

**ASSESSING THE SCOPE OF STUDENT PARTICIPATION IN RAISING
A VEGETABLE GARDEN IN THE COLLEGE CAMPUS**

By

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I. INTRODUCTION

Half of the mankind is constantly threatened by hunger-Food and Agriculture Organisation (1966)¹. The ever increasing demands for food in the developing countries can never be satisfied permanently by the supply of free gifts of food by the developed countries. The emerging nations of the world therefore need to give more thought to improve the quality and quantity of food production in their own countries.

Leverton (1960)² brings out the influence of good nutrition on personality, effectiveness, emotional stability and health. Good Nutrition is obtainable only through adequate diets. A majority of the Indian population, however subsist on diets which are inadequate quantitatively and qualitatively because of their low incomes, Swaminathan and Bhagavan (1960)³. The imbalance between the supply and demand for food is serious in the country.

Patwardhan (1952)⁴ and Freeman (1966)⁵ point out that, one of the low cost sources which could enrich the Indian diet is vegetables. Vegetables and fruits are among the protective foods which are essential to regularise growth and development activities of the body. They contribute to the diet some minerals, vitamins and acids, Dhesi *et al* (1963)⁶, Singh (1965)⁷ and Randhawa (1966)⁸. The Nutrition Advisory Committee of the Indian Council of Medical Research (ICMR) (1966)⁹ prescribed the per capita daily requirement of vegetables as 284 gms. In contrast the actual intake is only 111 gms. As Subramanyan (1967)¹⁰ has pointed out, cereals and tubers cooked in some form or other,

constitute the main item of diet, while vegetables and fruits are only associated dishes.

The Second and Third Five Year Plans of India made several efforts towards increasing the production of fruits and vegetables. A number of comprehensive schemes have been drawn up for the Fourth Plan to give a fillip to vegetable and fruit production. The success of these proposals lies on the implementation of kitchen gardens by families, particularly the youth.

Swaminathan and Bhagavan (1960)³ advocate the production of vegetables as kitchen garden crops. Incentives to increase food production must be inculcated amongst the young, with simultaneous imparting of the necessary skills and knowledge. Citing Nehru, Dubey (1962)¹¹ states, that if an individual wishes to be a good producer, he should do his work with understanding. He advises the tempering of physical education with intellectual education. In his explanation of Basic education and the Sarvodaya ideal Gandhi (1951)¹² emphasized that education should be correlated with direct experiences of life, so as to maintain a balance between knowledge and practice. 'Learning by Doing' should be the core of all learning. This principle, according to Sykes (1950)¹³ will lead to a revolution in practice when properly carried out.

The Second Joint Indo-American Team on Agricultural Education (1960)¹⁴, suggested that since food production is recognized as the most outstanding problem of India, all agricultural education from primary

grades to the University level should be reorganised to maximise food production. Smith (1958)¹⁵, recommends newer methods of teaching based on field studies, to give students more participation and more responsibilities. Patel (1966)¹⁶ has pointed out that agricultural production activities should supplement the total educational programme to have real educational value.

Gandhi (1953)¹⁷ was of ^{his} view that agriculture should form an integral part of the curriculum in elementary education. The University of Madras has gone a step further by implementing it at the University level, by including it in the Home Science Course both in Home Management as well as in the Food Production and Agriculture Economics elective.

The purpose of selecting this study is to find out ways and means for making the study of Agriculture in Home Science more meaningful by placing proper emphasis on the practical aspects of raising a vegetable garden. Organising the students in an effective way to participate in the garden project could stimulate the students to use their extra time in a productive way. Through active participation they could be made to increase and retain their knowledge in a more realistic manner. Necessary skills could also be imparted to help them to produce vegetables. By planning, implementing and working together, the spirit of cooperation could be fostered.

II REVIEW OF LITERATURE

Literature pertaining to this study are reviewed under the following headings:

- A. Food position to-day.
- B. The importance of good nutrition and the role of vegetables in human diet.
- C. Need and scope for increasing vegetable production.
- D. Types of vegetable gardens.
- E. Factors to be considered while starting a vegetable garden.
- F. Possibilities of raising vegetables with the participation of youth.
- G. Studies on raising vegetable gardens.
- and H. Agencies which help raising of vegetable gardens.

A. Food Position To-day:

The increase in population in India has outstripped the increase in agricultural production, Subramanyan (1967)¹⁸. Endorsing this statement Swaminathan (1967)¹⁹ states that more than half the world's population is under-nourished or malnourished. He warns that less developed countries will have to increase their food production by atleast 50 per cent by 1975, if the population is to be fed a reasonably good diet. Subramanyan (1967)¹⁸ reports of a study conducted by the United States Department of Agriculture, which indicates that the overall increase in crop production in India during 1948-1968 was 3.1 per cent while the average growth in food demand went up to 3.4 per cent. The fluctuation in the crop production has been from a maximum of plus 9.7 per cent to

minus 1.9 per cent. The gap between the food supply and demand is widening.

Subramanyan et al (1962)²⁰ emphasize the recognition of different categories of food production in India, which are inadequate to meet the needs of the population. They further stress the need to plan effectively for increasing food production to keep up with the increasing population.

The increase in population of 8 million persons per year in itself will require 1 million tons of additional food grains each year. With an increase of the per capita intake of 100 calories per day, India would require an additional five million tons of food grains per year. We could probably import one million tons per year commercially. The balance of five million tons would need to be met somehow. A reserve is also needed to meet crop failures and other contingencies-The Times of India (1965-1966)²¹.

Date (1967)²² and Subramanyan et al (1962)²⁰ regard the food situation in India, as a continuously deteriorating one. The most important nutritional need in the country is that of bringing about a change in the food habits of the people, since the menu is heavily weighed in favour of cereals, as reported by the Government of India (1964)²³. The gulf between the recommended allowances and intake is given in Table I from the report of the ICMR.

TABLE I
ACTUAL AND RECOMMENDED FOOD INTAKE IN INDIA

Foodstuffs	Actual average intake in ounces	Recommended intake in ounces
1. Cereals	16.6	14.0
2. Pulses	2.3	3.00
3. Leafy vegetables	0.9	4.0
4. Other vegetables	4.1	6.0
5. Ghee and vegetable oil	0.9	2.00
6. Milk and milk products	3.53	10.00
7. Meat, fish and egg	0.9	4.00
8. Fruits and nuts	0.6	3.00
9. Sugar and Jaggery	0.7	2.00
10. Condiments and spices	0.4	..

The present intake is far below the recommended allowances for all food groups except cereals. Even to maintain this standard of food intake during the next 30 years, at least 150 per cent increase in the production of protective foods is called for. Simpson (1963)²⁴ has pointed out, that the diet of a majority of people is predominantly composed of 70 per cent Carbohydrates. Rural diets are composed largely of cereals, which should be supplemented by vegetables and other protective foods. This can be done by increasing the production of supplementary foods. To raise intake to optimum levels will mean increase in the production of protective foods still further. Two measures have been suggested by Subramanyan (1967)¹⁸ for increasing production-increasing the area under cultivation and increasing the yield per acre.

B. The Importance of Good Nutrition And The Role of Vegetables in Human Diet:

Devadas (1959)²⁵ defines health as complete physical, mental and social well being. Mahta (1963)²⁶ considers nutrition as the main factor which determines the level of efficiency of people. In order to nourish the body and sustain its functions, and maintain health and growth, balanced diet is essential-balanced in quantity and quality. Stevenson and Miller (1960)²⁷ stress the importance of having a variety of foods to plan diets which will furnish the required nutrients. Therefore steps should be taken to see that people obtain better diets in which fresh vegetables, milk, eggs and meat find a much larger place than now.

Under the changing pattern of economy people want not only to live but to live well-Krishnamurthy (1962)²⁸. In this context a cereal based diet is unsuitable for developing health and vigour. The change over from such a diet has been embodied in the Second and Third Plans.

