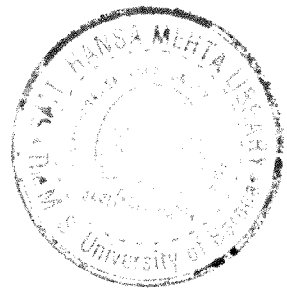

CHAPTER 1

INTRODUCTION

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Agriculture is a system of harnessing nature for the sustenance of human being. India is a country where agriculture plays an important place in the economic development of the nation. Today also 57.2% of people rely on agriculture in India (Shah, 2004).

At the global level considerable progress has been done in the field of agricultural activities. Among all developing countries, India has made much progress by increasing the production of food grains. The use of chemical fertilizers for agriculture gradually increased and spread slowly to the developing and under developing countries. India was no exception to it.

The Green revolution, launched in the mid sixties became a landmark in transformation of agriculture in India. The seed, fertilizer, plant protection, irrigation and other allied technologies of intensive nature promoted since then, made the way for a substantial increase in food production, leading to self sufficiency and even surplus for export (Ramnathan, 2006). This green revolution paid rich dividend quadruplicating food grain production from 50 million tones in 1950-51 to 211 million tones in 2001-02, which enabled India to become self sufficient in food grain. Second green revolution is also going to give boost to agricultural production and meet the requirement of 337 million tones by 2011-12. These developments simultaneously led to increase in the use of chemical fertilizers and pesticides which cause serious damage to environment and human health. Besides, secondary Stalinization, decrease in soil fertility, resistance to pesticides in insects, increase cost of production are gradual effects, which are challenging the sustainability of agriculture production at high level (BalakRam, 2003).

The fertilizer consumption in the country accordingly has increased from 66000 tones in 1951-52 to about 12.16 million tones in 1992-93 and 20.34 million tones in 2005-06. In other terms, fertilizer consumption which was only 0.5 kg/ha in 1951-52 increased to 67kg during 1992-93 (Dahama 1999).

However, over the years in the recent decades, despite the progress made earlier deceleration of growth and crop yield from green revolution technologies surfaced and caused serious concern and chain of several problems to be tackled. The cause of such serious problems was due to unscientific, uncontrolled and indiscriminate use of inputs, chemicals in the form of fertilizers, pesticides, fungicides, weedicides and growth promoters etc.

All those harmful chemicals have caused many problems. It has the consequential occurrence and accumulation of toxic chemicals residues, their metabolites and heavy metals like Hg, Pb, Cr, etc. at lethal levels in soil, water and air and ultimately entering into the food chain, causing very serious health hazards and irreparable damage to all the living beings.

It is estimated that the consumption of chemical fertilizers increased seven fold, pesticides by 375 times while the food production had just doubled during the first 20 years of the launch of Green Revolution in India (Palaniappan and Anadurai, 1999). The increased use of chemicals under intensive cultivation has disturbed the harmony existing among soil, plant and microbial population (Ghosh, 1999).

More than half of all pesticides used in Indian agriculture are banned or severely restricted in many developed countries (Agarwal, 1997). Fourty percent of the insecticides consumed in India are organochlorine pesticides (Nair,2000). These organochlorine pesticides can remain in ecosystems for 20-25 years (Joshi, 2005). It accumulates in the body of humans as well as animals without further transformation or excretion and as they move up the tropic level in the food chain, they magnify in concentration. Many of them are immunosuppressive, carcinogenic, tumorigenic mutagenic, teratogenic and cause effects like impotence and premature deliveries (Agarwal 1997; Joshi, 2005). Globally, Indian people have the largest levels of DDT accumulation in their adipose tissue (CERC 1989). Additional health hazards arise from pesticide residues in surface and underground water resources. For example, the river Yamuna, which is the source of water supply for 70% of the

population of Delhi, contains pesticides like DDT, lindane and endosulphan; some of them are carcinogen, in concentrations far above tolerance levels (Agarwal et al. 1999). Drinking water treatment plants in India are generally not equipped to decontaminate drinking water from pesticides (Agarwal, 1997; Nair 2000), In rural areas many people use underground and surface water resources directly for consumption.

