other states of India, farmers of AP were also farming traditionally. However, food crisis and population pressure together during early sixties paved way to green revolution. As a result, production of food grains in India during 1949-50 to 1998-99 increased at the rate of 2.5% per annum leading to not only sufficiency but also surplus for export. The yields were increased because of new technology like introduction of HYV, extension of irrigation areas, and usage of high analysis NPK fertilizers, mechanization and increase in cropping intensity. Andhra Pradesh has been one of the front-runners in reaping the benefits of green revolution. However, the adverse impact of green revolution technology has been strongly felt only after Forty years of practicing. Green revolution no doubt increased the food grain production but at the cost of environment. The modern Agriculture practices and irrational use of chemical inputs over the last four decade resulted in development of vast stretch of degraded lands, loss of natural habitat balance, loss of soil health and caused many hazards like soil erosion, decreased ground water table, soil salinity, pollution due to fertilizers & pesticides, genetic erosion, effect on environment, reduced food quality and increased cost of cultivation, making the Agriculture unviable and uneconomical. The heavy metals in the fertilizers and pesticides have entered in to the food chain as is the case with DDT contamination.



Further, Green revolution technology is also one of the causes and accelerator of today's Climate Change issue the major threat to the mankind and economy.

### **Definition of Organic Agriculture**

'Organic Agriculture is a holistic production management system which promotes and enhances agro-ecosystem health, including biodiversity, biological cycles, and soil biological activity. It emphasizes the use of management practices in preference to the use of on-farm inputs, taking into account that regional conditions require locally adapted systems. This is accomplished by using wherever possible, agronomic, biological and mechanical methods, as opposed to using synthetic materials, to fulfill any specific function within the system' (FAO 1999).

### **Objectives of Organic Agriculture:**

1. To study the usage of chemical inputs fertilizers and pesticides there by not polluting the soil, environment and ground water with chemical residues.
2. To assess the Increase/maintain biological diversity and heterogeneity among plants and animals.
3. To Utilization of available farm resources duly recycling them.

### **Organic Agriculture Practices:**

In the context of visible adverse impact of green revolution technology coupled with negative impact of Climate Change on Agriculture production, there is growing interest among the scientific community and also farmers, in finding alternative farming systems. One of the approaches would be to build upon age old traditional methods of crop production which are purely organic in nature, largely excludes chemical inputs. Fortunately, there is still a vast store of organic agriculture know-how in many of the farming households. Many traditional farmers in Andhra Pradesh are still practicing organic/ traditional farming methods that are in balance with the surrounding ecosystems, stable, sustainable and are highly efficient. Further, the new chemical Agriculture technology also has its own advantages, hence, blending of the Organic Agriculture practices with new technology will bring basketful of technological options that are socially acceptable, economically viable and environmentally safe. Organic agriculture was developed as a holistic, ecosystem-based approach, conceived as an alternative to what proponents see as the ecologically unsound practices of conventional agriculture.

Organic Agriculture is gaining importance in all over the world as it offers a viable option to ill effects of modern Agriculture and adaptation and mitigation scope against Climate Change. Organic Agriculture is a form of Sustainable Agriculture system that aims for conservation of resources and protection of natural environment so that the needs of the people living today can be met without compromising the ability of future generation to meet their own needs. Modern Organic Agriculture is the form of Agriculture that relies on techniques such as multiple crops, crop rotation, green manure, compost and biological pest control to maintain soil productivity and control pests on a farm. Organic Farming does not mean going back to traditional



methods. It takes the best of the traditional practices and combines them with modern scientific knowledge. Organic Agriculture also has weaknesses, mainly related to productivity and yield losses in some crops such as Potatoes, Grapes, Horticulture crops, Vegetables etc. Pest and disease management relating to these crops have not yet been resolved satisfactorily. Such issues highlight the need for more research and investments followed by better technology transfer from research to practice. Further, techniques of improved manure management, manure application techniques, proper storage methods are lacking. Improved plant protection techniques are also a gap in Organic Agriculture. Breeding strategies for adaptability to management and environmental stress situations both in crops and livestock is required. In spite of these weaknesses, Organic Agriculture is so far the most promising approach for mitigation and adaptation to Climate Change. Organic Agriculture represents a positive example of how farmers can help mitigate Climate Change and adapt to its predictable and unpredictable impacts.