Cooper et al (1945)²⁹, Taylor et al (1956)³⁰, Pollard (1956)³¹ and Shirur (1967)³² have stressed that vegetables form a major part of an individuals' diet as protective foods. They furnish in fair amounts vitamins A, B Complex and C along with Calcium and fibrous material. These elements are necessary for body building and in easy bowel movements. Siddappa (1962)³³ urges that provision must be made for the availability of fruits and vegetables for the years to come, in order to raise the nutritional standards of the people of India.

Srivastava et al (1962)³⁴ bring out the importance of vegetables in human diet. Besides supplying nutrients, they make food more appetizing

and enjoyable through the flavour and brilliant colour they possess, West and Wood (1955)³⁵,

C. Need And Scope for Increasing Vegetable Production:

The Indian Council of Agriculture Research - ICAR (1963)³⁶ stresses the need to augment food resources. Fruits and vegetables which are rich in some nutrients can supplement the main cereal or staple food of the country. Siddappa (1962)³³ points out that three ounces of fruits and ten ounces of vegetables are the minimum nutritional standard for a person per day. But the present consumption is only 50 per cent of the recommended allowances. Even this low consumption is not warranted by the production of fruits and vegetables in India according to Mehta (1963)²⁶. Therefore increasing production of fruits and vegetables must be given ^{the} highest priority. Devadas (1959)²⁵ recommends green and leafy vegetables as the cheapest and richest store house of vitamins for the poor man. Work and John (1955)³⁷ consider the garden as a feasible and profitable venture, almost anywhere, especially if people realize its value in health and good living. They also stress the educational value of gardening which provides training, knowledge and managerial skills. Edmond et al (1957)³⁸ regard gardens as excellently productive if they are properly cared for and managed.

The Delhi housewives started in 1960 the introduction of the habit of vegetable growing in their houses. The All India Women's Central Food Council Organised kitchen garden campaigns in Bombay, Chandigarh, Madras and Jaipur-FAO (1967)³⁹. The Hindu (1964)⁴⁰ reports a scheme to grow more vegetables, which operated in a area of about

30 miles ^{radius} in and around Tiruchi Town in which Rs.1,50,000 were distributed to about 500 ryots, by way of seeds, pesticides and fertilizers, by the Agricultural Department at subsidised rates with free technical advice. A special drive for raising kitchen gardens in bungalows in Tiruchi town was also launched in the same year, but the response was not encouraging, due to lack of water despite the institution of a prize for the best kitchen garden.

The FAO (1966)⁴¹ has appreciated the gaining popularity of kitchen gardens among the housewives who are getting interested in vegetable growing in their home gardens. Thapar (1960)⁴² points out that the kitchen gardens are fast becoming popular among the city dwellers. Lloyd (1935)⁴³ says that a home vegetable garden is maintained not for the purpose of income but for supplying the owner's table with fresh vegetables, which are the triumph of one's own labour.

D. Types Of Vegetable Gardens:

Gardens are of the following categories:

1. Private home gardens.
 2. Institutional gardens.
- and 3. Community gardens.

1. Private home gardens:

Premnath (1964)⁴⁴ refers to the increasing consciousness of people about utilising every inch of their soil. Even the residents of flats and small houses are trying to find out ways and means of cultivating plants on their verandhas and terraces. Space is not a limiting factor,

as Choudhary (1964)⁴⁵ states, since a well planned small garden can produce much more than an ill kept large garden.

Kereood (1963)⁴⁶ maintains that if every woman is made to understand the food values of fresh vegetables and fruits, she would try her best to produce a little in her own back yard wherever possible. Supporting this view, Manavathy (1963)⁴⁷ urges that every member of the Mahila Mandal should develop a kitchen garden. Cratch (1963)⁴⁸ indicates the three fold objectives of home gardens as follows:-

- Economic - to save on family budget for good food,
- Educational - to learn to consume a variety of food foods,
- and Extensional - to serve as a place for improved varieties and practices.

2. Institutional gardens:

The Applied Nutrition Programme through its school gardens has motivated parents to start vegetable gardens in their homes. Cratch (1963)⁴⁸ observes that, besides motivating the parents school gardens can also be used for teaching and moulding the personality of the students. He believes that in the higher classes the garden may be used for a variety of teaching activities such as measuring the area, laying out of plot, and simple account keeping. He considers the quantity produced as of minor importance.

Certain requisites for a successful school and home garden as listed by Cratch (1963)⁴⁸ are; ample space and facilities for the worker to enjoy the gardening work, proper tools, which are light with

long handles of good quality, good performance, good seeds, fertilizers and control measures, and a good understanding on the part of children on what they are doing. Production of fruits ⁱⁿ school gardens will add to the food produced for the feeding of school children. Mathews (1963)⁴⁹ urges that schools should raise orchards for growing fruits and vegetables required for school ^{feeding} feeding.

The Programme Evaluation Organisation of the Planning Commission (PEO) (1965)⁵⁰ reports that in Madras state 318 units of school gardens have been started against a target of 348 units. This programme was successful because it was linked up with the mid-day meal programme.

3. Community gardens:

De Valois (1955)⁵¹ observes that if there is lack of space or water facilities for individual homes, cooperative efforts should be made to start community vegetable gardens.

Cratch (1963)⁴⁸, lists the objectives of the community gardens as:

- a) To increase production of fruits and vegetables of a protective nature.
- b) To increase the revenue of the Panchayat to conduct social welfare work.
- c) To interest the village youth and women to participate and use the produce of the garden for free feeding programme.
- d) To serve as a demonstration place for improved practice.
- and e) To serve as a centre for production of vegetable seeds and

seedlings, saplings and grafts for the community.

Horticulture is among the production components of the Applied Nutrition Programme, which has introduced the community gardens. One hundred and thirty eight village gardens have been started in the 380 villages under Applied Nutrition Programme in Madras. The PEO (1965)⁵⁰ further states that an area of 5 acres of land is recommended for a village garden and the Panchayats are responsible to make the land available.

De Valois (1955)⁵¹ suggests that an attractive community garden could be raised by using large amounts of garbage and refuse of the Municipality as manure.

E. Factors To Be Considered While Starting Vegetable Gardens:

Though planning the kitchen garden is fairly simple, some basic points have to be borne in mind before one starts growing vegetables, according to Publication Division (1961)⁵² and Phatak and Seshadri (1965)⁵³. An appropriate size, correct location, a convenient and attractive layout and the right shape are the basic points that need attention as recommended by Dhesi et al (1963)⁶ and the Publication Division (1961)⁵².

1. Selection of plot:

Day (1935)⁵⁴ brings out the possibility of raising a kitchen garden, wherever there is sufficient ground. Fresh and clean home grown vegetables have an appeal and a value far surpassing that of the shop

articles. He discourage the establishment of kitchen gardens, out of sight.

The Publication Division (1961)⁵² and Dhesi et al (1963)⁶ state that a farm gardener has the opportunity to select the best and most suitably situated piece of land for growing vegetables. But in the cities, only the back yard is ^{the} most convenient location for the kitchen garden. It is convenient for the housewife to utilize her spare time in looking after it, because of its proximity. The source of water ^{should} also be close to the garden, and the latter should not be easily accessible to stray cattle.

2. Laying out the garden:

Dhesi et al (1963)⁶ consider, that an attractive lay out is one of the basic points, while planning a kitchen garden. Prannath (1964)⁴⁴ suggests, drawing a rough layout on a sheet of paper indicating the measurement of the area, for successful planning of the garden.

According to Choudhury (1964)⁴⁵ and the Publication Division (1961)⁵² the size of the kitchen garden depends on:

- a. The area available.
 - b. The time available for its care.
 - c. The number of members in the family.
- and d. Whether all or only a part of the vegetable supply is to be raised.

Choudhury (1964)⁴⁵ further states that the shape of the garden

is governed by the outline of the land available for use. Rectangular plots are preferred to square ones.