Exposure to pesticides can cause a range of ill effects in humans, from relatively mild effects such as headache, fatigue and nausea to more serious effects such as cancers and neurological disorders (ICMR, 2001).

Shah (2004) indicated that in last 38 years the use of chemical fertilizers and insecticides along with the loan released by the government has increased but with this the production per hectare is not even doubled to the original production and at the same time the important resource like land is deteriorating day by day. There are reports of frustration among farmers who ended up in suffering severe losses and even ending their life. Such news items, appearing more often from Andhra Pradesh, Maharashtra, Kerala and Karnataka, have been most painful and disheartening to all the people.

Chemical agriculture and genetic engineering are threatening to public health and leading to nutrition decline. Costs of production, which includes hybrid and genetically engineered, seeds, chemicals and irrigation, are increasing with every season pushing farmers into the debt trap and also to suicides. Thousands of farmers have ended their life in India in the last two decades because of the debt. As an insurance against such vulnerability, organic farming movement help to the conservation of bio-diversity in India and built a movement for the protection of small farmers through promotion of ecological farming and fair trade to ensure the healthy, diverse and safe food.

India is going to be world's most populous country of more than 1.4 billion people by the mid twenty first century (Dyson, et.al 2004) and therefore agriculture and food security are the most important concerns of the 21st century. The growth rate of agricultural production is losing momentum.

With the increase in the country's own population, compulsion would not only be to stabilize agriculture production but also to increase it further in sustainable manner. The intensive use of input has not only polluted the soil, water and the environment causing their slow degradation, but also has affected the human beings.

The scientists have realized that the green revolution with high input use has reached a plateau and is now sustained with diminishing return and falling dividends. In this age of globalization and communication, with population explosion, highly intensive farming system Is required which does not affect natural resources and provide eco-friendly farming system. The obvious choice for this situation is the adaptation of organic farming practices without compromising agricultural production.

Today, India is not in a position to do away with the use of synthetic agro chemicals especially the inorganic fertilizers in view of the large and increasing population demand for food commodities. But through systematic use of agrochemicals and organic manure the country can move towards organic farming. Vishwanath (1937) mentioned in his presidential address at the 24th Indian Science Congress held at Chennai, that organic manure is life of the soil and if neglected the fertility of soil would not be maintained.

Organic farming:

Organic manure is an environment friendly, ecological production system that promotes and enhances biodiversity, biological cycle and biological activities. It is based on minimal use of off-farm inputs and management practices that restore, maintain and enhance ecological balance. Organic agriculture is much more than simply 'chemical free'. Producing organic crop is a commitment to a system which ensures that healthy, nutritious food can be produced year after year without environmental degradation. The primary goal of organic agriculture is to optimize the health and productivity of interdependent communities of soil life, plants and animal.

Fast shifting trend from synthetic chemical based agriculture to organic and eco friendly system of cultivation is being thought at national and global level. This shift towards organic production is getting support from the consumers who are aware of health hazards; therefore, demand of the food organically grown is increasing by 20-25% in developed countries where awareness level is comparatively high.

Research at US shows that organic products have more minerals, less water and less artificial chemicals. The organic food industry has recently seen phenomenal growth. The sale in US of all organic food have grown by 20-25% each year in the last decade and reached $7billion in 2000. Organic sales will grow to $20 billion in 2005. (www.farmingsolutions.org).

Consumer's satisfaction is directly related to food quality. Food quality itself is very difficult to define as it depends to a certain extent on one's personal taste and priorities. However quality may be defined in several different ways. From all the different definitions, different measurement methods arise, as well as different theories about how quality actually relates to consumer satisfaction. Examples of parameters possibly involved are taste, appearance, firmness, juiciness, nutrients content, contamination etc. In case of fruits and vegetables the quality changes as these products are passed along the distribution chain and the perspective of handlers or consumers depends on their position in this distribution chain as well as their personal tastes (Schewfelt 1998).

Abbot (1999) defined the term quality as "the degree of excellence of a product or its sustainability for a particular use". She described quality as "a human construct comprising many properties and characteristics. This quality of produce encompasses sensory properties (appearance, texture, taste and aroma) nutritive values, chemical constituents, mechanical properties, functional properties and defects". She also stated that "quality can be defined from either a product orientation or a consumer orientation".