### **Government role in promoting Organic Agriculture in Andhra Pradesh:**

The farmers of Andhra Pradesh, especially in Rainfed regions have been practicing organic cultivation of crops since time immemorial. Government of AP is also promoting various Organic Agriculture practices in big way such as, compost preparation by pit method in convergence with MGNREGS of GoI program and Vermicompost units (ring methods) through RKVY program. In view of increasing demand for Certified Organic products in the national and International market and to benefit the farmers, the department of Agriculture had also taken up the Certified Organic Farming program under National Program for Organic Production (NPOP), only for Pulses and Paddy crops since 2006. Department is providing 100% cost of Certification, cost of NADEP compost unit, cost of various organic inputs such as Biofertilizers (Rhizobium, PSB, Azospirillum & Azatobacter), botanical pesticides (Neem oil), green manure seeds etc to all the Organic Farmers registered under the program. Total 4000 farmers have been organised in to 22 groups, one in each district. Farmers were trained on Organic Farming practices and preparation of botanical concoctions for use in crop production. Department is working as service provider in maintain the records and documents required for Organic Certification. Department has also authorized two private certification agencies viz., APof Organic Certification Agency and Vedic Organic Certification Agency, and is about to establish marketing linkage for organic produce with various Organic produce buyers for local markets and also for export. The Andhra Pradesh state's policy on Organic Farming is yet to be finalized and the draft policy is developed in this regard and is being discussed at various levels.

### **ORGANIC AGRICULTURAL PRACTICES IN ANDHRA PRADESH:**

The Organic Agricultural practices alone may not meet the demand of food grain production. As the chemical technology also has its own advantages, blending of the old techniques with that of new ones will bring a basketful of technological options that are socially acceptable, economically viable and environmentally safe. Such blend of practices will be readily acceptable to small and marginal farmers. Integrated Nutrient Management (INM), Integrated Pest Management (IPM) and



Integrated Farming Systems Approach (IFSA) are some of the viable options in the present context. Even Certified Organic Farming may also be promoted to capture the ever increasing national and international market for Organic Products. As part of the present study, the various Organic Agricultural practices prevailing in Andhra Pradesh and specifically in SPACC project districts are documented and their potential in the context of Climate Change is well discussed in this chapter. Most of the practices presented here have scope to scale up in larger areas and few others need technical validation. Such immense wealth of Traditional knowledge on Organic Agriculture practices can be best used in developing package of practices for important crops under organic production. The Organic Agriculture practices are discussed under the following five sub-headings; i. Organic Seed Treatment Methods ii. Crops and Cropping Systems iii. Soil Fertility & Crop Nutrition Management iv. Pest & Disease Management v. Post Harvest Management Techniques & Storage Methods.

### **Details of the SPACC project area where the Organic Agriculture practices in Andhra Pradesh**

<b>S. No</b>	<b>District</b>	<b>No. of Project (Pilot) Villages</b>	<b>NGO Partner</b>	<b>Field Unit</b>
1	Chittoor	13	Gram Vikas Samstha (GVS)	Madanapalle
2	Kadapa	13	People's Activity and Rural Technology Nurturing Ecological Rejuvenation (PARTNER)	Porumamilla
3	Anantapur	16	Star Youth Association (SYA)	Guthi
4	Prakasam	16	Development Initiatives and People's Action (DIPA) Giddalur	Giddalur
5	Prakasam	19	Society for Sustainable Agriculture And Forest Ecology (SAFE) Cumbhum	Cumbhum