3. Selection of vegetables to be cultivated:

The Directorate of Advertising and Visual Publicity (1966)⁵⁵ reports that the choice of vegetables can be anybody's guess yet, the key to successful kitchen gardening is in the right choice of vegetables. It has been further stressed, that bhindi, tomato and brinjal are vegetables, which a keen kitchen gardener should never fail to grow, as they play an important role in the daily diet of the Indian people.

4. Preparation of the soil:

According to Beattie (1930)⁵⁶, with the location of the garden settled, the first step is the preparation of soil. Lloyd (1935)⁴³ says, that most vegetable crops can be successfully grown on different types of soil. But where there is ^{chance} change for a choice, it is advantageous to select a somewhat sandy soil for the production of early crops. Soils of a heavier type and more clayey nature are often preferred for later crops in localities where the mid-season rainfall is likely to be deficient. A clayey soil may be improved for gardening purposes by the incorporation of organic matter or humus. Heavy soils can be brought into workable condition earlier in the spring when they are thoroughly drained.

5. Manuring:

The soil requires thorough manuring, as kitchen gardening is a

form of intensive cultivation - Dhesi et al (1963)⁶ and Directorate of Advertising and Visual Publicity (1966)⁵⁵. An excellent method of doing this ^s reported by the Director of Agriculture (1963)⁵⁷, is by dividing the plots into narrow rectangular strips of convenient size. Each strip should be taken up at a time. The top soil of the first strip should be removed to a depth of about a foot and kept aside. The soil beneath the dug out strip should be broken up well and manured liberally; the top soil should be then replaced over the manure^d strip. If however, the top soil is not good, red earth^t may be spread out to improve the soil. Vegetable cultivation on such strips have been found to give good results.

Farmyard or compost may be supplied at the rate of 1 to 1½ pounds per square foot. The Directorate of Advertising and Visual Publicity (1966)⁵⁵ brings out the qualities of rotted cattle dung and compost as fertilizers. The Director of Agriculture (1963)⁵⁷, advises addition of 100 cart loads of farm yard manure or compost as a basal dose per acre, 45 kg. of calcium Ammonium Nitrate (CAN), 90 kg. of Superphosphate and 45 kg. of potash. The fertilizer should be covered by the soil immediately after each application, and copious and regular irrigation is advised for all crops, especially after the application of fertilizers. But the irrigation should not be excessive.

6. Watering:

MacGillivray (1953)⁵⁸ states, that in common with other succulent plants, vegetables are composed very largely of water. In addition to

that water is a solvent for transferring essential nutrients and foods to various parts of the plant. The soil holds water which can be used by plants. The amount of water that a soil can hold is a soil characteristic and varies with the soil. It has ^bben emphasized that the plants should be watered regularly, but this does not mean either mere sprinkling of water or flooding-the Directorate of Advertising and Visual Publicity (1966)⁵⁵. Irrigation should be as little as possible during rainy days and the excess water should ^bdrained off.

7. Weeding:

Dhesi et al (1963)⁶ consider weeds as those which rob the water, nutrients and even space from the plants. As weeds check the growth of delicate vegetable^s, the plot should be weeded after every irrigation or rain.

8. Use of pesticides and fungicides:

Vegetables like other crops, are attacked by insects which cause considerable damage such as rotting of seed in the soil, death of seedling, spoiling of leaves, stunted growth, yellowing of plants, dropping of leaves and poor quality of produce. Therefore plant protection and control measures against pests and diseases are important in vegetable cultivation. The common pesticides like 10 per cent BHC, DDT, Endrin and Malathion, and fungicides like copper oxychlorides or copper sulphate and quick lime should be kept in small quantities and used according to the direction given along with the chemicals.

F. Possibilities Of Raising Vegetables With The Participation Of Youth:

Mehta (1963)²⁶ reports that India has everything that nature can provide for increasing food production. As Hanumappa (1961)⁵⁹ states our greatest resources are the people, who form one seventh of ^{the} world population. What the country needs are the will to produce, technical guidance, and more manures and fertilizers. The quality of a civilization can be measured best by the degree with which the people work together. Group projects such as kitchen gardening and tree planting, which can secure economic benefits can be fostered through cooperative spirit.

In all these efforts youth who constitute a very delicate section of the society need very careful handling by all those who are concerned with the organisation of the activities for young people. Gupta (1965)⁶⁰ comments that education should make youth fit to meet life's challenges with confidence, new ideas and skills. Avinashilingam (1960)⁶¹ maintains that the vitality of children and their curiosity to know things for themselves are retained in ordinary schools by bookish education and the fear of punishment. Instead their energy and talents should be utilised for constructive purposes through activities like gardening. A new system of education which could be brought in line with the needs of life has been recommended by Gupta (1965)⁶⁰. In order to make India prosperous, youth should be given more importance with a new scale of values, ideals, scientific knowledge and practical skills. Galloway (1905)⁶² points out that Agriculture in its broadest sense is the primary basis of wealth in any country. Therefore efforts should

be made in the educational system to bring early to the mind of the child facts which will emphasize the importance and necessity of agricultural work. The author suggests that this could be achieved by a well managed and well conducted system of training for school garden.

Singh (1952)⁷ advises university students to utilise their spare time in the Grow More Food Campaign, on their campus itself while at study, and promote the campaign in rural areas during their holidays. How far these suggestions are feasible needs to be elicited through research studies in vegetable growing.

Deshmukh (1957)⁶³, informs that group work through cooperation is a world wide movement and every country has developed programmes of youth according to its own circumstances and requirements. Patel (1966)¹⁶, advises that the students may be divided into batches, each batch having 30 to 40 students, forming a homogenous group, and democratic spirit should be inculcated through healthy competitions, which will foster team work and appreciation for democratic values. The projects selected for such competitions should fit well into the community. They need to be practical and provide some income, savings, and satisfaction to the participants. Speaking of the 4-H club which is the most widely known and extensive rural youth organisation in the United States of America, Foster (1957)⁶⁴ states that, among the projects undertaken by the 4-H clubs are crop production and raising of community gardens. The Ministry of Agriculture (1958)⁶⁵, started the 4-D clubs as a part of the National Extension Services in Iran. One of the projects suggested in the 4-D club programme was raising vegetables and fruits.

Krishnappa (1952)⁶⁶ states that in Europe vegetables gardens are raised in boarding institutions by the residents themselves, whereby the young boys and girls are trained in their impressionable age for doing things themselves, and developing the ^{spirit} spirit of self help and dignity of labour. One of the most potential human resources in India is her rural youth. The Young Farmers' Association and its branches were formed to tap the unlimited energies of youth. The Community Development Blocks were made responsible for sponsoring Rural Youth Clubs, Young Farmers' Clubs, Yuvak Mandals and Hari Mandals. The main activities of these clubs are centred in food production.

G. Studies on Raising Vegetable Gardens:

Verma (1965)⁶⁷ studied the managerial aspects of a school garden which was maintained with pupils' participation in relation to the economy of the produce, children's interests and attitudes towards gardening and the time and other managerial aspects involved in cultivating a school garden. Her study revealed that during a period of six months, with an expenditure of 153.49 hours by the children, 26.31 hours by the gardener and 19.7 hours by the teachers or other guides, a total income of Rs.100.62 from the produce and a net profit of Rs.60.90 could be realised.

The implications of planning a school garden to supply the requirements of a school lunch programme for leafy and non-leafy vegetables and fruits were investigated by Sushila (1965)⁶⁸. She obtained a total produce worth Rs.340.21 from the planned garden during a period of ten months. Sithalakshmi (1966)⁶⁹ has proved the possibilities of utilising

profitably the waste water from a hostel kitchen for cultivation of vegetables in a school garden.

An experiment was conducted in 1963 in Trichy town, in raising vegetables in inter-spaces in banana gardens of selected villages. The results as reported by The Hindu (1964)⁴⁰ were satisfactory, since the earnings through the sale of the produce could effect a saving after meeting the cost of fertilizers and insecticides.

H. Agencies Which Help Raising Of Vegetable Gardens:

Chroboczek (1963)⁷⁰ states, that increasing the production of legumes, fruits and vegetables depends upon new techniques, for improving methods, better varieties, pest and disease control, marketing and transport facilities, provision of credit, setting up of cooperatives and technical advice. Some of the above requisites are being fulfilled by the assistance given by private agencies and government.

