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Current Status of Organic Farming in India and other Countries

Organic farming is being practised in 100 countries of the world. The ill-effects of chemicals used in agriculture have changed the mindset of some consumers of different countries who are now buying organic with high premium for health. Policy makers are also promoting organic farming for restoration of soil health and generation of rural economy apart from making efforts for creating better environment. The global organic area is 26 million hectare roughly along with 61 standards and 364 certification bodies roughly. The world organic market is now 26 billion US$. The organic area in India is 2.5 million hectare including certified forest areas. Non-certified organic area is more than certified organic area. India has developed National Standard under NPOP programme. The National Centre of Organic Farming under Ministry of Agriculture is promoting organic farming as facilitator across the country and providing various assistance to organic entrepreneurs and farmers.

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ORGANIC FARMING IS GAINING gradual momentum across the world. Growing awareness of health and environmental issues in agriculture has demanded production of organic food which is emerging as an attractive source of rural income generation. While trends of rising consumer demand for organics are becoming discernible, sustainability in production of crops has become the prime concern in agriculture development.

HISTORICAL PERSPECTIVE

ALTHOUGH THE TERM 'organic farming' is getting popularity in recent times, but it was initiated in 10000 years back when ancient farmers started cultivation depending on natural sources only. There is brief mention of several organic inputs in our ancient literatures like Rigveda, Ramayana, Mahabharata, Kautilya Arthasashthra etc. In fact, organic agriculture has its roots in traditional agricultural practices that evolved in countless villages and farming communities over the millennium. Major milestones in the area of organic farming are presented in **Tables 1** and **2**.

a) Review of chemical use in agriculture

The world foodgrain production is to the extent of 2100 million tonnes roughly which is generally based on farming where adequate use of fertilisers and pesticides are in practice. The fertiliser use (kg/ha) in Korea, Japan, Netherland, Bangaladesh, Germany, India are 357, 247, 172, 158, 153 and 89 respectively **(Table 3)**.

The logic behind the mineral fertiliser use is:

i) Plants require 17 essential nutrients;

ii) Regardless of sources, including organic, plant absorbs nutrient in an inorganic form e.g.

Nitrogen (N) $\longrightarrow$ NH_4^+, NO_3^-

Phosphorus (P) $\longrightarrow$ HPO_4^{-2}, $H_2PO_4^-$

Potassium (K) $\longrightarrow$ K^+

So, attempting to separate organic and inorganic is difficult and fertilisers are essential.

iii) There is scientific evidence that plant

Table 1 - Historical perspective of organic farming

Ancient period	
Oldest practice	10000 years old, dating back to Neolithic age, practiced by ancient civilization like Mesopotamia, Hwang Ho basin etc.
Ramayana	(All dead things – rotting corpse or stinking garbage returned to earth are transformed into wholesome things that nourish life. Such is the alchemy of mother earth – as interpreted by C. Rajagopalachari).
Mahabharata (5500 BC)	Mention of *Kamadhenu*, the celestial cow and its role on human life and soil fertility.
Kautilya Arthashastra (300 BC)	Mentioned several manures like oil cake, excreta of animals.
Brihad-Sanhita (by *Varahmihir*)	Described how to choose manures for different crops and the methods of manuring.
Rig Veda (2500-1500 BC)	Mention of organic manure in Rig Veda 1, 161, 10, 2500-1500 BC, is Green Manure in Atharva Veda II 8.3, (1000 BC). In Sukra (IV, V, 94, 107-112) it is stated that to cause healthy growth the plant should be nourished by dungs of goat, sheep, cow, water as well as meat. A reference of manure is also made in *Vrksayurveda* by surpala (manuscript, oxford, No 324 B, Six, 107-164)
Holy Quran (590 AD)	At least one third of what you take out from soils must be returned to it implying recycling or post-harvest residue.

uptake inorganic nutrient and crop has its demand **(Table 4)**.

iv) Organic farming implies large scale requirement of organic fertiliser which is difficult to obtain.

v) Organic fertiliser may also contain heavy metal **(Table 5)** if it is purchased from outside.

vi) Intensive farming to meet food demand of huge population exhausted native soil fertility, so fertiliser use cannot be ignored.

vii) Integration of inorganic and organic is ideal model

viii) Dr. Norman Borlaug, the father of Green Revolution is of the opinion that organic agriculture cannot increase agricultural productivity (10).

In the green revolution era throughout the world, the use of plant protection chemicals including all pesticides like fungicides, insecticides, weedicides were used extensively to protect plant from pest and diseases. The use of pesticide (kg/ha) in USA, Japan, Korea, China, India are 1.50, 10.80, 16.60, 2.25 and 0.38, respectively. The arguments behind using pesticide is that with the intensive agriculture, the problems of insect pests and disease are taking complex shape and posing serious challenges. So the use of pesticides during last a few decades, has emerged as one of the essential agro-inputs to increase and sustain crop yields.

b) Could we not avoid use of pesticides?

Scientific surveys and evidences indicate that particles of pesticides, sprayed or used over crops leave undissolved and harmful elements which are transferred to human and other living bodies through grains, vegetables, fruits and grasses, causing a number of diseases, ailments and harmful effects on our health (2). The indiscriminate use of pesticide concerns the presence of pesticide residues in our foods. According to WHO, 14000 people die every year in the third world countries due to pesticide poisoning. Its immediate effect has appeared on environment and ecosystem also. Large scale death of birds is reported every year. According to study by CCS Haryana Agricultural University,

Table 2 - Key milestones on organic farming in current period

Sir Albert Howard (1900-1947)	father of modern organic Agriculture, developed organic composting process (mycorrhizal fungi) at Pusa, Samastipur, India and published document " An Agriculture Testament".
Rudolph Steiner (1922)	a German spiritual Philosopher built biodynamic farm in Germany.
J.I. Rodel (1950), USA	popularized the term sustainable agriculture and method of organic growing.
IFOAM	Establishment of 'International Federation of Organic Agriculture Movement", in 1972
One Straw Revolution	Release of the book by Masanobu Fukoka (1975), an eminent microbiologist in Japan.
EU Regulation	EU Regulation on Organic Food, 1991
Codex	Codex guideline on organic standard, 1999.

