

# Sustainable Farming Systems vs Conventional Agriculture: A Socioeconomic Approach

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**Abstract:** *Intensive-type farming, through the application of high-input systems that offer an increased yield, is known as conventional agriculture. This term is broadly used in the international literature to describe intensive farming. Over the last two decades, attention in industrialised countries has focused on reducing pollution by fertilisers and synthetic pesticides in conventional agriculture. The concern of society for the environmental problems caused by conventional farming, in combination with the increased demand for achieving sustainability in the agricultural sector and for safe, high-quality foodstuffs, has led to the emergence of alternative farming systems in recent years. Especially, the increasing consumers' concern about food safety and environmental pollution escalated the value of Sustainable Farming Systems (SFS), such as Organic and Integrated Farming Systems or Integrated Crop Management (ICM).*

**Keywords:** Conventional Agriculture, Pollution, High-Quality Food, Alternative Farming Systems, SFS AND ICM.

## 1. Objectives

- To protect and enhance the environment and natural resources.
- To obtain the desired quantity and quality of fields and economic viability and competitiveness.

## 2. Introduction

Sustainable agriculture is a natural way to produce food and has a number of social, economic, and environmental benefits. Intensive-type farming, through the application of high-input systems that offer an increased yield, is known as conventional agriculture.

Over the historical backdrop of human settlements in the world earth, horticulture has changed in the developing population and its difficult necessities.

The change has been striking since the finish of World War II. Food and fiber efficiency saved up because of reception of new innovations viz, HYV, from motorization, expanded compost and pesticide use, particular cultivating rehearses, water asset advancement and further developed water system practices and Government arrangements that inclined towards boosting the Green Revolution and it came to function in non-industrial nations, particularly India.

It prompted the fulfillment of independence in food grain creation. This has been depicted by Donald plunkett, logical counselor to the CGIAR, as the best farming change throughout the entire existence of mankind, and its greater part has occurred during our lifetime. The change was achieved the ascent of Science-based agribusiness which allowed higher and more steady food creation, guaranteeing food solidness and security for a continue developing total populace'. A significant issue was that these advantages have been inadequately disseminated'.

Many individuals have passed up a major opportunity hunger actually perseveres in many regions of the planet. In

any case of modernization has been a significant contributing component, in that the innovations have been all the accessible to the good Escalated type cultivating, through the utilization of high-input frameworks that offer an expanded yield, is known as regular horticulture. This term is extensively utilized in the global writing to depict concentrated cultivating.

Industrialized nations has zeroed in on diminishing contamination by manures what's more, engineered pesticides in customary horticulture.

The worry of society for the natural issues brought by customary cultivating in mix with the expanded interest for accomplishing manageability in the rural area and for protected top calibre staples, has prompted the development of elective cultivating frameworks lately.

Particularly, the rising purchasers' anxiety about food handling and natural contamination raised the worth of Sustainable Farming Systems (SFS, for example, Natural and Integrated Farming Systems or Integrated Crop Management (ICM).

SFS is a framework that can advance noteworthy human utility, more prominent productivity of asset use and an offset with the climate which is positive for people and most different species (Harwood).

The vital supportability is the capacity to adjust to future likely changes. Practical agribusiness alludes to a horticultural framework that is biologically strong, monetarily feasible, and socially. The goal of both natural and incorporated cultivating frameworks is the accomplishment of manageability.

These practical cultivating frameworks are to make the climate a basic piece of the creation cycle in order to respect the legitimate utilization of regular assets and to offer confirmations for the nature of created groceries.

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**Integrated crop management**

It is controlled and appropriate utilization of rural synthetic compounds and manures which is accomplished through a blend of organic and substance development strategies having subsequently the decrease in input costs.

As indicated by IOBC (international association for organic control) Integrated Crop Management (ICM) is a cultivating framework which incorporates normal assets and guideline systems into cultivating exercises to accomplish most extreme substitution of off-ranch inputs and gets reasonable creation of high quality food through environmentally liked and safe advances. It additionally supports ranch pay, lessens the wellsprings of natural contamination presently created by farming furthermore, keeps up with the numerous elements of horticulture.

ICM needs more designated R&D inside the current warning framework, while regular cultivating depends to the customary R&D and warning framework with respect to kind of specialized help which is accessible for natural and ICM versus regular ranchers in Greece, coordinated cultivating has fostered an extensive organization of logical help by the private area and more designated R&D inside the current warning framework.