Parasai (1966)⁷¹ refers to the effectiveness of the 'Victory' garden idea, as a Grow More Food Campaign Project during World War II. According to De Valois (1955)⁵¹ the Grow More Food Campaign has also brought home the value of kitchen gardens to thousands who never dreamed of raising their own vegetables before.

During the Second Five Year Plan period a number of schemes were introduced by the ICAR (1966)⁷² for the development of fruit and vegetable production. As a result, output of fruit and vegetable production increased from about 20,000 tons at the end of the First Five Year Plan to about 100,000 tons by the end of the Third Five Year Plan.

Mathews (1963)⁴⁹ states that in Orissa Government lands were given wherever available to promote raising school orchards. The orchards had to be fenced by the local people with the assistance of government on a half grant and half loan basis. The United Nations Children's Fund (UNICEF) (1960)⁷³ has helped 17 countries with gardening tools and seeds for school and home gardens in order to stimulate self help activities for increasing food production. The UNICEF and FAO are assisting Applied Nutrition Programmes in India to increase production and consumption of protective foods. The State Governments provide practical help and guidance in raising vegetable gardens (1960)⁷⁴.

Garg (1943)⁷⁵ calls for ^{devising} devising ways and means to make the present drives bear lasting effect, since the need for more vegetables will be a permanent feature. He stresses that the masses must be educated about the need for eating more vegetables. Simultaneously experiments and research need to be organised for the improvement of vegetable culture.

III EXPERIMENTAL PROCEDURE

The experimental procedure for the study consists of:

- A. Selecting the sample of students for participation in the vegetable garden project.
- B. Preparing the selected sample for participation in the vegetable garden project.
- C. Selecting the area for raising the vegetable garden.
- D. Implementing the vegetable garden project.
- and E. Evaluation of the project.

A. Selecting The Sample Of Students For Participation In The Vegetable Garden Project:

The Third year B.Sc.Home Science class of Sri Avinashilingam Home Science College, Coimbatore, was selected to form the base for the sample since their course included raising a kitchen garden in the Home Management course. In addition, an elective course, Food Production and Agriculture Economics is available for those students who opt for that elective.

As a first step the investigator established rapport with the concerned students through informal meetings and introduced the idea of organising a vegetable garden project in the college. In order to elicit their attitudes, interests, knowledge and preferences in relation to the raising of the kitchen garden, she administered a questionnaire to the students which was prepared, pretested and finalised for that purpose as given in Appendix I.

Good and Seates (1954)⁷⁶ consider the questionnaire as a major

instrument for data gathering in descriptive survey studies and used to secure information from varied and widely scattered sources. The questionnaire method, defined by Pope and quoted by Gee (1950)⁷⁸ is a set of questions to be answered by the informant without the personal aid of an investigator or enumerator.

The data obtained in the questionnaire administered to the students was analysed under the following headings:

1. Personal details
2. Interest in gardening
3. Details of Home-gardens
- and 4. College vegetable garden project.

Based on the findings of the initial survey the vegetable garden project was organised.

1. Personal details:

The average age of the group was 19 years. Forty of the group were day students and thirty five were hostel students.

2. Interest in gardening:

Of the 80 students only five were not interested in gardening.

The interest evinced by the group was -

Vegetable garden	..	14
Flower garden	..	23
Both vegetable and flower garden	..	38

It is seen that the interest for flower garden was more (23 + 38) than that for the vegetable garden (14 + 38).

3. Details of Home gardens:

Thirty nine per cent of the students had both vegetable and flower gardens in their homes. Ten per cent had only vegetable gardens and six per cent had only flower gardens. Forty five per cent of the students did not have any garden at all.

A majority of the students having gardens (88%) were not aware of any assessment of the produce raised in their home-gardens. The garden produce was consumed at home or given to friends. It was not sold in the market since the quantity produced did not ^{warrant} warrant it.

The names of manures and fertilisers known to forty five per cent of the students having gardens were, farmyard manure, compost, groundnut cake, rose mixture and coconut mixture. Only thirty five per cent of those having gardens mentioned the insecticides used by them as copper sulphate, folidal, DDT, ash and lime water,

The vegetables raised in the home gardens were the traditional types like brinjal, bhendi, tomato, chillies, amaranth and dūastick. The garden jobs preferred by most of the students were watering, preparing the soil, sowing the seeds, harvesting and transplanting. The jobs least liked were applying insecticides, maintaining accounts and manuring.

The vegetables most frequently included in the menu as mentioned by over 45% of the students were - tomato, bhendi, beans, carrot, cabbage,

potato, greens, drumstick and brinjal. Other vegetables mentioned by less than 45% of the students were: beetroot, chillies, pumpkin, banana, cauliflower, ⁱ ^{cluster} ~~cluster~~ beans and radish.

4. College Vegetable garden project:

The importance of raising a vegetable garden as mentioned by the students is given in Table I below:-

TABLE I

IMPORTANCE OF VEGETABLE GARDEN AS MENTIONED BY THE STUDENTS

S.No.	Reasons	No. of students stating	percentage
1.	Supply of fresh clean vegetables	69	85.25
2.	Saves time, money and energy	63	78.75
3.	Interest and recreation to the family	64	80.00
4.	To increase the family income	18	22.5
5.	Satisfy family need for vegetables	15	18.75
6.	Helps in emergency	8	10
7.	Adds taste and variety	4	5

All the 80 students affirm that raising kitchen gardens is important since it economises on time and money, adds to family income and is a source of recreation.

Out of the ⁸⁰ eighty students, ⁷⁵ seven five were desirous of participating in the college vegetable garden project. The reasons for their desiring to do so were ^{as} listed in Table III given below:-

TABLE III
REASONS FOR WANTING TO PARTICIPATE IN THE VEGETABLE GARDEN PROJECT

S.No.	Reasons stated	No. of students stating	Percentage
1.	To add fresh vegetables to the hostel diet.	28	35
2.	Interest in gardening	27	33.75
3.	To gain knowledge about gardening.	20	25
4.	Good exercise and relaxation	16	20
5.	No garden at home	7	8.75
6.	It is a productive activity.	7	8.75
7.	To apply theory into practice.	5	6.25
8.	To use the waste water and the land available profitably.	4	5
9.	Interested to work in groups.	4	5

As seen in the Table III interest in gardening, adding fresh vegetables to the diet, gaining knowledge, exercise and relaxation are mentioned by over 20 ^{percent} of the students.

The reasons mentioned by those who did not want to participate in the project were:

1. Have to help with household duties in the evenings - 3
2. Own garden at home has to be attended to - 1
3. No interest in gardening - 1

The vegetables preferred by the students for being raised in the college vegetable garden project were tomato, bhāndi, brinjal, chillies, amaranth, corander, beans, drumstick and different types of gourds. The answers given to the question - "Do you feel that the vegetable garden project will help you?" are listed below:

TABLE IV

BENEFITS OF COLLEGE VEGETABLE GARDEN PROJECT AS VIEWED
BY STUDENTS

S.No.	Views about the garden project	No. of students stated	percent-age
1.	To gain knowledge about raising a vegetable garden.	25	31.25
2.	To supply fresh vegetables to the college hostel.	25	31.25
3.	Leisure time activity for the hostel students	17	21.75
4.	To raise income for social service activities	19	23.75
5.	To put the theoretical knowledge into practice.	11	13.75
6.	An incentive to start a home vegetable garden.	6	7.5

Table IV indicates the emphasis on the educational value of the project, its role in providing recreation and leisure time activities of a positive kind and the ability to contribute to constructive activities through selling the garden produce. The desire to understand and participate in good projects is there in the minds of students and when properly channelised it will yield equally good results.

Seventy five of the students were willing to spare time for the project. The details of the time preferred are given below in Table V.