Another way to evaluate food quality is by using physical or chemical analysis. It can also be evaluated by sensory evaluation of food by test panelists. By feeding animals also one can determine the food quality. Lampkin (1990) called "food quality" a very "ill-defined" concept. Taste and appearance are personal assessments. The individual consumers will have to determine themselves whether they prefer organic or conventionally grown food on the basis of their own experiences. Therefore, laboratory analysis can only provide a partial description of food quality.

Food should be very much related to the health of the human being but looking in details at the quality assessment or quality analysis carried out in recent decades, it is found that the relationship between food and human health is not really taken into account (Hoppe, 2000).

> "Health is a state of complete physical, mental, and social well-being, and not merely the absence of disease and infirmity." – World Health Organization

(http://organicfood.mytrumedia.com/article/5/why-is-natural-organic-food-better-for-your-health)

Growing crops in healthy soils using sustainable agricultural practices results in food products that offer healthy nutrients. As organic practices help to safeguard the environment and protect habitats, organic products promote species diversity.

Worthington (2001) indicated in her study of nutritional quality of organic versus conventional fruits, vegetables and grains that organic crops contained significantly more vitamin C, Iron, Magnesium and Phosphorous and significantly less nitrate than conventional crops. There were non significant trends showing less proteins but of a better quality and a higher content of nutritionally significant minerals with lower amounts of some heavy metals in organic crops compared to conventional one.

Direct health hazards from agro chemicals used as inputs in food needs to be fully established. The Times of India(1996) published result of a study conducted on nutritional difference of organic and non organic in UK which indicated that organic apples and tomatoes tended to be richer in vitamins and organic tomatoes were superior in respect of vitamin C and A.

Thus, organic farming is not just the absence of pesticides but the presence of an agricultural system that protects cropland, supports biodiversity and respects the balance of nature rather than attempting to control it with powerful other toxic synthetic chemicals.

One misconception about organic food is 'natural food is organic food', which needs to be clarified. Food may be free of artificial ingredients or natural but still grown by conventional methods. The term "Organic" on the label stands for a commitment to agriculture and therefore organic refers to not only food itself but also to how it was produced.

Many terms, such as "Pesticide free" or "Residue free" are used now by growers that sound as if they are the same as "Organic". These are unregulated labels that imply that the grower has reduced the use of dangerous pesticides but they are not the same as organic. Misleading use of any food labeling term hurts consumers and the legitimate grower and may even undercut the success of organic crops. Hence, it is essential to develop standards for organic food consumers. This can be the best guarantee for its quality. Globally there are more than 100 different organic standards and certification system in place.

International Standard Organization (ISO) defined "Certification is a system by which the conformity of products to applicable standards is determined". Organic standards are nothing but minimum requirement for a farm or product to be certified as organic. In 2000 the government of India released the National Standard of Organic Products (NSOP) under the National Programme for Organic Production(NPOP) products sold or labeled as

"Organic", thereafter need to be inspected and certified by a nationally accredited certification body.

Organic certification is a market instrument which enables the organic producer to assess a special organic market. At present this inspection is mainly from outside Asia with very high cost and sometimes with misunderstanding between the producer and inspectors. It is urgent and necessary to set up local inspection and certification programme for sustainable development of organic agriculture.

Justification of the study

The people on the earth must prevent the imbalance in ecosystem so as to get safe and healthy life. This can be achieved by organic farming system. It is the task of every Indian to nurture the land and to regenerate the soil. This is possible through sustainable farming system. Sustainability means continuous soil fertility and productivity. The organic farming is one of the most important steps of sustainable agriculture that uses methods respectful of the environment from the production stages through the handling and processing. It minimizes the use of man-made external inputs especially chemical, synthetic materials and pesticides to produce uncontaminated food of high nutritional quality and in sufficient quantity.

Organic food is today's answer not only to sustainable food production but also to the healthy and safe food. A systematic research is required in this area to get an idea about consumer's perception with respect to organic food.

