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A Comparative Review of Natural and Conventional Farming

Ms. Pooja Kumari[1], Prof. Dr. Kishor Kumar[2]

[1]PhD Research Scholar, Economics, Himachal Pradesh University, Shimla
[2]Assistant Professor, Economics, Himachal Pradesh University Regional Centre, Dharamshala

Abstract
This review paper compares natural and conventional farming systems on the basis of cost, return and profitability. The study also examines the main challenges faced by farmers under natural farming. The review of literature indicates that the cost of cultivation decreases under natural farming compared to conventional farming due to decease in the cost of inputs. Most of the studies reported that there had decline in the crop yield and increase in the net income due to decease in the cost of cultivation under natural farming. however, some studies indicate the improvement in crop yield. Major challenges faced by farmers in natural farming includes: higher labour cost, low yield, non- availability of specialized markets, unfair price in the markets, preparation of natural inputs, lack of training and knowledge, animal attacks. Overall, natural farming has the potential to increase farm profitability by reducing the cost of cultivation and increasing net income, but the crop yield may vary across the region.

Keywords: Natural Farming, Conventional Farming, Sustainable Agriculture, chemical- free farming, cost, return, profitability.

Introduction

There was a decline in the annual growth rate of agricultural production index of foodgrains, non-foodgrains, and all crops in the period of 1981 to 2016. There was a shift in the foodgrain area to non-foodgrains during 1980. The total yield of both foodgrains and non- foodgrains increased due to green revolution but the growth of production was started declining in 1990s. India faced two consecutive droughts during 2014-15 and 2015-16. So, there was a need of alternative method of agriculture which required less credits (Mishra, 2018). The use of high yielding variety seeds, chemical fertilizers and pesticides were depleting high level of nutrients from soil, polluting groundwater and reducing the population of beneficial microbes. They had created negative impact on environment and human health. So, there has a need of organic agriculture, sustainable agriculture or ecological agriculture (Kumar et al., 2019). The Organic fertilizers are more cost- effective and environmental- friendly rather than chemical fertilizers. The organic farming provides quality food without adversely affecting the health of soil, human and environment. Biological Nitrogen fixation, crop rotation, residues of crops, Bio- pesticides, and biogas slurry are the various components of organic farming system. Vermicomposting is a main element of organic husbandry for the enhancement of soil fertility (Mukherjee et al., 2022). Natural farming has the best option to deal with these problems. It conserves nature, reduce health risk from chemical, reduce carbon emission and carbon capture, social impact with low cultivation cost and stable yield, and direct economic benefits (Korav et al., 2020).

The concept of Zero Budget Natural Farming was firstly developed by Shri Subhash Palekar in Maharashtra. The zero-budget natural farming has done with the help of locally available natural resources that includes chemical free inputs and homemade pest control methods with zero spending on purchased inputs. Jivamrita, Bijamrita, Acchadana- Mulching and Wapasha- Moisture are the four pillars of zero budget natural farming. (naik et al., 2021). Jivamrit provides nutrients to the soil and prevent the plant from fungus and bacteria with increasing the activity of earthworms. The ingredients of jivamrit are: cow dung, urine, jaggery and dicot floor. Bijamrit is a seed treatment which protects young roots from fungus. The ingredients of Bijamrit are: water, cow dung, urine, lime, and handful of soil. Acchadana- mulching is related to soil mulch or live mulch to conserve soil moisture by reducing evaporation. Wapasha- moisture is related to reduction in irrigation. It is a condition where both air and water molecules present in soil. There are some pest management formulas of natural farming such as: Neemastras, Agniastras, and Brahamastras. The ingredients of Agniastras are: cow urine, tobacco, green Chilli, local garlic, and neem leaves pulp. It deals with pests like Leaf Roller, Stem Borer, Fruit borer, and Pod borer. The ingredients of Bhramastras are: neem leaves, custard apple leaves, lantern camellialeaves, guava leaves, pomegranate leaves, papaya leaves and white dhatura boiled in urine. It deals with sucking pests, pod borer, fruit borer etc. the ingredients of Neemastras are: cow urine, cow dung and neem leaves and neem pulp. It deals with sucking pests & Mealy Bug (Bishnoi and Bhati, 2017). Crop rotation, green manures and compost, biological pest control, and mechanical cultivation are principal methods of Zero- Budget Natural Farming (Choudhary et al., 2023). The benefits of Zero Budget Natural Farming are: zero chemical usage, less water requirement, low cultivation cost, facilitate income throughout the year, reduced risk, improve food and nutrients security, increase in family income, climate friendly, and increase consumer access to healthy food (Mishra, 2018). In Himachal Pradesh, approximately 2.22 lakh farmers have adopted natural farming (H.P. Economic Survey, 2025-26).

Objectives

The objectives of the study were to:

1. To compare cost, returns and profitability between natural and conventional farming based on existing studies.
2. To examine the challenges faced by farmers under natural farming.