TABLE V
TIME PREFERRED FOR EXECUTING GARDEN PROJECT WORK

S.No.	Time specified		Both		Number of students	Percentage
	Morning	Evening	AM	PM		
1.	7-7.30				1	
2.	8-8.30				4	
3.		4.30-5.00			30	
4.		5.00-5.30			23	
5.			7.00-7.30	4.30-5.00	13	

From the above table it is clear that 66.25 per cent of the students preferred to work in the evenings. Only 6.25 per cent of them were prepared to work in the morning and 16.25 per cent of them during morning and evening.

It is evident that most of them prefer evenings to work in the garden, as they would like to spend the morning hours for study, and relax by working in the garden in the evenings.

Thus, based on the interest of the students, 75 out of the 80 students in the class, were selected to participate in the vegetable garden project. The activities and work schedule timings were planned according to their preferences.

B. Preparing The Selected Sample For Participation In The Vegetable Garden Project:

This phase of the study consisted of:

1. Creating interest and providing information
- and 2. Organising the students for ^{the} vegetable garden project.

1. Creating interest and providing information:

Interest was created among project participants through meetings, lectures from specialists and demonstration. The project participants were taken to the inaugural meeting of the Home Kitchen Garden Project, initiated by the Department of Agriculture, Government of Madras at the Agricultural College, Coimbatore. A visit was also arranged to the Agriculture Farm, to see the model kitchen garden exhibit.

To maintain the sustained interest of the participants, a productivity drive was undertaken for all students in collaboration with the members of the College Planning Forum on the 2nd of October. Prizes were awarded to those students who put in maximum efforts. The evaluation was done by the concerned teaching staff to make it as objective as

possible.

Specialists in the agriculture field were invited to address the students on topics such as:

- a. Importance of raising a vegetable garden.
- b. How to raise a vegetable garden.
- and c. Control of pests and diseases.

A demonstration was conducted by the Agricultural Demonstrator from the Agriculture Extension Wing, Government of Madras, on how to raise a nursery bed. The details regarding the preparation of soil, manuring and watering were explained in detail and demonstrated.

2. Organising the students for the vegetable garden project:

When the students were motivated sufficiently, the project was organised with their help. The investigator met all the students to discuss and decide on the activities to be done and to outline the work schedule for the project.

The participants divided themselves into three major groups, each with a group leader. For convenience, each major group, was further divided into four sub groups consisting of a convenor and five other participants.

This grouping had to be changed for the sake of convenience of

- (a) those who were preparing to appear for the University Examinations in September,
- and (b) hostel and day students as the former wanted to work in the early morning and the latter in the evenings.

The group leaders were oriented to the records to be maintained regarding student participation as specified below:-

ATTENDANCE REGISTER

Months

S.No.	Names of the students	Date
-------	-----------------------	------



Total number of days: _____

Signature of the leader: _____

The group leaders were also introduced ^{to} the job chart and score card, shown below which would help to judge the activities performed by the students.

JOB CHART FOR A WEEK

S.No.	Name of the student	Day	Activities to be done	Time spent	Activities carried out
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In the job chart, the activities to be done were listed by the students, and time taken and the actual work carried out by each participant estimated by the investigator.

In order to judge the quality of work, the points considered were willingness to work, regularity and techniques used in working as shown below:

SCORE CARD FOR JUDGING THE QUALITY OF WORK

Name of the student	Quality of work	Total score
	1. <u>Willingness</u>	
	a. Very willing	3
	b. Willing	2
	c. Not so willing	1
	2. <u>Regularity</u>	
	a. Very regular	3
	b. Regular	2
	c. Irregular	1
	3. <u>Technique followed</u>	
	a. Good	3
	b. Fair	2
	c. Poor	1

C. Selecting The Area For Raising The Vegetable Garden:

The first step towards selecting the area, was mapping out by the project participants, the possible areas on the college campus where the garden could be raised. The individual plans were consolidated in a Master Plan. From this data, an area situated at the back of the hostel and near the kitchen was selected, since it facilitated the use of waste water from the hostel for purposes of irrigation. The area available for the vegetable garden project measured 143' x 58'.

D. Implementing The Vegetable Garden Project:

Implementing the vegetable garden project included preparing the soil, selection of vegetable crops, raising the nursery, care of the plants, collecting garden produce and maintaining records.

1. Preparing the soil:

The area selected was prepared for cultivation of vegetables with assistance from the college gardeners to till ^{the} hard ground in the initial stage.

2. Selection of vegetable crops:

The selection of vegetable crops was made, based on the preferences of the students who participated in the vegetable garden project. The vegetables preferred for cultivation, in the order of priority were brinjal, tomato, bhindi, carrot, chillies, french beans and amaranth. The reasons given by the students for selecting these vegetables were that they are quick yielding and commonly used in the daily diet. Anticipating the starting of the vegetable garden project, a few drumstick and papaya trees had been planted earlier, which started giving them yield^{ing} during the implementation period of the project and hence included in the study.

The vegetable seeds were procured from the local Agricultural Extension Office at subsidised rates.

3. Raising the nursery:

As instructed by the Agriculture Demonstrator, the nursery beds were prepared by enriching the soil with super phosphates and red soil. Each plot measured 7' x 8'. Tomato, brinjals, ^{and} chillies and carrot were raised in the nursery beds.

4. Care of the plants:

a) **Watering:** In the initial stages of plant growth, the young plants were watered with rose cans. Later the waste water from the college hostel and kitchen was channelised to irrigate the plants. Each plot was irrigated as and when necessary depending upon the moisture of the soil and the type of plants cultivated.

b) **Weeding:** Weeding was done once in three days using the garden fork.

c) **Using pesticides:** Folidol and D.D.T. were used as and when required.

5. Collecting of garden produce and maintaining records:

The produce from the garden project was collected, weighed and supplied to the hostel mess and the mid-day meals programme. Two types of garden registers were maintained:

a. Daily produce Register

and b. Monthly income and expenditure register.

Accounts were maintained for the money spent and the produce realised from the garden project, as given below:

PRODUCE RECORD

S.No.	Produce	Quantity	Market rate		Monetary value of the produce
			Rs.	Ps.	

EXPENDITURE RECORD

S.No.	Date of in- curring the expenditure	Voucher	Article	Quantity	Price		Total expenditure
					Rs.	Ps.	

E. Evaluation Of The Project:

The garden project was evaluated for:

1. Students' participation and ^{the} values derived by them,
- and 2. Economic benefits.

Two tests were administered to the students - one at the start of the project work and the other at the its conclusion, vide Appendix II and III. The two tests were valued by a lecturer in agriculture, who had no contact with the students participating in the vegetable garden project. This ensured objective assessment.

A questionnaire in Appendix IV was administered to the participants. It included questions to elicit information on the extent of students' participation, the reasons for participating or not participating, the activities undertaken, their interest in the activities, vegetables cultivated in the garden, benefits derived through participation in the vegetable garden project, difficulties faced and suggestions for improving the project.

The money spent, profit realised from the vegetable garden project, and evaluation of the project by the students were studied, analysed and the results presented in Chapter IV.

IV RESULTS AND DISCUSSIONS

The results of this study on assessing the scope of students participation in raising a vegetable garden in the college campus, are presented and discussed under the following heads:

- A. Assessing student participation in the vegetable garden project.
- and B. Outcomes of the project.

A. Assessing Student Participation In The Vegetable Garden Project:

The participation of students in the college vegetable garden project was assessed on the basis of:

1. The attendance of students during the implementation of the project.
2. Time spent by the participating students in the project.
- and 3. Marks and scores obtained by the participants for their performance in the vegetable garden project.

1. The attendance of students during the implementation of the project:

Forty day students and 35 hostel students had opted to work on the project. They worked for 40 and 47 days respectively, during the period of five months July to December 1967.

Table VI indicates the percentage attendanceⁿ of the student participants during the implementation period of the vegetable garden project.