Table 3 - Status of fertiliser consumption per hectare of agricultural land (2002-03) of some selected countries and their population

S.No	Countries	Fertiliser use (kg/ha)	Population (billion)
1.	Korea	357	0.004
2.	Japan	247	0.012
3.	Netherlands	172	0.001
4.	Bangladesh	158	0.014
5.	Germany	153	0.008
6.	Pakistan	109	0.014
7.	UK	106	0.005
8.	India	89	1.049
9.	China	71	1.302
10.	USA	47	0.030
11.	Australia	5	0.001
12.	World	28	6.224

Source : (9)

Table 4 - Average nutrient uptake by crops per tonne of economic yield

Nutrient	Unit	Uptake per tonne of yield production				
		Paddy	Wheat	Groundnut	Tea	Tobacco
N	kg	20.0	25.0	58.0	110.0	16.5
P_2O_5	kg	11.0	9.0	20.0	37.8	4.4
K_2O	kg	30.0	33.0	30.0	44.0	26.2
S	kg	3.0	4.7	5.7	10.1	2.8
Ca	kg	7.0	5.3	28.0	31.0	22.6
Mg	kg	3.0	4.7	7.3	10.7	4.8
B	g	15	48	133	200	96
Cu	g	18	24	15	240	11
Fe	g	153	624	1500	900	692
Mn	g	675	70	118	5900	132
Mo	g	2	2	4	na	0.6
Zn	g	40	56	28	240	21

Source: (21)

Table 5 - Total concentration of selected heavy metals in manures (ppm as dry wt. basis)

Source	Arsenic	Cadmium	Chromium	Lead	Nickel	Copper
Cow manure	-	08.0	58	16	29	62
Poultry manure	0.35-110.5	-	0.6-19.6	-	-	3.5 to 13.5

Source: (5)

the pesticide residue persistence in agricultural produce, food commodities **(Table 6)**, animal, feed, fodder, animal products, irrigation water **(Table 7)** are matter of serious concern as their presence is more than maximum residue limit (MRL) of PFA, 1954 **(Table 8)**.

c) Do the plants require mineral fertiliser?

Before dealing this sensitive issue, we can extend out look on the following facts:

i) Creation of earth = 5 billion (500 crore) years back

ii) First life started = 2 billion (200 crore) years back

iii) Initiation of plants = 0.5 billion (50 crore) years back

iv) Appearence of man = 2 million (20 lakh) years back

v) Prehistoric man started cultivation = 10000 years back

vi) Development of fertiliser concept =

a) J.B.Boussingault (French Chemist, 1840)

b) Justus Von Liebig, 1840 (German chemist)

vii) First Global Fertiliser Industry = Single Super Phosphate (SSP), 1842, Rothamsted Expt. Station, London

viii) First Fertiliser Industry in India= SSP Factory, Ranipet (1906), Tamil Nadu

ix) History of Fertiliser = 100-160 years only

x) Why Fertiliser Needed = For cell growth, protein synthesis, root development, good biomas etc. (4)

The organic activators are not happy with fertiliser input which is the output of 100-160 years only. They are also not convinced with the logic that the use of fertiliser is essential for cell growth, protein formation etc. as lot of plants (Jamun, Ashoka etc.) or roadside or on hill side or on desert or forest are surviving with huge biomass years after years without use of any fertiliser. The organic groups are also of the view that :

i) Promotion of mineral fertiliser is the brain of industry only.

Table 6 - Pesticide residue persistence in agricultural produce and food commodities

Commodity	2001		2002	
	Samples(no.)	Contamination	Samples(no.)	Contamination
Vegetables* (17 crops)	712	61 12% above MRL	529	63.5 8.5% above MRL
Fruits** (12 crops)	378	53 (Less than MRL)	329	47 (approaches MRL)

* At Hisar all contaminated – 46% above MRL, Heptachlor and Cypermethrin
** Fields in Faridabad – Vegetables, fruits, flowers highly contaminated
MRL = Max. residue limit
Source : (6)

Table 7 - Pesticide residue persistence in animal feed, fodder, animal products, irrigation water

S.No.	Commodity	Samples(no.)	Contamination (%)	Major residue recorded	Year of testing
1	Feed and fodder	125	81.0	HCH, DDT, Chloropyri- phos, Endosulphan	2001
2	Milk	537	52.0	94% HCH, 9% Endo-sulphan, DDT residue	2001
3	Butter	184	67.4	-do-	2002
4	Irrigation water				
	a) General water				
	b) Surface water	258	60.0	HCH, DDT	2001
	c) Canal	251	73.0	Endosulphan Chloropyri-phos, 4 above MRL	2001
	d) Pond	10 11	All All	-	2001

Source : (6)

Table 8 - Maximum residue limits (MRL) of pesticides on food commodities [Prevention of Food Adulteration Act (PFA), 1954]

S.No	Name of pesticide	Food	Maximum residue limit (MRL) (mg/kg)
1	Aldrin	Foodgrains, milk, vegetables	0.01, 0.15, 0.10
2	Captan	Fruits & vegetables	15.00
3	Carbendazim	Foodgrains, vegetables, milk	0.50, 0.50, 0.10
4	Carbofuran	Foodgrains, fruits/vegetables, milk	0.10, 0.10, 0.05
5	Chloropyriphos	Foodgrains, fruits, cauliflower	0.05, 0.50, 0.01
6	DDT	Milk/milk product, fruits/vegetables	1.25, 3.50
7	Endosulfan	Fruits/vegetables	2.00
8	Heptachlor	Foodgrains, vegetables	0.01, 0.055

Source : (7)

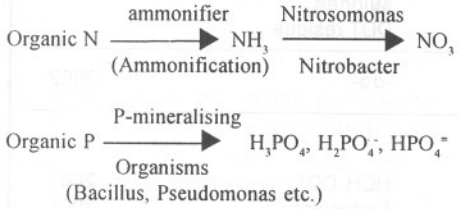
ii) Crop produced with chemicals not good for health, contains heavy metals **(Table 9)** causes several diseases due to excess NO_3, NO_2 and it polluted environment **(Table 10)**

iii) The compound annual growth rate in yield of important crops in India is going to decline gradually even after use of chemicals **(Table 11)**

iv) The efficiency of fertiliser is not more than 50% **(Table 12)** and the remaining is huge loss.

v) The industrial nitrogen fixation (INF) is 40 mt/year which contributes only 15.3% of total nitrogen fixation. On the other hand, the quantity of biological nitrogen fixation (BNF) is 175 mt/year which contributes 67.3% of the total amount.

vi) Plant also uses nutrients from organic sources through mineralisation and billions of microorganisms are available in soil for this job.



vii) Excess and indiscriminate use of inorganic fertiliser has deteriorated soil badly with deficiency of macro and micronutrient.

viii) Organic produce contains more vitamins, minerals, enzymes, trace elements and even cancer fighting anti-oxidants than conventionally grown food. In a two years study as made in western suburbs of Chicago, it has been observed that the average levels of minerals were much higher in the organically grown than in the conventionally grown food. Calcium is 63% higher, Iron 73%, Magnesium 118%, Molybdenum 178%, Phosphorus 91%, Potassium 125% and Zinc 60% (12).