Methodology of the study

The present study is using previously collected data, papers, and documents from the field of economics to conduct this research using a secondary method. The paper is based on secondary or desk research and comprises data that has already been tried and tested. Existing relevant data is systematically collected and collated. The data includes literature published in journals, research dissertations and government reports etc. The study is selecting those papers which are published in high reputed journals indexed under SCOPUS, Web of Sciences, UGC- CARE and NAAS. The study reviewed those papers that were related to cost, returns, profitability and challenges associated with the adoption of natural farming system.

Literature review/ main discussions

1. Cost, returns and profitability of natural and conventional farming

Andow and Hidaka (1998) reported that rice crop grown under natural farming was less affected by pest attack and disease and recovered better after damage as compared to conventional farming system in Jap-

an. So, yield loss was lower in natural farming and more in conventional farming. Burke et al. (2015) reported that higher quantity of fertilizers had not always profitable in many cases such as: commercial fertilizers and maize production. There was a need to diversifying government policies to increase crop production in Zambia. Liverpool Tasie (2017) reported that if farmers used more fertilizers in the rice crop, then they faced low yield response due to high fertilizer price, high transportation cost and low selling price for rice in Sub- Saharan Africa.

Kumar et al. (2019) reported that cost of cultivation and crop yield was low in natural farming as compared to natural farming system in Karnataka and Andhra Pradesh. Shyam et al. (2019) reported low yield, low cost of cultivation, and higher price under natural farming system in Andhra Pradesh. Koner and Laha (2020) reported that farmers experienced the reduction in per hectare cost of cultivation and crop yield but increase in the income under natural farming as compared to conventional farming in the Purulia district of West Bengal. Bharucha et al. (2020) reported that zero budget natural farming had reduced cost, improved yield and farm health through the use of non- synthetic inputs under the irrigated maize and cotton in Andhra Pradesh. Rao et al. (2021) reported that the cost of cultivation was increased due to intensive labour involvement under natural farming system. The crop yields and gross returns were also reduced under natural farming as compared to conventional farming in the Vizianagaram district of Andhra Pradesh.

Laishram (2020) reported a decrease in the cost of cultivation, increase in crop yield and increase in gross returns under natural farming as compared to conventional farming in Solan district of Himachal Pradesh. Chandel et al. (2021) reported that multi- cropping was the reason to increase the income of farmers and reduced the risk of yield loss. It helped farmers to reduce direct cost and increase crop yield. The net returns were highest in natural farming as compared to conventional farming in Kangra, Una, Shimla, Mandi and Kinnaur districts of Himachal Pradesh. Vashisht (2021) reported that the overall cost of cultivation and crop yield of selected crops were lowest in natural farming as compared to conventional farming. Laishram et al. (2022) reported that the cost of cultivation was highest in conventional farming as compared to natural farming system. Natural farming was more cost-effective and environmentally friendly. The net returns of all crops were high in natural farming as compared to conventional farming in mandi district of Himachal Pradesh. Chandel et al. (2023) reported that natural farming had lower cost of cultivation and higher return as compared to conventional farming system Shimla, Kullu, Kinnaur, Mandi and Chamba districts of Himachal Pradesh. Kumar et al. (2024) reported that the cropping intensity was high under natural farming and total cost of cultivation was low. There had also higher net income and low yield under natural farming system in Mandi District of Himachal Pradesh. Yadav et al. (2025) reported that natural farming had higher yield, lower cost, and higher net returns in vegetables and pulses as compared to conventional farming Kangra district of Himachal Pradesh.

2. Challenges under natural farming

Rao et al. (2021) reported that the major challenges faced by the farmers in the Vizianagaram district of Andhra Pradesh were: preparation of amruthas and astras, lack of non- availability of SPNF inputs, lack of skill to prepare natural inputs, difficulty in weed management and Intensive labour requirements. Balla and Goswami (2022) reported that the challenges faced by rice growing farmers of Andhra Pradesh were: higher labour cost, followed by lack of experience, low fertile soil, high incidence of pests and diseases, non- availability of water, lack of cattle to prepare inputs, decline in crop yield, lack of skilled labour, non- availability of bio- inputs in the market, lack of awareness, increased market distance, lack of training,

lack of technical knowledge, price instability, small landholding, lack of extension services, and complication in certification process.