TABLE VI
PERCENTAGE ATTENDANCE OF STUDENTS PARTICIPATING IN THE
VEGETABLE GARDEN PROJECT

S.No.	Percentage Attendance	Day students		Hostel students	
		Number	Percentage	Number	Percentage
1.	Upto 20	10	25	6	17.2
2.	21 - 40	21	52.5	17	48.6
3.	41 - 60	7	17.5	6	17.1
4.	61 - 80	2	5	5	14.3
5.	81 - 100	-	-	1	2.9

As seen from Table VI, the overall attendance was not encouraging, since 34 per cent of the hostel students and 23 per cent of the day students were present for more than 40 per cent of the days. The reasons for this appear to be the university examination in September, the monthly tests in November, the terminal holidays in the early half of September, other extra-curricular activities, and the terminal examination in December.

Table VII indicates the number and percentage of students who were present during each of the five months--Figure 1 Table VII.

TABLE VII
MONTH-WISE PARTICIPATION OF THE STUDENTS IN THE PROJECT

Month	Day students		Hostel students	
	Number of students present	Percentage	Number of students present	Percentage
July (from the 11th)	40	100	35	100
August	32	80	35	100
September	14	35	22	62.8
October	24	60	27	77
November	25	62.5	24	68.5
December (Upto the 11th)	40	100	13	37

It is seen that more hostel students were regular in their attendance than the day students from July to November. In December it was found that less attention was paid by the former to the project activities. Since the main reason for the irregular attendance appears to be tests and examinations, the capacity to take the tests and examination in their stride must be cultivated among the students.

How far this will be feasible with the present day emphasis on public examination, is to be explored. Internal assessment and due weightage to everyday practical assignments is likely to improve the position, and help to make education more meaningful, useful and practical.

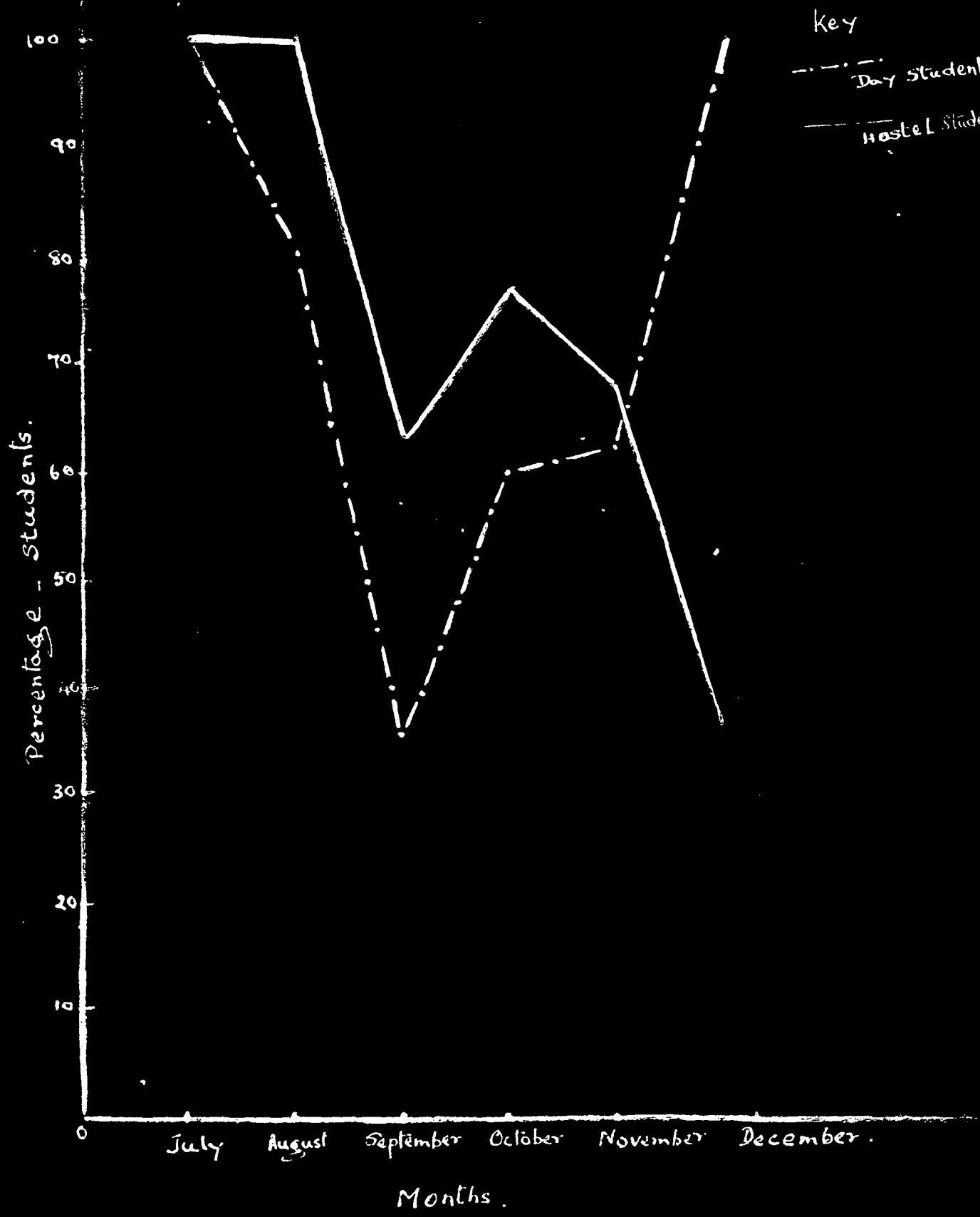


FIGURE 1.
MONTH-WISE PARTICIPATION OF THE STUDENTS
IN THE PROJECT.

2. Time spent by the participating students in the project:

The total number of man hours spent was arrived at by taking into consideration:

- a. Total number of participants working per day
- b. Total time spent per worker per day
- and c. Total number of working days.

The mean time spent per student per work day was worked out by dividing the total man hours by the total number of hands working over the period.

The mean time spent per work day, by the students, on the vegetable garden project activities and the total man hours spent are presented in Table VIII:

TABLE VIII
TIME SPENT BY THE STUDENTS PARTICIPATING IN THE VEGETABLE
GARDEN PROJECT

	Total number of work days.	Mean time spent per student per day				Total man hours spent
		Morning Min.Sec.	Evening Mts.Sec.	Total time Mts. Sec.		
Day students	40	-	21 49	21 49	190.2	
Hostal students	35	21 5	18 13	39 18	185.5	
Grand Total					375.7	

The total man hours spent by the whole group worked out to 375.7 hours over a period of five months from July 11th to December 11th. On an average, the hostel students were able to devote more time to the garden than the day students since the activities were held outside the regular class hours and they could work both in the mornings and in the evenings. The response on the part of the day students can be improved by allotting time during college curricular hours for the garden project.

3. Marks and scores obtained by the participating students for their performance in the vegetable garden project:

The performance of the participants was judged on the basis of:

- a. The marks obtained in the two tests, which would take into consideration the theoretical knowledge and the observation made by the students.
- and b. Scores awarded to the individual students for their willingness, regularity and techniques followed.

The marks awarded to the participants in the two tests are presented in Table IX and in Figure 2.

