# Chapter-1 The Prologue

By default, Indian agriculture has been and gone organic so far, and shall continue to remain organic on posterity, in between, there has been a history of mechanized and chemicalized farming that contributed to a rhetoric, called 'Green Revolution''. The advent of modern chemicalized farming made a vista by destroying classical fabrics of Indian agriculture. Today, Punjab state, the main contributor of green revolution in India, has to retain today 43 per cent of its ground water, severely contaminated with heavy metal toxicity and with a process of salinization of its fertile agricultural field. The effect of heavy metal toxicity has been ruthlessly reflected in the public health reality to count on thousands of cancer patients and to name Vatinda express, a train leading to Mombay hospital, the Cancer Express. The erosion of top soil, amounting approximately to 5-9 ton per ha. per year, can be attributed to the unplanned mechanization inflicted in Indian farms ; and at the same time, keeps creating humongous stress on ground water reserve of India (433 Cubic Kilometer). This has been an effect of irrigation based farming system with high intensity of ground water depletions as well as high level of prodigality in energy consumption. The present publication offers a splendid work on organic farming in West Bengal, where in, more than 120 blocks are under the clutch of arsenic

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contamination. This is to depict the village level reality, which can be extrapolated to greater Indian condition as well. This book will be of great help to the extension professional . Agricultural Academia, ecologists and the policy makers. The term organic farming has so far gone both by rhetoric and operation. The agrarian civilization has been organic by default until 1960s in India. The Indian agriculture started revolutionizing and modernizing with the magic combination, seed-fertilizer-irrigation, to usher the much needed green revolution. It was accelerated beyond control as much as to mitigate the socio-political crisis emerging out of imminent famines. And the imported concept of extension education, imitated from the Land Grant College model of U.S. So, our fabrics of tradition based organic farming and its eco-friendly package of practices started withdrawing to offer welcoming cushion to modern vis-a-vis chemicalised agriculture.

The revisit of organic farming and its extension paradigm have been to transfer our farm ecology from energy extravagant to energy conserving agricultural pursuits, when done all this; focuses must be on defending the productivity and conserving the ecological health.

The global trends in agriculture, introduction of green revolution technology and market orientation, mechanization, intensification, specialization, hybridization, biotechnology and liberalization and globalization, all are favouring the expansion of the "high input monoculture intensive cropping". Although this type of agriculture development made it possible to increase production in excess of global population growth, there is increased evidence that if continued its negative

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impact on food security, nutritional security, food sovereignty, rural poverty, environment and the natural resources will outweigh the benefits (Alteieri, 2000).

Evidences from a number of experimental and field sites indicates declining growth of yields from main "Green revolution" cereals under intensive cropping on some of the better lands eg. Indo-Gangetic Plains. This intensive agriculture, exhibits a poorly structural assemblage of farm components, viz., crop enterprises and among soils, crops and animals, poor nutrient recycling, decreased efficiency of inputs and increased pollution, pesticide residues and their impact on health of people and environment. Dependence on fossil fuel energy leads to depletion of soil organic matter, which in turn contributes strongly to global warming. Low price of agriculture products were particularly beneficial to urban people but increased cost of production, this mismatch increased the poverty in rural areas. About two third of agriculture land, have been degraded to some degree in the past 50 years by erosion, salinization, compaction, nutrient depletion, biological degradation or pollution.

If we choose to continue the current patterns of resource use, we will be facing with the decline in the ability of agro-ecosystems to yield their broad spectrum of benefits from clean water to stable climate, healthy soil to healthy people, fuel wood to food crops, timber to wild life habitat.

The modern farming systems aim at maximizing production through the use of increased quantities of external inputs such as fertilizers and plant protection chemicals without due consideration to their ill effects. Consequently, the traditional agronomic practices such as green manuring,

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use of farm wastes either as such or after composting and other soil ameliorative measures have not become part of the farming systems. This has resulted in a slow but steady decline in the productive and productivity of the soil.

About 70 per cent of pesticides are being used in developing countries and remaining 30 per cent in developed countries. More than 1000 agrochemicals are being manufactured and used for agriculture as well as public health purposes. About 90 per cent of this quantity is comprised of insecticides and herbicides with about equal share each. Fungicides represent about 10 per cent of the total. Use of pesticides in India is increasing at the rate of two to five per cent per annum and is about three per cent of total pesticides used in the world. About 90,000 metric tonnes of technical grade pesticides are currently produced and more than 67 per cent is used in agriculture sector alone (Nigam and Murthy, 2000).

The use of fertilizer and pesticides is increasing in the process of adopting high yielding varieties (HYV) and hybrids without giving attention towards proper dosages and methods of application and waiting periods. This is gradually leading to many hazardous effects on environment and human beings. These hazards are of different kinds with different intensity. There are many articles supporting the issue that the pesticide residues are found in every day diet and in the human body which may cause severe health hazards.

Indiscriminate use of high analysis fertilizers has caused several problems on farm as well as outside farm. Plants become more susceptible to pests and diseases and their control could be effectively done by using high

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potency poisonous chemicals. As a result, their residue on plants and in the soil had lead to health hazards (Malathi and Bangarusamy,2001). Similarly, excess nitrogen as nitrate and phosphate leached through the soil and entered natural sources of drinking water also responsible for health hazards. The chemical exerts the detrimental effects in plants for reduction in germination, retardation in seedling growth, scorching and increased susceptibility to diseases (Asha et al., 2001). Methemoglobinemia (blue baby disease) in infants, cancer and respiratory illness in human beings, eutrophication and plant toxicity due to excessive availability of inorganic and organic nitrogen in surface water and soil (Addiscot, 1996).