Going against the norm, natural cultivating has depended to the guidance given by private certificate bodies and the restricted job of the public area, not having prevailed with regards to fostering a significant R&D and warning framework. It ends up, from, as a matter of fact the aftereffects of this exploration, to be the fundamental repressing variable in the choice to take on natural cultivating.

The certification of natural items in Greece is administered by a public certificate body (AGROCERT) under the Ministry of Rural Development and Food, which should be met by the private certificate bodies that are really directing natural ranches. Concerning incorporated cultivating, notwithstanding there is no normal legitimate structure in the EU which tough situations every country to satisfy normal guidelines for the accreditation of results of coordinated cultivating frameworks.

AGROCERT delivered two public guidelines (AGRO 2-1 and 2-2.) in which all the certificate necessities are portrayed exhaustively. In the EU-27, the all out area of supportable cultivating frameworks has now surpassed 12.1 million hectares, 55% of which is the portion of natural and 45% the portion of coordinated crop the board.

In Greece, natural cultivating covered an area of 69,201 hectares and coordinated administration an area of 29,232 hectares, comparing to 2.2% and 1% separately of the all out horticultural region of the country. The portion of super durable harvests is especially high comparable to add up to developed region and incorporates natural product trees, olive trees and plants, developed under natural or coordinated administration framework. Peach trees possess around 30% of the absolute region under incorporated administration, trailed by the development of olive trees (27%).

Various harvests that are in effect naturally delivered in Greece, for example, cereals, scrounge yields, olive and organic product trees. In any case, the main yields from a financial and natural perspective are olives, plants and organic product trees (for example peaches). In Greece, natural cultivating has proactively been executed for a long time and incorporated cultivating for a considerable length of time.

A critical increment of region under Sustainable Farming Systems was seen in the whole execution period. The force of fundamental harvests at every locale, comparative with the utilization of synthetic sources of info, is a significant reception variable of the two frameworks.

Subsequently, natural cultivating is applied mostly at districts with less escalated crops and coordinated cultivating is applied fundamentally at areas with more concentrated crops, similar to peach crop that requires numerous utilizations of synthetic sources of info.

An essential boundary for the financial outcome of natural cultivating is the particular endowments for natural harvests, gave inside the system of the Common Agricultural Policy.

Incorporated cultivating in many nations of the European Union, brings about lower variable creation cost, basically because of the decreased costs for rural pesticides and manures. As respects the cost of items, its increment is the exemption instead of the standard in the EU. The cost of ICM items, in most of frameworks, doesn't contrast from the cost of important customary items. Regardless, notwithstanding, there is a benefit connected to the showcasing of these items and this reality, in the long haul, may emphatically affect gross pay.

Gross profit remains almost the same as conventional farming in 44.4% of integrated farming systems, it is increased due to the non-variable gross income and the reduced variable production cost (which is mainly related to the reduced cost for pesticides and fertilisers) in 22.2% of systems and it is reduced in 33.4% of integrated farming systems (European Commission).

Additionally, it is noticeable that while economic incentives have played a significant role in inducing some managers of farms to adopt sustainable farming systems, there are others who grow organic even in the absence of subsidies.

Managers of organic farms can be of at least four types: organic hopefuls, frustrated, pragmatic, and committed, each having a shared viewpoint but giving expression to it in different ways. Managers of conventional farms can be of at least two types: never really considered organic farming or have seriously considered it.

A review of the literature on the decision making process concerning the adoption or not of organic farming does not reveal a clear dominance of economic or environmental motives.

### Economic Motives

Research results indicate the significance of economic motives in the decision to switch from conventional to organic farming.

It has been noted, in Germany for example, that producers turning organic, do so motivated by economic rather than environmental factors (Bruckmeieretalit) appears that in the UK as well, with prices of organic produce being higher than prices of conventional output by about 50 to 100%, higher income from the sale of organic produce is a significant motivation to adopt organic farming practices (Lampkin. and Measure).

Another research finding supporting this argument indicates that about 1/3 of organic farmers intend to switch to conventional farming, if the financial support given to organic farming be withdrawn (Fairweather and Campell).

On the contrary, other results underline farmers' environmental consciousness as a major motive for the adoption of organic farming. In several countries, research shows that organic farmers rank environmental protection higher than economic returns.