ix) The productivity of organic farming may be less in initial years, but the yields increased progressively under organic farming equating the yields under

Total 9 - concentration of selected heavy metals (ppm on dry wt. basis)

Sources	Arsenic	Cadmium	Lead	Nickel
Urea	< 0.04	< 0.2	<0.4	<0.2
DAP	9.9-16.2	4.6-35.5	2.1-3.7	7.4-222
MOP	0.4	<0.2	<0.4-10	<0.2
TSP	10.3	15.0	11	17

Source : (5)

Table 10 - Adverse effects of nitrogenous fertilisers on human health and environment

Effect	Causative agents
Human health	Excess NO_3 and NO_2 in water and food
Methemoglobinemia cancer	Nitrosoamine illness from NO_2, secondary amines, peroxyacyl nitrate
Environmental health Environment	Excess NO_3 in feed & water
Eutrophication	Inorganic and Organic N in surface water
Materials and ecosystem damage	HNO_3, aerosols in rainfall

Source : (2)

Table 11 - Compound annual growth rate in yield of important crops in India

Crops	1980-81 to 1989-90	1990-91 to 1999-2000
Rice	3.19	1.27
Wheat	3.10	2.11
Maize	2.09	1.69
Total Cereals	2.90	1.58
Total Pulses	1.61	0.96
Total Foodgrains	2.74	1.52
Total Oilseeds	2.43	1.25
Sugarcane	1.27	0.95
Cotton	4.10	-0.61
Total Non-foodgrains	2.31	1.04
All Principal crops	2.56	1.31

Source:(22)

Table 12 - Nutrient use efficiency in India

Nutrient	Efficiency (%)
Nitrogen	30-50
Phosphorus	15-20
Potassium	70-80
Zinc	2-5
Iron	1-2
Copper	1-2

Source :(22)

inorganic farming by sixth year **(Table 13)**. A long term experiment as conducted by ICRISAT also sustains the view that yield of different crops in low cost sustainable system, the annual productivity (rainy + post rainy season yields), in particular, is comparable to that in the conventional system (19).

x) Conventional agriculture based on concept of fertilising the crop which is organic agriculture, it is for 'fertilising the soil'. Regular addition of organic fertiliser improves the soil quality **(Table 14)**. The loss of nutrient in organic manure is less due to its slow release. Further, organic standard restricts the use of off-farm organic fertiliser as it may contain pollutants. It is always better to use on farm inputs.

xi) Several biopesticides (*Trichoderma viridi*, *Bacillus thurengiensis* BT, NPV, GV etc.) botanical pesticides (Neem), biocontrol agents (*Trichogramma, Cryptolaemus, Chrysoperla* etc.) are capable of controlling pests and diseases as recorded in the study under Integrated Pest Management (IPM) programme.

xii) While organically grown products may seem more expensive, current prices for conventionally grown foods do not reflect their hidden costs borne. Even consumers need not to pay these costs right after its purchase. The cost will have to be paid by tax payers and the whole society for subsidy, foreign exchange, damage of environment etc. The organic food has high demand and it gets high premium over conventionally grown food.

Table 13 - Yields and economics of organic farming vis-à-vis conventional farming

Year	Status	Yield q ha^{-1}	Gross income	Premium (20%)	Total (Rs)	Net income (Rs)	Surplus/ deficit over conventional
Conventional	-	10	20000	0	20000	9000	0
First year	Year of conversion	5	10000	0	10000	750	-8250
Second year	Year of conversion	5.75	11250	0	11250	3750	-5250
Third year	Organic	6.25	12500	2500	15000	7000	-1500
Fourth year	Organic	7.50	15000	3000	18000	10500	1500
Fifth year	Organic	8.75	17500	3500	21000	13500	4500
Sixth year	Organic	10.00	20000	4000	24000	16500	7500

Source : (17)

Table 14 - Mean values of aggregated soils data from 16 pairs of farms each with organic (bio) and conventional (con) farming

Soil property	All "bio" farm	All "Con" farms
Bulk density (Mg m^{-3})	1.07	1.15*
Penetration resistance (0 to 20 cm) (Mpa)	2.84	3.18*
Carbon (%)	4.84*	4.27
Respiration ($\mu lO_2 h^{-1} g^{-1}$)	73.7*	55.4
Mineralizable N (mg kg^{-1})	140.0*	105.9
Ratio of mineralisable N to C (mg g^{-1})	2.99*	2.59
CEC (cmol kg^{-1})**	21.5*	19.6

* = Significantly different at $p<0.01$
** = Cation exchange Capacity in centimoles of Cation charge (=) per kilogram of soil
Source: (18)

Definition and Objectives of Organic Farming

The concept of organic farming is not clear to many concerns (16). Many people think that traditional agriculture, sustainable agriculture, Jaivik Krishi etc, are organic farming. Some people are of the idea that the use of organic manures and natural methods of plant protection instead of using synthetic fertililsers/ pesticides are organic farming. But this is not true. The organic farming in real sense envisages a comprehensive management approach to improve the health of underlying productivity of the soil (16). Earlier Lampkin (15) mentioned that organic agriculture is a production system which avoids or largely excludes the use of synthetic compounded fertilisers, pesticides, growth regulators and livestock feed additives. It relies on crop rotation, crop residues, animal manure, legumes, green manure, off farming organic waste and aspects of biological pest control (2). But the most recognised definition is as below:

The term "organic" is best thought of as referring not to the type of inputs used, but to the concept of the farm as an organisms, in which all the components – the soil minerals, organic matter, microorganisms, insects, plants, animal and humans – interact to create coherent, self-regulating and stable whole. Reliance on external inputs, whether chemical or organic, is reduced as far as possible. Organic farming is (w) holistic production system (15).

The system takes local soil fertility as a key to successful production. As a logical consequence, International Federation of Organic Agriculture Movements (IFOAM) stresses and supports the development of self-supporting systems on local and

regional levels.

Main Principle of Organic Farming

The main principles of organic farming are the followings:

To work as much as possible within a closed system, and draw upon local resources.

i) To maintain the long-term fertility of soils.

ii) To avoid all forms of pollution that may result from agricultural techniques.

iii) To produce foodstuffs of high nutritional quality and sufficient quantity.

iv) To reduce the use of fossil energy in agricultural practice to a minimum.

v) To give livestock conditions of life that confirm to their physiological need.

vi) To make it possible for agricultural producers to earn a living through their work and develop their potentialities as human being.