TABLE IX

MARKS OBTAINED BY THE STUDENTS IN THE TESTS CONDUCTED

S.No.	% marks	Percentage of students getting the marks			
		Day students		Hostel students	
		1st test	2nd test	1st test	2nd test
1.	Upto 20	-	7.5	8.6	2.8
2.	21 - 40	32.5	5	34.3	8.6
3.	41 - 60	67.5	32.5	57.1	31.4
4.	61 - 80	-	40	-	22.9
5.	81 -100	-	15	-	34.3

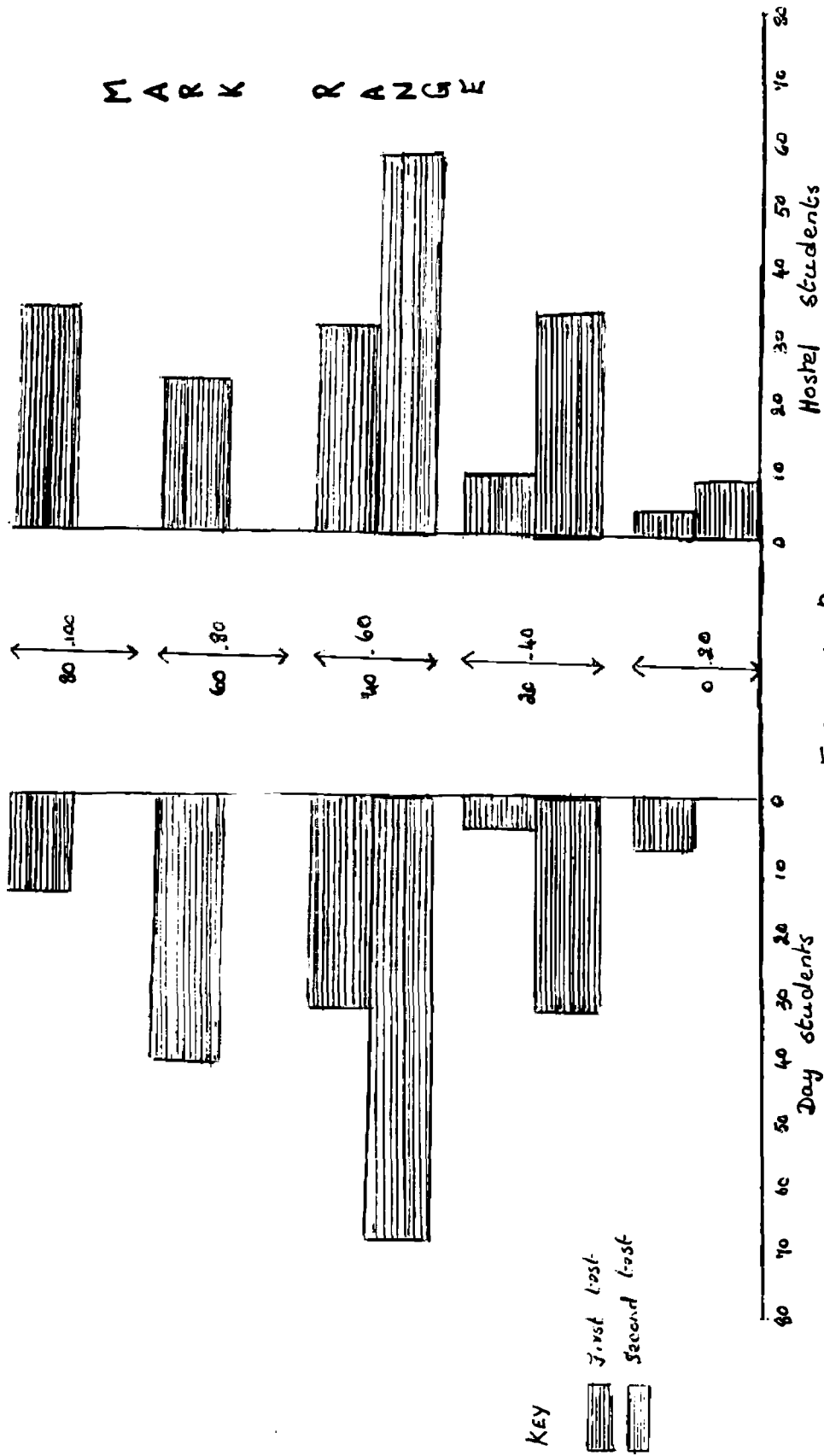


FIGURE 2

MARKS OBTAINED BY STUDENTS IN TWO TESTS.

Table IX and Figure 2 show that there was a marked improvement in the performance of the students as reflected by their marks in the second test. In the first test none of the students received above 60 per cent of marks, whereas in the second test more than 50 per cent had scored above 61 per cent. The vegetable garden project appears to have exerted some positive influence on the knowledge of the students. On statistical analysis vide Appendix V the performances of both the hostel and day students were found to be highly significant at one per cent level.

The statistical comparison of the performance of the day students and hostel students revealed that there was no significant difference in the marks awarded to them - vide Appendix VI.

Scores were given to the participants by the investigator based on three points namely - (a) Regularity (b) Willingness and (3) Techniques used.

Regularity was determined by the attendance. Marks were given for attendance as follows:

Upto 15 per cent	-	0
15 to 45 per cent	-	1
45 to 75 per cent	-	2
75 and above	-	3

Willingness was assessed by the investigator from the interest and initiative shown by the participants in the project.

The technique followed, was marked on the basis of the extent to which the instructions by the agriculture demonstrator, were carried out.

The details of the total scores obtained by the students are given below:

TABLE X
SCORES OBTAINED BY THE PARTICIPANTS IN THE VEGETABLE GARDEN PROJECT

Percentage of scores	Day students		Hostel students	
	Number	%	Number	%
Upto 20	8	20	-	-
21 - 40	11	27.5	14	40
41 - 60	12	30	10	28.6
61 - 80	8	20	9	25.7
81 -100	1	2.5	2	5.7

It is evident from Table X that the scores obtained by the hostel students were higher than those awarded to the day students. However when statistically analysed the difference between the scores obtained by day students and hostel students proved to be not significant.

B. Outcomes Of The Project:

The outcomes of the college vegetable garden project were assessed in terms of:

1. Economic returns
- and 2. Attitudes of the students.

1. Economic Returns:

The expenditures incurred on the vegetable garden project are given in Table II.

TABLE XI
EXPENDITURES INCURRED ON THE VEGETABLE GARDEN PROJECT

S.No.	Items of expenditure	Expenditure Rs. P.
1.	Seeds	4.40
2.	Folidol	5.15
3.	D.D.T.	5.75
4.	Farm yard manure	8.00
5.	Super phosphate	2.00
6.	Red earth	5.00
7.	Labour engaged	7.00
	Total	37.30
8.	Labour supplied by student participants	94.00*
	Total expenditure	131.30

* Computed using the formula $\frac{\text{Total man hours}}{\text{eight hour day}} \times \text{Rs.2/-}$ (which is the prevailing local rate per day per woman worker)

$$\frac{375.7 \text{ man hours}}{8} \times 2$$

The quantity produced and monetary value of the garden produce assessed on the basis of the prevailing market prices for the different crops at the time of harvesting are given in Table XII below:

TABLE XII
QUANTITY AND MONETARY VALUE OF THE GARDEN PRODUCE

S.No.	Type of vegetable	Quantity produced	monetary value
1.	Drumstick	4,384 in number	165.86
2.	'Bhindi'	52.75 kg.	21.10
3.	Tomato	212.25 kg.	105.56
4.	'Amaranth'	294.00 kg.	28.80
5.	Brinjal	35.00 kg.	9.99
6.	Drumstick 'Keerai'	50.00 kg.	5.00
7.	Ridged gourd	73 Numbers	7.30
8.	Ash gourd	9 Numbers	7.90
9.	Field beans	4.75 kg.	2.10
10.	Chillies	1.25 kg.	0.75
11.	Radish	3.00 kg.	0.90
12.	Pappaya	203 Numbers	50.75
	Total money income		406.01
13.	Monetary value of labour supplied by students		94.00
	Total Income		500.01

Tables XI and XII give the expenditure on, and income from the vegetable garden project. The total expenditure incurred worked upto Rs.131.30 Ps. including the Rs.94/- supplied as labour by the student participants. The total money income was Rs.406.01. With the addition of the Rs.94/- the total income was Rs.500.01. Therefore the profit realised in terms of money amounted to Rs.368.71 and in terms of real income Rs.94/-

2. Students' attitudes

The students attitudes towards the vegetable garden project was assessed with the help of a final evaluation sheet given in Appendix IV.

The answers revealed the nature of participation of students in the project, their interest in the various activities, benefits derived from the project, difficulties faced and their suggestions for improving the project.

Out of the 75 participants in the vegetable garden project, 18.7 per cent stated that they participated throughout the period, and 81.3 per cent stated that they participated inter mittently. The reasons for participating throughout the period or intermittently are given in Table XIII.