Laishram (2020) reported that major challenges faced by farmers were: high wage rate, labour intensive farming, non- availability of specialized market, lack of knowledge etc. Vashisht et al. (2021) reported that the factors effecting the adoption of natural farming in Sirmaur District were: chemical fertilizers cost, gross returns from natural farming, experience in farming, total farm size, decrease in pest attack, increase in soil fertility and low cost of production under natural farming. the major problems faced by farmers were: non- availability of specialized markets, followed by labour intensive farming and unfair price for the production in the market. Vashisht (2021) reported that major constraints faced by farmers in zone 1 of Himachal Pradesh were: animal attacks, market acceptance, and water management, and constraints faced in zone 3 of Himachal Pradesh were: limited knowledge and training, financial constraints, and lack of extension services. Chandel et al. (2021) reported that the conventional farming faced different challenges such as: decline in factor productivity, inadequate and imbalanced use of nutrients, low water and nutrient use efficiency, depletion in natural resources, increased the cost of inputs etc. Laishram et al. (2022) reported that the problems and challenges faced by farmers in solan district were: unfair price in the market, irrigation facilities, lack of specialized markets for the produce, higher wage rates and lack of training facilities. According to the Garret ranking technique, the major problems of the natural farmers were: labour intensive, followed by higher wage rate, non- availability of specialized market, shortage of skilled labour, knowledge of package of practices, consumer awareness of natural farming produce, lack of extension facilities, unfair prices for produce in the market, lack of transportation services and irrigation facilities etc. Thakur et al. (2023) reported that the problems faced by farmers under natural farming in mandi district were: lack of premium prices, lack of awareness of natural farming produce among consumers, labour- intensive farming, low yields, and incidence of diseases and pests. Sharma et al. (2025) reported that the major problems faced by farmers in Kangra and Solan districts were: labour- intensive, followed by shortage of skilled labour, higher wage rates, lack of market information, non- availability of specialized markets, low productivity of naturally grown crops, inadequate information regarding Subhash Palekar natural farming, unfair price of produce in the market, non- availability of raw material, lack of certification, lack of irrigation facility, consumer unawareness regarding natural farming produce, and lack of extension services. Yadav et al. (2025) reported that major challenges faced by farmers were: limited market access and labour intensity. Kumar et al. (2025) reported that natural farmers faced marketing challenges such as: lack of market access, no fair price and inadequate government support in the Mandi district of Himachal Pradesh.

Key findings of the study

- Rice under natural farming had less affected by pest attacks and diseases and recovered better after damage in Japan.
- Yield loss was lower in natural farming as compared to conventional farming in Japan.
- High quantity of fertilizers had not profitable for maize production in Zambia.
- Farmers faced low yield due to due to high fertilizers price, high transportation cost and lower selling price for conventional rice in sub- Saharan Africa.
- There was a reduction in the crop yield under natural farming in but one study shows that increase in crop yield under irrigated maize and cotton in Andhra Pradesh.

- There was a reduction in cost of cultivation but one study shows that there was an increase in cost due to higher labour involvement in Andhra Pradesh.
- There was an increase in net income due to reduction in cost of cultivation.
- One study shows that there was a reduction in gross returns due to higher labour cost.
- There was a reduction in cost of cultivation under natural farming but one study showed that there was an increase in cost of cultivation in Himachal Pradesh.
- Some studies showed that there was an increase in crop yield but some studies showed that there was a decrease in crop yield under natural farming system in Himachal Pradesh.
- There was an increase in farmers income, gross returns, and net returns under natural farming in Himachal Pradesh.
- The challenges faced by the farmers in Andhra Pradesh were: lack of non- availability of SPNF inputs, lack of skill to prepare natural inputs, difficulty in weed management and Intensive labour requirements, higher labour cost, lack of experience, low fertile soil, high incidence of pests and diseases, non- availability of water, lack of cattle to prepare inputs, decline in crop yield, lack of awareness, increased market distance, lack of technical knowledge, price instability, small landholding, lack of extension services, and complication in certification process etc.
- The challenges faced by farmers in Himachal Pradesh were: high wage rate, labour intensive farming, non- availability of specialized market, chemical fertilizers cost, unfair price for the production in the market, animal attacks, lack of training facilities, shortage of skilled labour, lack of transportation services, incidence of diseases and pests, low productivity of naturally grown crops, lack of adequate information regarding Subhash Palekar natural farming, non- availability of raw material, lack of certification, lack of irrigation facility, decline in factor productivity, inadequate and imbalanced use of nutrients, low water and nutrient use efficiency, depletion in natural resources, and inadequate government support. One study reported that the adoption of natural farming was influenced by the experience in farming, total farm size, increase in soil fertility and low cost of production under natural farming.

Conclusion

This study compares the natural farming and conventional farming on the basis of costs, returns and profitability and examine the challenges which are faced by farmers under natural farming system. The study used the secondary data from the existing literature on state, national and international level. The study found that the cost of cultivation is declining under natural farming due to low inputs cost. So, the natural farming is better than conventional farming system on the basis of cost. There have contradictory results found for the crop yield. Most of the studies shows that there has reduction in the crop yield but some studies shows that crop yield has increased. So, the crop yield has depended upon the particular region. The gross returns have also deceased, but net returns have increased under natural farming system. literature shows that higher quantity of fertilizers had also not profitable in many cases. The challenges faced by farmers in natural farming are mostly related to labour, market and natural farming inputs. The major challenges faced by farmers are: higher labour cost, low yield, non- availability of specialized markets, unfair price in the markets, preparation of natural inputs, lack of training and knowledge, animal attacks.

Policy implications

1. There has a need to increase in training and extension services to improve farmers' knowledge and skill regarding natural farming.
2. There has a need to research and development to deal the problem of crop yield.
3. There has a need to specialized markets where natural farmers sell their products.
4. There has a need of fair price for the produce.
5. There has a need of government support through technical guidance, extension services and market linkages for natural farmers.

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