The four pillars of organic farming are:

1) Organic standards

2) Certification/Regulatory mechanism

3) Technology packages

4) Market network

Standard and Certification

The most important aspect in modern era of organic farming is certification programmes which consist of standards (rule), inspection (checking whether the rules are implemented) and certification (judgment). Only by this certification programme, organic farming can be distinguished from other methods of sustainable agriculture. These standards define what can be labeled 'certified organic' and sold commercially as such. Infact, certification in organic agriculture generally refers to independent third party certification. Third parts implies it is not done by either the producer (first party) or the buyer (second party). The system includes farm inspector and audit trails (checking of record). Certificate is valid only if it is done by accredited certifying agency. Certification programme vary among countries or regions because of differences in environmental, climatic, social and cultural factors. Needless to say, from a commercial perspective it is not enough that product is produced organically, what is equally important is that it should be certified as such.

Technology Packages

Conventional practices cannot be followed for growing crops organically. It includes land preparation, selection of variety, organic fertilisation, biological control of pest- diseases-weed, harvest, storage etc. Some countries have developed package of practice for some selected crops but there is ample scope to refine this package with scientific methods and practices.

Market Network

Organic farming has a place where there is a market to accept the produce at a higher price as the growing interest in organic farming practice is due to an expectation of higher premium for organically produced farm commodities. The basic focus of Organic farming should be first to produce a farm products for the home (domestic) market and second for the export market.

Global Scenario of Organic Farming

In approximately 100 countries of the world, organic farming is being practiced and the area under organic management is continuously growing (13).

Area

As per the study (2004) of the Foundation Ecology and Agriculture (known as SOEL), the global organic area is 24 million ha. The major part of this area is located in Australia (about 10 million hectares), Argentina (almost 3 million hectares **(Table 15)**) (13). Australia /Oceania holds 42% of the world's organic land, followed by Latin America (24.2%) and Europe (23%). In Africa, more than 3,20,000 hectares and 71,000 farms are managed organically, representing about 0.04% of agricultural land. The total organic agricultural area in Asia is now about 8,80,000 hectares, corresponding to 0.07% of the agricultural area. The number of organic farm is more than 61,000.

The recent (2005) survey of SOEL indicates that currently more than 26 million hectares of farmland are under organic management worldwide. The increase is almost 10% as compared to previous year. The maximum organic area is lying with Australia (11.3 million ha.) followed by Argentina (2.8 million ha)

Standard

Globally there are more than 60 standards which include IFOAM basic standards, CODEX Alimentations Commission guidelines, EU Regulation 2029/91, NOP of USA etc. **(Table 16)**.

Certification

As per Organic Certification Directory, 2003 as published by Grolink, there are 364 certification bodies across the world **(Table 17)**, but they are unevenly spread. 290 of them are located in European Union (106), USA, Japan, Canada & Brazil. There is

Table 15 - Land area of major countries under organic management (SOEL – Survey, 2004)

S.No.	Name of the country	Area under organic (m.ha)	% of total agricultural area	Number of organic farm
1	Australia	10.0000	2.20	1380
2	Argentina	2.9600	1.70	1779
3	USA	0.9500	0.23	6949
4	UK	0.7245	4.22	4057
5	Germany	0.6969	4.10	15,628
6	South Africa	0.0045	0.05	250
7	China	0. 3012	0.06	2910
8	Japan	0.0005	0.10	-
9	India	0.0370	0.03	5147
10	Pakistan	0.0002	0.08	405
11	Sri Lanka	0.0015	0.65	3301
	All World	24.0700	1.60	462475

Source: (13)

Table 16 - Some facts on international standards

1. IFOAM;	• Established in 1972 • Headquarter in Germany • Umbrella organisation for organic Agriculture Association • Developed international basic standards of organic agriculture • Established IFOAM accreditation programme (1992) to accredit certifying bodies • Set up International Organic Accreditation Service (IOAS) in July 2001
2. CODEX:	• Codex Alimentarious Commission – a joint FAO/WHO • Intergovernment body • Established in 1962 • Produced a set of guidelines for organic production
3. EU regulation	• Laid out a basic regulation for European Union's organic standards in Council regulation NO.2092/91 (June 1991) • Regulations give guidelines for the production of organic crops in the European Community.
4. Demeter	• Demeter International is a world wide net work of 19 International certification bodies in Africa, Australia, Europe • Developed guideline for biodynamic preparation.
5. JAS	• A set of guidelines 'Japan Agricultural Standards' for organic production

Source : (13)

Table 17 - Certification bodies and their approval per region

Region	Total	IFOAM	Japan	ISO 65	EU	USA
Africa	7			1		
Asia	83	4	65	1	1	2
Europe	130	10	9	45	100	28
Latin America/ Caribbean	33	4		10	5	8
North America	101	4	1	14		64
Oceania	10	4	6	3	6	4
Sum	364	26	81	74	112	106

Source (13)

Table 18 - Global organic market – A brief review

1. Organic market share = 1% of total food sales

2. Global market
   - (i) 2000 = 17 billion US $
   - (ii) 2003 = 25 billion US $
   - (iii) 2004 = 26 billion US $
   - (iv) 2005 = 31 billion US $ (expected)

3. Value of organic food sales
   - (i) USA = 8000 million US $
   - (ii) Germany = 2100 million US $
   - (iii) UK = 1000 million US $
   - (iv) Italy = 1000 million US $
   - (v) France = 850 million US $
   - (vi) Switzerland = 450 million US $

4. Organic export in India = 15.5 million US $ (2003) (710 million Indian Rupees)

IFOAM accreditation programme, launched in 1992, by initiating International Organic accreditation service (IOAS).

Market

The current (2004) world organic market is estimated at over US $ 26 billion cultivated on a total area of around 24 million hectares world wide **(Table 18)**. It will reach 31 billion US $ by 2005. Premiums on most organic products range between 35-100%. Organic products are almost entirely (over 95%) consumed in developed countries. The major producers and importers of organic products are EU, USA and Japan. Categories of major organic products include fresh fruits and vegetables (non tropical and tropical), cereals (wheat, rice, corn, maize), coffee, tea, cocoa, spices, herbs, oilseeds, pulses, milk product, honey, meat, edible nut, semi-processed fruits etc.

Organic Farming in India

(1) Background: The Indian Agriculture is traditionally organic and farmers were following organic cultivation till the middle of the last century (1950). The Green Revolution was ushered in India during sixty and it has been the cornerstone of India's agricultural achievement, transforming the country from the stage of food deficiency to self-sufficiency. During the period, the production of food grains has increased four folds, from 50.82 mt in 1950-51 to 212.05 mt on 2003-04. But indiscriminate and excessive use of chemicals during this period has put forth a question mark on sustainability of agriculture in the long run calling attention for sustainable production which will address soil health, human health and environmental health and eco-friendly agriculture. Organic farming appears to be one of the options for sustainability. Starting of organic agriculture in India in 1900 by Sir Albert Howard, a British agronomist in North India, Development of Indore Method of aerobic compost (Howard, 1929), Bangalore method of anaerobic compost (Arcaharya, 1934), NADEP Compost (ND Pandari Panda, Yeotmal, 1980) initiated organic agriculture in India.