The protection of natural resources is a parameter that affects farmers' decision to adopt organic farming as they are interested in maintaining soil quality at a high level .

In addition, they appear to show great awareness in matters of environmental pollution, degradation of water resources due to conventional farming and the existence of residues in foodstuffs.

Meanwhile, an ideological framework for organic farming is emerging and can be seen as a guiding paradigm for the expansion and dynamic development of the agricultural sector .

In studying the ideological motivation of organic farmers, reference must be made to an objective laid down by organic farmers concerning their self sufficiency and autonomy from the agricultural input industry.

In a research carried out in Ireland it was found that producers are primarily motivated by ideology when switching to organic farming .In the Netherlands, the majority of producers who turned organic were mainly motivated by their beliefs regarding a notion of ecosystems.

However, in recent years the ideological undercurrent characterising organic farming seems to be fading away The knowledge about the negative effects of conventional farming on the health of producers and consumers constitutes a significant motivation for farmers to adopt organic farming methods. Farmers' apprehension in Norway about the negative implications conventional farming has on the quality of life and social welfare led to the adoption of organic farming .

### Meaning of Sustainable Agriculture

Manageable Agriculture alludes to a scope of methodologies for resolving numerous issues that impact farming. Such

issues incorporate loss of soil efficiency from unreasonable soil disintegration and related plant supplement misfortunes, surface and ground water contamination from pesticides, manures and residue, approaching deficiencies of non-inexhaustible assets, and low ranch pay from discouraged item costs and high creation costs. Moreover, "Practical" suggests a period aspect and the limit of a cultivating framework to persevere endlessly.

The administration of assets for horticulture to fulfill changing human necessities while keeping up with or upgrading the (Natural asset base and staying away from ecological debasement).

A supportable Agriculture is an arrangement of farming that is resolved to keep up with and safeguard the agribusiness base of soil, water , and climate guaranteeing people in the future the ability to take care of themselves with a sufficient stock of protected and healthy food'

A Sustainable Agriculture framework is one that can endlessly fulfill needs for food and fiber at socially adequate, financial and climate cost.

Major factors effecting the ecological balance and sustainability of agriculture resources are:

- a) Land/soil related issues
  - Soil degradation
  - Deforestation
  - soil disintegration
  - Wind erosion
- b) Irrigation related issues
  - water logging
  - Soil salinization and alkalization
  - Over-exploitation of groundwater
- c) Indiscriminate utilization of agro-chemical compounds
  - Compost contamination
  - Pesticide contamination
- d) Environmental contamination
  - Greenhouse effect
  - Depletion emission
  - Methane emanation

### Current idea of manageable horticulture

A Current idea of supportable Agriculture in the United States showing the closures and the method for accomplishing them through low-input strategies and talented administration.

A definitive objective or the finishes of practical horticulture is to foster cultivating frameworks that are useful and beneficial, save the regular asset base, safeguard the climate, and upgrade wellbeing and security, and to do as such over the long haul.

The method for accomplishing this is low info strategies and gifted administration, which try to improve the

administration and utilization of inner creation inputs (i.e., on-ranch assets) in manners that give OK degrees of maintainable harvest yields and domesticated animals creation and result in monetarily beneficial returns.

This approach stresses such social and the board rehearses as harvest revolutions, reusing of creature composts, and preservation culturing to control soil disintegration and supplement misfortunes and to keep up with or upgrade soil usefulness.

Low-input cultivating frameworks try to limit the utilization of outside creation inputs (i.e., off-ranch assets), like bought composts and pesticides, any place and at whatever point possible and practicable: to bring down creation costs: to stay away from contamination of surface and groundwater: to diminish pesticide deposits in food: to lessen a rancher's general gambland to increment both present moment and long haul ranch benefit.

One more justification behind the emphasis on low-input cultivating frameworks is that most highinput frameworks, sometime, would presumably fizzle since they are not either monetarily or ecologically manageable over the long haul.

#### **Conventional farming**

Conventional farming is usually contrasted to organic farming (or sometimes sustainable agriculture or permaculture), as these respond to site-specific conditions by integrating cultural, biological, and mechanical practices that foster cycling of resources, promote ecological balance, and conserve biodiversity.

Rather than using synthetic fertilizers, pesticides, growth regulators and livestock feed additives, organic farming systems rely on crop rotation, animal and plant manures as fertilizers, some hand weeding and biological pest control.