Extensive application of pesticides to monoculture crops over number of years give rise to new pest species from insects which previously had no significant impact upon the crop. This phenomenon arises from the ecological imbalance caused by the destruction of predator insets and consequent removal of natural control on potential pest species (Biju, 2001). Out of 329 million hectares of India's total geographical area, more than 50 per cent is degraded or considered as problematic. Serious water and wind erosion 141.25 m.ha, acidic soils 4.50 m.ha, alkali soils 3.50 m.ha, and saline soils 5.50 m.ha., are some of the most problematic soils in India (Latha and Chellamuthu, 2001).

In order to mitigate these health hazards and bring out natural balance and protection of ecosystem, organic movement has started in several parts of the world, in which no chemical fertilizer and plant protection chemical is used in the cultivation of field crops, vegetables and fruits. It is ascertained that the indiscriminate use of agro-chemicals and pesticides cause adverse

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changes in the ecological balance. This calls for reorientation towards ecofriendly farming as a remedial measure.

The important eco-friendly technologies worthy of mentioning are organic farming, natural farming, traditional farming, sustainable farming, biodynamic and pharmaculture, which may be all together considered as ecofriendly farming. United States Department of Agriculture (USDA, 1980) has defined eco-farming (organic farming) as a production system, which precludes the use of synthetic fertilizers, pesticides, growth regulators and livestock feed additives. It rather relies more upon crop rotation, crop residues, animal wastes, legumes, green manure, farm wastes, mechanical cultivation and biological pest management.

The Less Intensive Farming Environment (LIFE) has already shown that the use of chemicals in farming can be substantially cut without loss of profit. Thus, eco-friendly technologies promise a great hope for minimizing the chemical hazards and restoration of ecological balance.

Koshy (2000) opined that in the coming years, our goal should be to develop eco- friendly technologies for attaining the production goals while ensuring sustainable use of natural resources and high efficiency of inputs.

Research in the field of agriculture has identified several environmental friendly technologies, of which mention can be made about eco-farming, eco-friendly pest management and eco-friendly nutrient management. The eco-farming utilizes most efficiently the traditional practices of crop rotations with legumes, tillage practices to improve soil texture, application of adequate organic matter to sustain, retain and release soil moisture, nutrient to match crop needs and correction factors of soil ill health.

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The eco-friendly pest management is viewed as a broad ecological approach to pest control employing several methods and techniques viz., cultural, mechanical, biological and chemical in a compatible manner to keep the pest level below economic threshold.

The eco-friendly nutrient management involves the use of bulk organic nutrient base like FYM, press mud, green manure, earthworm meal, plant residues such as coir pith, sugar cane thrash etc., in combination with several agronomic practices.

Several of these eco-friendly practices have recommended in organic farming and eco-friendly farming are not known to many farmers in developing and less developed countries. The Rio earth summit on environment movement (1992) emphasized the importance of environmental education.

Eco-friendly farming helps to avoid chain reaction in the environment from chemical sprays and dusts, helps to prevent environmental degradation and can be used to generate degraded areas. It improves soil physio-chemical properties, reduces the need for purchase inputs, organically grown corps are believed to provide more healthy and nutritionally superior food for man and animals and plants are more resistant to pests and diseases than those grown with commercial fertilizers (Paliniappan and Annadurai, 1999).

The farmers who are pursuing eco-friendly farming are called eco-friendly practicing farmers and have proven to the world that, their farming system is distinguished form other agriculture systems and above all is competitive and able to provide agricultural products of good quality while minimising negative side effects.

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It is very well recognised that vegetables plays a major role in environmental pollution. This is evident by the fact that vegetables are succulent and short duration crops. There by it consumes large amount of pesticides next to cotton.

There is no adequate and proper documentation of the efforts made by such farmers. As a result, not much literature is available to other farmers about such practices. Farmers lack ready-made packages to jump into such alternative farming methods, their fear and doubts such about efforts are kept unanswered.

# 1.1: General objectives

To estimate the economic, ecological and productivity estimation in organic farming.

# **1.2: Specific objectives**

Empirical studies have been hardly conducted on economic, ecological and productivity estimation on organic farming in Coochbehar district. Hence, it was felt necessary to study the management aspects of organic farming and a study was designed with the following specific objectives-

- Delineation of concept and operational meaning of organic farming.
- Identification of variables, dependent (Y) and independent (X) implicating on the factor production in organic farming.
- To estimate the interaction between dependent and independent variables as much as to predict the efficacy of independent variables on the productivity, biological, social and economic; of organic farming.

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• To delineate some strategic implications leading to a policy implication in organic farming.

### **1.3: Limitation of the present research**

Some limitations of the study are:

- The no. of variables could have been more selective and higher by count.
- A close comparison between organic farming and non-organic farming could have depicted otherwise with more number of discriminant statistics.
- The no. of respondents could have been more to increase the explicability of variance.
- The subtle difference between organic and inorganic farming, in terms of degree or intensity, should have been spelled clearly so that the elements of confusion can be removed.

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