The year 2000 is very important year for India from organic point of view. The four major happenings were made during the year 2000. These are:

- The Planning Commission constituted (2000) a steering group on agriculture who identified organic farming as National challenge and suggested it should be taken in the form of a project as major thrust area for 10th-plan. The group recommended organic farming in NE Region, rain fed areas and in the areas where the consumption of agro chemicals is low or negligible.

- The National Agricultural Policy (2000) recommended promotion of traditional knowledge of agriculture relating to organic farming and its scientific upgradation.

- The Department of Agriculture and Cooperation (DAC), Ministry of Agriculture constituted (2000) a Task force on organic farming under the chairmanship of Shri Kunwar Ji Bhai Yadav and this task force recommended promotion of organic farming.

- The Ministry of Commerce launched the National Organic Programme in April 2000 and Agricultural and Processed Food Products Export Development Authority (APEDA) is implementing the National Programme for Organic Production (NPOP) (11). Under the NPOP, documents like National standards, accreditation criteria for accrediting inspection and certification agencies, Accreditation procedure, inspection and certification procedures have been prepared and approved by National Steering Committee (NSC).

India Advantage

India is endowed with various types of naturally available organic form of nutrients in different parts of the country and it will help for organic cultivation of crops substantially. There is diversity in climates-100-10,000 mm rainfall, hill, desert, strong traditional farming system- crop-tree-animal, innovative farmers, vast dry lands (60% agriculture land), least use of chemicals. Infact, the rain fed, tribal, north east and hilly regions, of the country where negligible chemicals used are practicing subsistent agriculture for a long period. These areas are organic by default. As regards the availability of major organic nutritional inputs (NPK) in India, the estimate of National Centre of Organic Farming, Ghaziabad (3) is as follows:

a) Crop residue = 3.865 million tonnes
b) Animal dung = 3.854 million tonnes
c) Green manure = 0.223 million tonnes
d) Biofertiliser = 0.370 million tonnes

Besides, there is enough scope of using biodynamic preparation, vermicompost, *Amrit Pani* etc. on on-farm production basis.

Area

It is estimated that there are around 76,000 ha of Organic Farm land (certified) in India and 2.4 million hectare certified forest area for collection of wild herbs. But the actual area under organic is more. The State of Uttarachal and Sikkim have declared their states as organic states. In Maharashtra, since 2003, about 5,00,000 hectares is under organic farming (of the 1.8 crore ha of cultivable land in the state). Of this, 10,000 ha is certified area. The organic area in Karnataka is as below :

Year	Certified area (ha)	Non-certified area (ha)
2002	990.30	-
2003	1090.25	-
2004	1467.98	2845.20
2005	1513.25	4750.00

The Govt. of Karnataka has released State Organic Farming Policy in 2004. Most of the area in NE-Zone are being practiced with organic farming. In Nagaland, 3000 ha (Chessore, Shamaster) are under organic farming with crops like Kholar, Maize, Ginger, Soybean, large cardamom, passion fruit and chilly. The State of Rajasthan has 5631.3 ha organic with unique cropping pattern **(Table 19)**. The states like Tamil Nadu, Kerala, Madhya Pradesh, Himachal Pradesh, Gujrat are promoting organic farming vigorously.

Standard

Under NPOP programme, the Govt. of India has developed National Standard for organic export. The Ministry of Agriculture, in principle, has accepted this standard for domestic purpose also. The scopes of these standards are:

- Lay down policies for development and certification of organic products.
- Facilitate certification of organic products confirming to the National Programme containing the standards for organic production.
- Institute a logo and prescribe its award by accrediting bodies on products qualifying for bearing India organic label.

A National Steering Committee (NSC) comprising Ministry of Commerce, Ministry of Agriculture, APEDA, Spices Board, Coffee Board, Tea Board and various other Government and private organisations

Table 19 - Organic farming status in a state
A case study of Rajasthan (2004-05)

S.No.	Name of district	Cropping pattern (since organic farming in practice)	Number of farmers	Organic area (ha)
1	Dungarpur	Pulses-cereals, Cereals-cereals, Cereals-pulses	105	52.0
2	Tonk	Moong-wheat, Bajra-mustard, Til-wheat	132	590.0
3	Nagour	Guar-cumin, Guar-wheat, Moong-mustard	54	63.0
4	Ganganagar	Cotton-wheat	41	24.0
5	Bhilwara	Urd/moong-wheat	30	12
6	Jaisalmer	Bajra	20	50.0
7	Bharatpur	Bajra-wheat	96	38.4
8	Jhunjhunu	Pulses-wheat	14	11.2
9	Alwar	Wheat-bajra	29	26.0
10	Banswara	Maize/cotton-grass/fallow	4752	4045.0
11	Jaipur	Guar/bajra-mustard-wheat	9	13.7
		Total	5282	5631.3

Table 20 - List of accredited certifying and inspection agencies in India

S.No.	Name of certifying & inspection agencies	Address	S.No.	Name of certifying & inspection agencies	Address
1	Association for promotion of Organic Farming (APOF)	Alumni Asso. Building, Bellary Road, Hebbal, Bangalore – 560024 Ph.080-23516060	7	Bioinspectra	C/o Indocert, Thottumugham, P.O. Aluva – 683105 Cochin, Kerala State Ph.0484-2630908
2	Indian Society for Certification of organic products (ISCOP)	"Rasi Building" 162/163, Ponnaiyaraja-puram, Coimbatore, Tamil Nadu – 641001, Ph.0422-2471181	8	SGS India Pvt Ltd	250, Udyog Vihar, Phase-IV, Gurgaon-122015 Ph. 0124-2399757
3	Indian Organic Certification Agency (INDOCERT)	Thottumugham P.O. Aluva-683105, Cochin, Kerala State, India Ph 0484-2630909	9	LACON	Mithradham, Chunangardi
4	Skal Inspection and Certification Agency	Mahalaxmi Layout, No.191, 1st Main Road, Bangalore-560086	10	International Resources for Fair Trade (IRFD)	Sona Udyog Unit No. 7 Parsi Panchayat Road Andheri (E) Mumbai 400069 Ph:022-28235246
5	IMO Control Pvt. Ltd.	26, 17th Main HAL, 2nd 'A' Stage, Bangalore-560008 Ph. 080-25285883	11	One Cert Asia	Agrasen Farm Vatika Road Off Ton Rd., Jaipur, Rajasthan
6	Ecocert International	54A, Kanchan Nagar, Nakshetrawadi, Aurangabad – 413002, Maharashtra 0240-2376336	12	National Organic Certification Association (NOCA)	Pune

associated with the organic movement is monitoring the overall organic activities under the National Programme for organic production (NPOP).