### **Traditional Crops and Cropping Systems**

Monoculture system and Agri-based industrialization promoted under Modern Agriculture era lead to low biodiversity, un-uniform nutrient use and pests build up, necessitating the greater use of pesticides and fertilizers. In contrast, crop diversification by growing different crops in time and space seeks to enhance the Agro-ecosystem resilience to external shocks such as extreme weather events or price variation, such risks are likely to increase as the Climate Changes. The diversification of cropping systems also make more efficient use of available soil nutrients, with improved productivity and economic performance, which is of high importance in times of limited nutrients and financial constraints. Growing a number of different crops rather than relying on one crop is also very important to make the system resilient to Climate Change. This helps to protect against pests and diseases and acts as insurance against crop failure in unusual weather such as drought or flood. Farmers in Rainfed region of Andhra Pradesh by tradition do not only rely on only cash crops but also grow food crops for household consumption.



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### **Soil Fertility & Crop Nutrition Management:**

The soil is a living system and habitat for millions of soil microorganisms that are very important for release of nutrients from native soil as well as from applied nutrient sources and made available for plants. Organically managed soils excludes high analysis fertilizers, hence, reduces N<sub>2</sub>O emissions from soils. Artificial fertilizers provide only short term nutrient supply to crops and encourage plants to grow quickly but with soft growth which is less able to withstand drought, pests and diseases. These provide nutrients for plants but do not improve soil structure. They usually only improve yields in the season in which they are applied.

### **Vermicompost application:**

Vermicompost is the end-product of the breakdown of organic matter by some species of earthworms. Vermicompost is a nutrient-rich, natural fertilizer and soil conditioner. Vermicompost (compost made by earthworms) is very rich in nutrients, can act as the single source of all nutrients the crop needs. It contains approx. 1.5% Nitrogen, 0.5% Phosphorus and 0.8% Potassium, as well as other micronutrients besides, containing 10% organic carbon. It also contains millions of microbes which help break down nutrients already present in the soil into plant-available forms. Unlike other compost, worm castings also contain worm mucus which keeps nutrients from washing away with the first watering and holds moisture better than plain soil.

### **CONCLUSION:**

Organic Agriculture is one best option that enables ecosystems to better adjust to the effects of Climate Change and has major potential for reducing agricultural Green House Gas emissions. Organic Agriculture has a strong potential for building resilience in the face of climate variability. Organic Agriculture systems have an inherent potential to both reduce GHG emissions and to enhance carbon sequestration in the soil. GHG emissions are reduced in organic systems by avoidance of mineral fertilizers. The highest mitigation potential of Organic Agriculture lies in carbon sequestration in soils and enhancing crop biodiversity, restoring natural ecosystem.

Public policies and research support is highly required to promote Organic Agriculture. In general, Organic Agriculture practices are labour intensive and needs government support through appropriate policies. The main drawback in adopting organic practices is non-availability of sufficient quantity of organic inputs and high labour cost. For example, policies for MGNREGS support to prepare and incorporate compost and vermicompost in the soil. Example 2- Government support in the form of subsidies for organic inputs and labour cost in the manner supporting the chemical inputs. Government can take up the large scale production of inputs on Government land such as community composting will generate employment and ensure timely supply of input to Rainfed farmers. Example3- De-silting activity needs greater support from the government and non-governmental agencies for achieving multiple outputs like employment generation for landless, rejuvenating of the tanks and for enhanced productivity of dry land crops. Organic agriculture has great potential to



reduce farmers' risks. A single organically grown crop might yield less than if it were grown conventionally, but the total value of all the organic crops, in combination with drastically reduced input costs, many give farmers a similar or (somewhat higher) profits. The organic farmer also is cushioned from price fluctuations of 92 individual crops, bad weather and environmental degradation under diversified farming systems as well as under diversified crops and cropping systems.

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