A few research studies have been conducted in foreign countries such as Barbara,(1996), Worthington,(1998), William et al (2000), Jorhem and Slanina, (2000), Mitchell (2003). People are still not aware about organic food. The production of organic food is also very low and there are few outlets selling organic food, which is one of the hindrances in wide use of organic food by people. Whatever food items are available at the outlet, all are not certified as "organic". Moreover, the certification process is very expensive,

which poor farmers can't afford. In such cases while buying organic food which is not certified, consumer may have feeling of being cheated by the shopkeeper. Therefore they sometimes avoid buying organic food.

Due to lower productivity and high market price of organic food, it is not very popular among the people. The availability of organic food is uncertain which influence the buying practices of homemaker. It is the responsibility of the homemakers to provide food items, which are enhancing the health of the family members. As it is believed that organic food products may be safer for the health than the conventional food products, she should buy organic food to a greater extent.

There is a need to create awareness about the advantages of organic food among people and promote its use. There is also a need to find out the problems people face in obtaining the organic food items, so that remedial measures can be taken up. A survey of the satisfaction experienced by the consumers of organic food would reveal the aspects of with which consumers are not satisfied. This can act as a feedback to the organic food growers and providers.

The field of Home Management is concerned with the resource management at micro and macro level. Its curriculum has environment education as a core component, where various environmental problems are discussed and individuals are made aware of their responsibility towards protecting the environment for sustainable development. Since organic farming and the products are one of the ways for environmental protection, it was thought essential and relevant to conduct a study on various aspects associated with organic food. The homemakers have the prime responsibility of providing healthy food to its family members. Hence, it was thought essential to find out the extent of utilization of organic food by them.

The producers and sellers of organic food as well face difficulties. There is also a need to find out their problems so that suitable solutions can be found out. This may help them to continue producing and selling organic food.

Hence the present research was planed to survey the consumers, producers and sellers of organic food on various aspects covering their problems and satisfaction at the same time assessing the food quality of organic food and conventional food.

Statement of the problem

The present study attempts to find out the extent of utilization, problem faced and satisfaction experienced by consumers of organic food. It also attempts to assess food quality of selected items of food grown through organic farming and conventional farming method.

Objectives of the study

1. To find out various organic food items available in the market of Vadodara city.
2. To study the problems faced by the shopkeepers selling organic food.
3. To assess the extent of utilization of organic food by the consumers.
4. To study the extent of influence of various reasons to buy organic food.
5. To study extent of problems faced and extent of satisfaction felt by the consumers on using organic food.
6. To undertake case study of selected farmers growing organic food.
7. To assess the quality of selected organic food and conventional (non-organic) food.
8. To disseminate knowledge to young women of Vadodara city regarding organic food.

Delimitation of the study

1. The study was limited to the Vadodara city only.
2. The quality assessment of organic food and conventional (non-organic) food was done on selected bio-chemical, sensory parameters, cooking time and shelf life.
3. The quality assessment was limited to one item from each of the following food groups viz. Cereals, Pulses, Roots & tubers, Vegetables, Fruits and Jaggery.

Limitation of the study

The present research had the limitation of selecting organic food for quality assessment from the farms which were doing organic farming since past 4 to 8 years from the time of data collection (February 2008). Since converting land in to organic farming requires long time, samples were selected from the existing farm where organic farming was done. Environmental factors like rain, heavy wind etc. may bring the pesticides and fertilizer content from the nearby farms where pesticides were used.

Hypotheses of the study

1. There exists a variation in the extent of influence of various reasons, extent of utilization of organic food, extent of problem faced while using organic food and extent of satisfaction felt on using organic food with the personal, family, and situational variables of consumers.
2. There exists a relationship between extent of influence of reasons for buying organic food and extent of utilization of organic food, extent of problem faced while using organic food and extent of satisfaction felt on using organic food by the consumers.
3. There exists a relationship between extent of utilization of organic food and extent of problem faced while using organic food and extent of satisfaction felt on using organic food by the consumers.
4. There exists a relationship between extent of problem faced while using organic food and extent of satisfaction felt on using organic food.
5. There exists no difference in the extent of knowledge of respondents regarding organic food before and after the exposure to educational programme on organic food.