This year NPOP standard has got equivalency with the standard of EU commission. Now Indian Standard is acceptable in European Countries. Efforts for equivalency with NOP (USA) is under process.

Certification Bodies

There are 12 accredited certifying agencies in the country and the list is presented in **Table 20**. Tentative tariff structure (8) for certification is as below:

- Travel and Inspection: Rs.12000 – Rs.19000 per day (depending on small farmers, cooperative, estate manufacturers, large and medium sized processors).
- Report preparation: Rs.5000/-
- Certification: Rs.5000/-

Market

As regards market, India is in a very nascent stage when it comes to exports of organic produce. During 2004-05, the total organic export was 6472 metric tonne with approximate value of Rs. 80-90 crore where the maximum product came form Kerala (1232 metric tonne) **(Table 21)**. Around 5500 metric tonne (86%) of the exported produce are exported to the country **(Table 22)**. Some organisations have already come up for promoting domestic market **(Table 23)**. The International competence Centre, Bangalore organized National organic trade fair on 4th – 7th November, 2005 at Bangalore where more than 300 organic producers gave stall and 10000 farmers visited everyday during the programme which indicates the existence of domestic organic market in India.

Table 21 - India organic : An overview (2004-05)

1.	Area under certified	=	2.5 million ha
2.	Total certified product	=	115,238 metric tonne
3.	Total project certified	=	332
4.	Number of processing units	=	158
5.	Accredited Inspection and certifying agencies	=	11
6.	Number of products exported	=	35
7.	States involved in organic export		
	(i) Kerala = 1232 metric tonne		
	(ii) West Bengal = 937 metric tonne		
	(iii) Karnataka = 476 metric tonne		
	(iv) Tamil Nadu = 471 metric tonne		
	(v) Punjab = 541 metric tonne		
	(vi) Himachal Pradesh = 521 metric tonne		
	(vii) Maharashtra = 375 metric tonne		
8.	All India total organic export	=	6472 metric tonne
9.	Premium collected against organic export	=	Rs. 80-90 crore (tentative)

Source :(1)

Government Policy on Promoting Organic Farming

The policy of Ministry of Agriculture seeks to promote technically sound, economically viable, environmentally non-

Table 22 - Export of organic produce from India to the EU (2003/2004)

Product	Quantity (tonnes)	Product	Quality (tonnes)
Tea	1,997	Cashew nut	126
Pineapple	1,320	Walnut	89
Spices	625	Fruit	46
Honey	526	Cotton	26
Rice	432	Pulses	12
Sesame seed	354	Sugarcane	8

Source : (1)

degrading, and socially acceptable use of natural resources in favour of organic agriculture. The policy seeks to actualize the area and crop potential for strengthening rural economy, promoting value addition, accelerating growth of agro-business and securing a fair standard of living for the farmers and agricultural workers and their families.

Area Approach and Crop Identification

For promotion of organic farming, identification of potential areas and crop is crucial. The Government strategy to promote organic farming for the crops having market potential like fruits, spices, oilseeds, pulses, vegetables, wheat, cotton, basmati rice, etc. As far as potential areas are concerned, three priority zones have been identified.

Category-I

The top priority areas for promotion of organic farming are the rainfed areas where fertililser and agro-chemical consumption is already very low.

Category-II

The Category II areas are primarily under rainfed farming with little irrigation support.

Category-III

The last priority areas are those with moderate to heavy use of fertililsers and pesticides, mostly multiple cropped area.

The list of districts having fertiliser consumption below 25 kg/ha is given in **Table 24**.

Apart from promoting organic farming in low consumption area, rainfed area, dryland, hill area etc., some efforts are also being made in high intensive cropping area like Punjab, Haryana, etc. for organic farming. But it requires sufficient study to assess its acceptability in these areas.

National Project on Organic Farming

The Department of Agriculture and Cooperation (DAC), Ministry of Agriculture, Government of India has launched a new Central Sector Scheme 'National Project on Organic Farming' with an outlay of Rs. 57.05 crore for production, promotion and market development of organic farming in the country during the 10th Plan on pilot basis with the following components:-

National Project on Organic Farming

(Rs. In lakh)

S.No.	Components	Xth Plan	
		Physical target	Financial outlay
1.	Establishment of NCOF/RCOFs	-	829.00
2.	Capacity building through service provider	300	900.00
3.	Setting up of production units-		
	i) Fruit/vegetable compost units	35	1400.00
	ii) Biofertiliser units	30	600.00
	iii) Vermiculture hatcheries	2000	300.00
4.	Training (on certification, input production, extension etc.)	400	258.00
5.	Field demonstration	3920	896.00
6.	Market development and promotion	-	522.00
	Total		**5705.0**

Table 23 - Some agencies involved in domestic Marketing of organic produce in India

S.No.	Name of the organisation	Address	S.No.	Name of the organisation	Address
1.	NAVDANYA Trust	A-60, Hauz Khas, New Delhi-110016	8.	FAB India Overseas Pvt. Ltd.	B-26, Okhla Industries Area, Phase-I, New Delhi
2.	Devine Agro Industries Ltd	C-9, Anoop Nagar, Uttam Nagar, New Delhi -59	9.	ECO-Nut Health Food Shop	J's Heritage Complex, Opp. Milk Union, P.T. Road, Kodai Kanal- 624101
3.	Devbhoomi	Rajpur Road, Dehradun, Uttaranchal	10.	Sresta Byproducts Pvt. Ltd.	203, Pavani Annexes, Road No.2, Banjara Hills Hyderabad 500034, AP, India
4.	Back to Nature	Near Kanak Cinema, Dehradun, Uttaranchal	11.	D.R. Agro organicAS	01, Sai Nagar, Ratnagiri, Kapadganj – 387620, Gujarat
5.	Mahrishi Ved Vigyan Vidyapeeth	Dunda (Kunshi), Uttar Kashi	12.	IOCCA	951C, 15th Cross, 8th Main, Ideal Home Township Raja Radeswari Nagar, Bangalore-560 098
6.	Institute of Rural Development (IIRD)	54 A, Kanchan Nagar, Nakshetrawadi, Aurangabad 413002	13.	Sunstar Overseas Ltd	40 K.M.Stone, GT Karnal Road, Bahalgarh, Sonepat, Haryana
7	ISCON Temple	Bangalore	14	IITC Organic India Ltd.	A-306, Indira Nagar, Lucknow – 227 105