Some conventional agriculture operations may include limited polyculture, or some form of Integrated Pest Management. (See: Industrial organic agriculture).

#### **Advantages and disadvantages**

Any newly developed technology will have positive and negative consequences. If we analyze the positive and negative aspects of the way that we produce food, perhaps we will be able to improve upon the good things, and reduce the negative impacts. With conventional farming it is possible to produce much larger quantities of food, on less land and with less manual labor than ever before in history.

With rising food costs and millions of people starving all over the world, it seems like we have a moral obligation to use conventional methods to produce large amounts of food at affordable prices. However, because many of the effects of conventional farming are unknown, and because of how many of the effects may be irreversible and harmful, it may be safer to stick to what we have been doing for hundreds of years. It may be considered irresponsible to continue using pesticides, irradiation and GMO's when we really don't know what the side effects are.

#### **Ecology**

There is a common perception that organic farming is more ecologically sustainable than conventional farming. As a result of industrial farming conditions, today's mounting environmental stresses are further exacerbated, including: Water pollution, including fertilizer runoff causing eutrophication and Chemical leaching

There are many factors in how sustainable farming practices are, besides use of artificial chemicals. E.g.: Land degradation, Erosion, Soil compaction, Transport used - not just distance, but the type of transport, Water usage (including declining water table)and Loss in biodiversity.

#### **Human health**

Organic foods are usually assumed to be healthier than conventionally-produced foods. Hundreds of studies have attempted to assess the whether conventionally-produced foods have different health effects from organically produced ones.

Potential conflicts of interest have been identified in both of these cases, as the institutions involved with these studies have received funding from agriculture business interests in both the conventional and organic sectors.

Many supporters of organic agriculture rely on personal experiences and beliefs when choosing organic over conventionally produced food. "Although, as scientists, we may deplore the fact that people are swayed by non-scientific views, the fact is that a lot of them are. Despite the arguments presented by Trewavas, many people believe that organic production systems produce better food, care more for animal welfare and are kinder to the environment,".

#### **Yield**

It is generally recognized that conventional farming produces a higher amount of food than organic. One meta-study found organic yields to be on average 80% that of conventional, but the organic yield gap significantly differed between crop groups and regions.

Organic yields are typically lower than conventional yields. But these yield differences are highly contextual, depending on system and site characteristics, and range from 5% lower organic yields (rain-fed legumes and perennials on weak-acidic to weak-alkaline soils), 13% lower yields (when best organic practices are used), to 34% lower yields (when the conventional and organic systems are most comparable).

Modern farmland is claimed to produce 200 percent more wheat than the same area did 70 years ago. Hence switching to organic farming would lead to a reduction in output, e.g. by 20% for corn.[9] The figure is plausible, but we need more than one unattributed figure.

#### **Biodiversity**

Several studies have compared the local biodiversity of conventional and organic systems. A meta-study at the Swedish University of Agricultural Sciences concluded,



"Organic farming usually increases species richness, having on average 30% higher species richness than conventional farming systems. However, the results were variable among studies, and 16% of them actually showed a negative effect of organic farming on species richness. [...] Birds, insects, and plants usually showed an increased species richness in organic farming systems. However, the number of studies was low in most organism groups (range 2–19) and there was significant heterogeneity between studies. On average, organisms were 50% more abundant in organic farming systems, but the results were highly variable between studies and organism groups. Birds, predatory insects, soil organisms and plants responded positively to organic farming, while non-predatory insects and pests did not. The positive effects of organic farming on abundance were prominent at the plot and field scales, but not for farms in matched landscapes.

### Social and economic aspects

A study regarding agricultural knowledge distribution from Cardiff University found that, "the conventional food chain tends to distribute knowledge towards input suppliers, and the organic food supply chain distributes knowledge back towards the farm," due to their differing economic features.

### 3. Outcomes

An expansive and ordinarily acknowledged meaning of economical Agriculture is as per the following:

Feasible Agriculture alludes to an agrarian creation and appropriation framework that:

- Accomplishes the joining of normal organic cycles and controls
- Secures and restores soil fruitfulness and the normal asset base
- Diminishes the utilization of nonrenewable assets and bought (outer or off-ranch) creation inputs
- Improves the administration and utilization of on-ranch inputs
- Gives on satisfactory and reliable ranch pay
- Advances an open door in family cultivating and ranch networks
- Limits unfriendly effects on wellbeing, security, natural life, water quality and the climate.

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