Table 24 - List of districts having per ha. fertililser consumption under the State

National level fert. consumption (kg/ha)	State level fertiliser consumption (kg/ha)		District level fertiliser consumption (kg/ha)
	State	Consumption	District & consumption
Eastern Region			
89.8	Assam	46.60	Lakhimpur (10.1), Dhimaji (2.3), Sibsagar (9.2), Sonitpur (19.4), Golaghat (20.0), Hailakandi (26.1), K. Anglang (4.1), NC Hills (1.2)
	Bihar & Jharkhand	80-50	Shivhar (2.4)
			Madhubani (22.1), Banka (14.4), Kisanganj (16.2)
	Orissa	41.40	Bolangir (21.1), Kendrapara(25.8), Dhenkanal (18.7), Angul (22.8), Nawapara (21.5), Keonjhar (23.9) Koraput (19.2), Malkangiri (17.8) Phulbani (3.7), Sundargarh (19.0)
Northern Region			
	Jammu & Kashmir	71.40	Udhampur (23.1), Kathua (19.3), Doda (16.0), Rajouri (21.8), Leh (17.8), Kargil (17.3)
	Himachal Pradesh	49.40	Chamba (17.6), Kinnaur (19.8)
Southern Region			
	Karnataka	74.90	Bidar (21.0), Gadag (20.9)
	Kerala	63.60	Kasargod (22.1)
Western Region			
	Madhya Pradesh	55.00	Mandala (19.4), Dindhori (3.1) Seoni (21.3), Damoh (25.1), Sidhi (17.3), Shahdol (12.2), Umaria (18.2), Jhabua (15.2), Guna (24.2)
	Chhattisgarh	46.50	Korba (12.3), Jashpur Nagar(10.1), Sarguja (22.8), Korea (11.2), Jagdalpur (8.0), Dantewada (1.3)
	Maharashtra	65.70	Osmanabad (14.3)
	Rajasthan	40.50	Ajmer (18.0), Sikar(21.7), Jhunjhunu (17.7), Bikaner (13.3), Churu (1.8), Jodhpur (15.4), Jaisalmer (7.7), Jalore (18.9), Barmer (3.5), Nagaur (17.9), Pali (23.5), Jodhpur Division (14.3)

Source : Fertiliser Statistics (2003)

The project is operational since 1st October, 2004. Its Headquarters is NCOF, Ghaziabad which has 6 regional centers (RCOFs) at Bangalore, Bhubaneswar, Hissar, Jabalpur, Imphal and Nagpur.

The unique feature of this scheme is to promote group certification by capacity building through service provider where the service provider will help organic farmers by providing training, educating on record management, supervising internal control system, assisting in certification and market access. One service provider will be registered with 1500 farmers working in identical geographical condition with similar type of crop. The group certification will reduce cost of certification **(Figure 1)**.

Other Projects of MOA in Support of Organic Farming

Apart from DAC project on organic farming, the projects like 'Technology Mission on Horticulture', Cotton scheme etc. are supporting organic farming. Besides, under Macro Management programme, Government of India is supporting different State schemes on organic agriculture.

FAO-DAC Project on Organic Farming

The Ministry of Agriculture has taken up the Technical Cooperation Programme (TCP) of FAO (TCP/IND/3003 – Development of Technical Capacity Base for the Promotion of Organic Agriculture in India) to overcome the knowledge gap by quickly producing basic information tailored to various ecological zones of the country on the current state of knowledge on organic crop production packages, input production and utilisation and certification issues including legal and institutional aspects. The project is operational since April, 2005. The preparation of Technical package of practice of different crops for different regions are under process.

Constitution of Organic Expert Panel by DAC

There are many issues on crop productivity and input use under organic farming which have been raised by various concerns. To address all these issues, the Ministry of Agriculture has constituted (July, 2005) an organic expert panel under the chairmanship of Dr. H.P. Singh, Dean, GB Pant Agricultural University. The report is expected shortly. However, based on the recommendations of this Panel, the approach towards organic farming could be reviewed.

Task Force on Balanced Use of Fertiliser

The Development of Agriculture and cooperation under Ministry of Agriculture has constituted (2004) one Task Force on Balanced use of fertililser under the chairmanship of Sh. A. K. Singh, Additional Secretary. One of the terms of this task force is to suggest appropriate mechanism for encouraging use of organic manures and biofertililser for

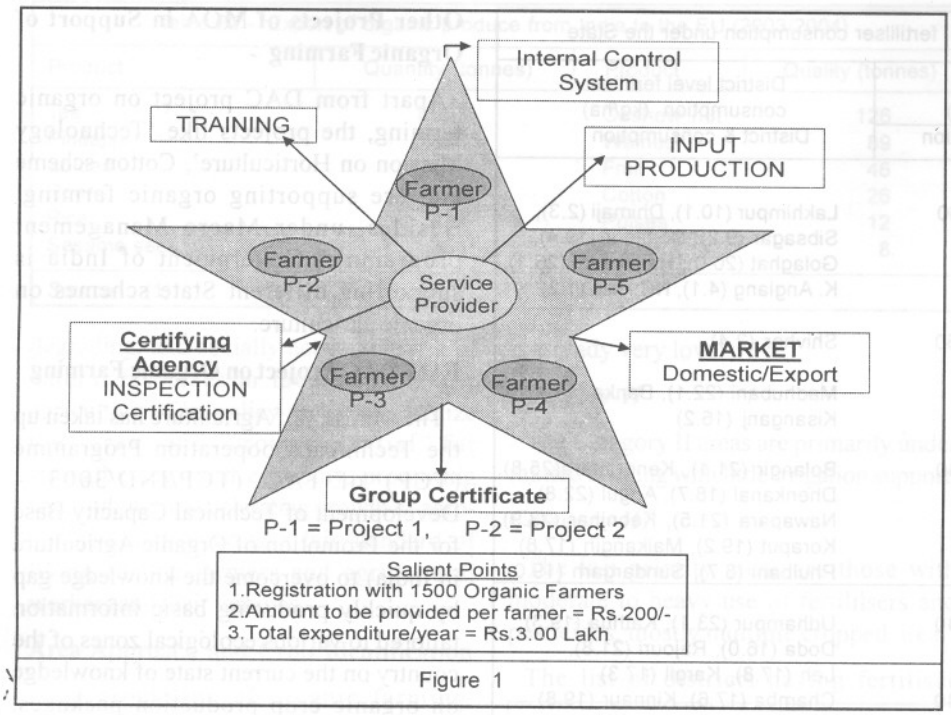


Figure 1

balanced use of fertilisers.

Organic Farming Approach by NAAS

The National Academy of Agricultural Sciences (NAAS) has issued a Policy Paper on Organic Farming, which concludes that while synthetic pesticides can be avoided, complete exclusion of fertilisers may not be advisable under all situations. NAAS recommends that a "holistic approach involving Integrated Nutrient Management (INM), Integrated Pest Management (IPM), enhanced input use efficiency and adoption of region- specific promising cropping systems would be the best organic farming strategy for India." To begin with, the practice of organic farming should be for low volume, high value crops like spices, medicinal plants, fruits and vegetables. NAAS has also emphasized the need for intensive research on soil fertility and plant health management and on issues relating to microbial contamination of food arising from the use of farm yard manures. (Organic Farming: Approaches and Possibilities in the context of Indian Agriculture, Policy Paper 30, NAAS, February 2005).

CONCLUSIONS

DURING THE LAST FOUR DECADES of the 20th Century, the global population doubled itself from 3 to 6 billion and it is estimated that by the year 2020, it will reach the 8 billion mark. It has also been noticed **(Figure 2)** the volume of population from 3000 BC to 1950 is almost same or less from 1950 to 2030. It means that the galloping explosion of population has been made during last 5-6 decades only. Food and nutritional security is therefore a serious global concern. Neither conventional farming with inorganic alone nor organic farming only with the use organic input can face this challenge. The combination of organic and inorganic is undoubtedly the best option as on today unless the existing dietary system is changed.

But organic production is coming from farmers movement and consumer choice which cannot be ignored. All facilities need to be extended to organic farmer's as they need appropriate package of practice, voluminous amounts of organic inputs and good domestic as well as export market. Organic farming should not be discouraged under any circumstances. The National Centre of Organic Farming will act as the facilitator for promoting organic agriculture. The immediate task is to arrange availability of organic inputs and low cost certification process. There is already demand from farmers that there should be separate standard and certification for domestic market. Looking to the forward direction of organic market across the world, there is no need of diluting the standards made for purely organic. But the demand for alternative standard has stemmed from the fact that the large proportion of organic farming either by default or by sustainable practice with use of negligible chemicals could not be certified as the existing standard does not permit it. As a result of it, many farmers in the country are not getting any advantage from view point of income generation. Looking to the need of alternative standard/ certification process, efforts may be made to promote organic green food or eco-friendly food (which allows the use of limited and specified agrochemicals of safe level in the line of standard made by local Public Health Department) as being practiced by China on large scale. The area belong to category II and III in India as mentioned earlier may be appropriate area for promoting organic green food under broad spectrum of organic cultivation. By this way many cultivated land can be used and transformed and environmental efficiency can be increased. But the whole process needs more study and it is ultimate choice of farmer and consumer who will finally dictate the policy for better agriculture in the country.

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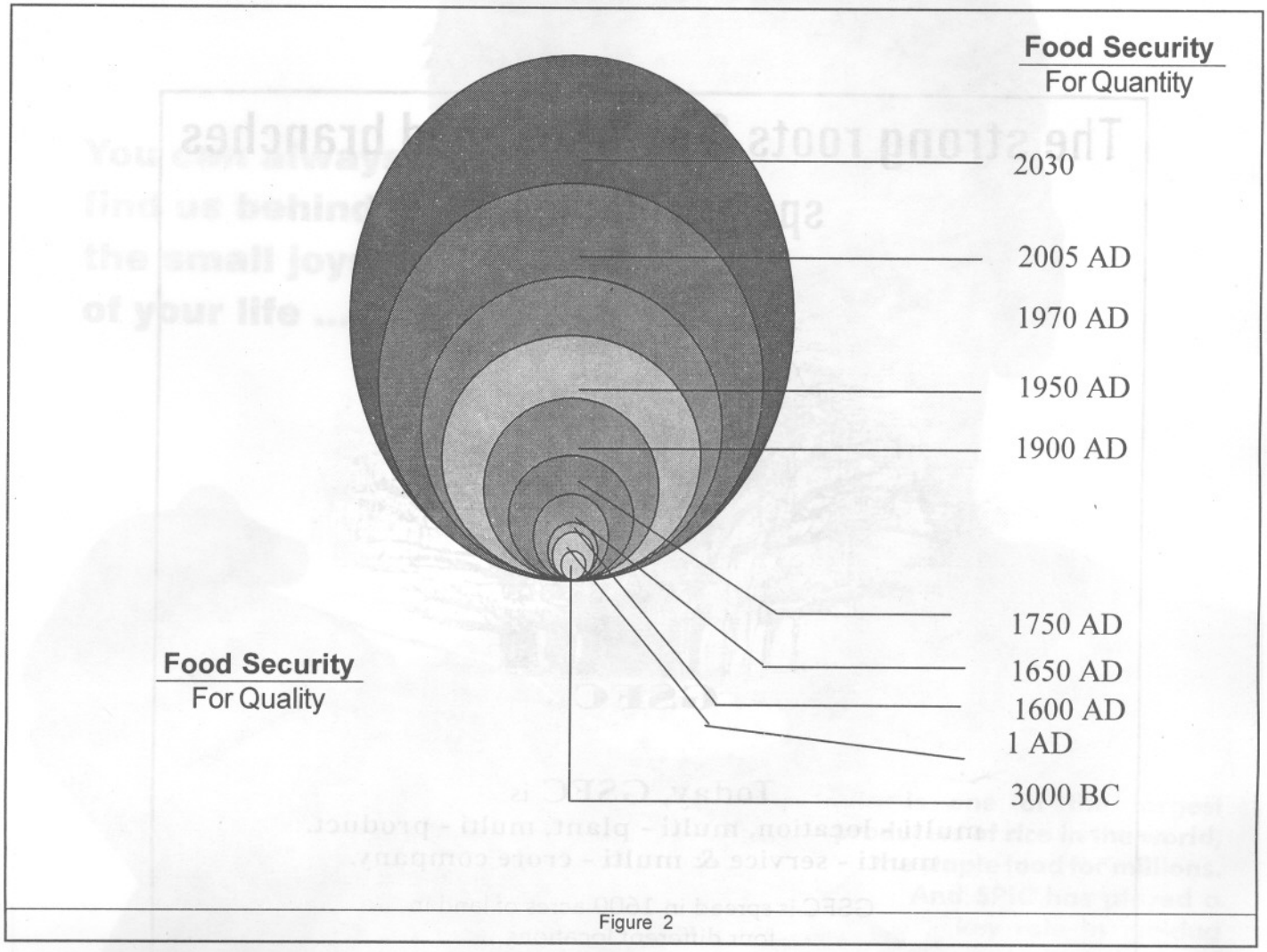

Figure 2

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