TABLE XIII
REASONS FOR PARTICIPATING IN THE VEGETABLE GARDEN
PROJECT ACTIVITIES

S.No.	Manner of participation	Number mentioning	Reasons given	Percentage of students mentioning
1.	Throughout the period	14	a. Interested in gardening	64
			b. Sense of responsibility	21
			c. Time was available in the evenings	15
2.	Intermittently	61	a. Lack of time due to other extra curricular activities.	99
			b. September examinations.	30
			c. Getting back home	5
			d. Week-end outings	2
			e. Illness	3
			f. Decreasing interest	2

Interest in gardening and a sense of responsibility were the reasons mentioned by the students for participating in the project throughout the period. This indicates that with proper motivation optimum mobilisation of students in productive activities could be achieved.

Lack of time, was the main reason for the day students 'intermittent' participation. Perhaps this problem could be solved by including gardening activities in the regular college working hours, and giving proper weightage for practicals in vegetable gardening in the university examination to make it more meaningful. The assessment can be done internally over the course of three years and a certificate for participation can be awarded which would go into the practical record as is being done in the case of First Aid and Home Nursing in the Home Management course.

The various activities in the vegetable garden project in which the participants took part with interest are listed in Table XIV and Figures 3 and 4.

TABLE XIV
ACTIVITIES IN WHICH THE PARTICIPANTS EVINced INTEREST

S.No.	Activities	Students participating		Interest of the students			
		Number	Percent- age	Interes- ting.	Percent- age	Not	
						interes- ting	Percent- age
				Number		Number	
1.	Watering	70	93.3	61	81.3	9	12.0
2.	Preparing the plots	62	82.7	55	73.3	7	9.3
3.	Sowing the seeds	53	70.7	52	69.3	1	1.3
4.	Weeding	48	57.3	40	53.3	8	10.7
5.	Planning	32	42.7	31	41.3	1	1.3
6.	Laying out	30	40.0	26	34.7	4	5.3
7.	Harvesting	28	37.3	18	24.0	10	13.3
8.	Weighing the produce	27	36.0	23	30.7	4	5.3
9.	Applying manure	22	29.3	20	26.7	2	2.7
10.	Applying pesti- cides	10	13.3	6	8.0	4	5.3
11.	Account keeping	6	8.0	4	5.3	2	2.7

The more popular activities were watering, preparing the plots and sowing the seeds. The least popular were account keeping and applying pesticides and manures.

Table XV reveals the benefits derived from the vegetable garden project as stated by the participants.



FIGURE 3

STUDENTS IN ACTION IN THE VEGETABLE
GARDEN PROJECT



FIGURE 4
STUDENTS IN ACTION IN THE VEGETABLE
GARDEN PROJECT

TABLE XV
BENEFITS DERIVED FROM THE VEGETABLE GARDEN PROJECT

S.No.	Benefits derived	Participants stating	
		Number	Percentage
1.	Knowledge regarding raising vegetable garden	65	85.3
2.	Satisfaction due to participation in a productive activity	65	85.3
3.	Improved health	8	10.7
4.	Development of interest in raising the vegetable garden	6	8
5.	Spirit of cooperation	3	4
6.	Supply of fresh and clean vegetables	2	2.7

The participants in the vegetable garden project had emphasised the educational value in raising the vegetable garden as well as the satisfaction from their participation in a productive activity, as two important benefits derived from the project.

The difficulties faced by the participants during the course of their participation in the vegetable garden project are listed below:

TABLE XVI
DIFFICULTIES FACED BY THE PARTICIPANTS DURING THE
PROJECT PERIOD

S.No.	Difficulties	Students mentioning	
		Number	Percentage
1.	Clayey nature of the soil	23	30.6
2.	Lack of skill in handling the implements	23	30.6
3.	Lack of time due to examination and tests and other extra curricular activities	19	25.3
4.	Lack of water for irrigation purposes	6	8.0
5.	Lack of cooperation from the friends	4	5.3

The difficulties faced by the participants during the project period could be classified as:

- a. those arising from the soil, water and lack of skill in handling the implements.
 - b. Limitation of time due to examinations and tests.
- and c. lack of cooperation in some groups.

The clayey nature of the soil made weeding rather difficult especially after the rains. Since the bath room waste water was used for irrigation purposes, the already brackish water became ^{soapy} and formed a scum which was deposited on the vegetable beds. This and scarcity of water from the month of October resulted in the stunted growth of the plants and were limiting factors in this study. Since the study was confined to a period of five months, giving proper training to parti-

participants in the handling of all the implements available was not possible. This was a real difficulty experienced by 30 per cent of the participants.

The suggestions made by the project participants are:-

1. Allotment of more time during class hours for gardening activities.
2. Need to improve the clayey soil and the water facilities.
3. Inclusion of vegetable gardening as a compulsory project in the curriculum.
4. Formation of smaller groups and allocating individual plots and prizes for each group.
5. Guidance in the handling of implements.
- and 6. Using modern implements in the garden project.

The suggestions given by the students reveal that more motivation, technical guidance and team spirit were required.

V. SUMMARY AND CONCLUSION

Seventy-five students of the III B.Sc.Home Science class, participated in the vegetable garden project organized on the campus of Sri Avinashilingam Home Science College, Coimbatore. Forty day students and 35 hostel students worked on the project for 40 and 47 days respectively over a period of five months, contributing 375.7 man hours of labour equivalent to Rs.94.00 in wages. The study revealed the following:

1. The attendance of the students was neither full nor uniform over the project period due to public examinations, monthly tests, terminal holidays and other extra-curricular activities in the college.
2. The hostel students were able to devote more time to the project work than the day students, since the activities were held outside the class hours and since they could work both in the mornings and evenings.
3. The performances of the participants in the two tests, indicated that the project had a positive influence on the knowledge gained by the students.
4. A net profit of Rs.368.71 was realised through the garden project, during the five months of its operation.
5. Watering, preparing plots, sowing seeds and weeding were the most popular activities in the garden for the students, while applying pesticides and account-keeping were least popular.

6. The important benefits accruing from the vegetable garden project as evaluated by the participants are its educational value and the sense of satisfaction imparted by the participation in a productive activity.
7. The difficulties faced were mainly concentrated on the clayey nature of the soil, limitation of water, lack of skill in handling the implements and lack of time.
8. The suggestions made by the participants for more successful efforts in the future included allotting class hours for vegetable garden project activities, formation of smaller groups and allotting individual plots offering more guidance in the handling of implements and the improvement of the texture of the soil.

Thus this study has emphasized the need to include vegetable gardening as practicals in the curriculum of the Home Science courses, and allot hours in the college time table for the garden activities; and the need for motivating students through cooperation and competitions. The findings are bound to be of interest to those who are for organising projects for raising vegetable gardens in colleges through Planning Forums, in elementary schools for the mid-day meals programme and in Community Development Blocks through the aegis of the Farm Youth Clubs and Mahila Mandals.

BIBLIOGRAPHY

BIBLIOGRAPHY

1. Food and Agricultural Organisation, "Youthful Ideal is a Secret Weapon in War on Hunger", Freedom From Hunger. September-October 1966. VII. No.44. p.30.
2. Leverton, R.M. Food Becomes You. Ames Iowa. Iowa State University Press, 1960. P.15.
3. Swaminathan, M., Bhagavan, R.K. Our Food. Mysore: The Wesley Press, 1960. p.1
4. Patwardhan, V.N. Nutrition in India. Bombay: The Indian Journal of Medical Sciences, 1952. p.6.
5. Freeman, L. "Food Aid", Agricultural Situation Statistical Reporting Service. U.S.Department of Agriculture: Feb.1966 L.No.2. p.3.
6. Dhesi, N.S., Padda, D.S., and Sandhu, A.S. "Grow Your Own Vegetables in National Emergency", The Punjab Horticulture Journal. January-March. 1963, III No.1. pp.12-18.
7. Sing, D. "Crash programme For More Fruits and Vegetables ", Indian Farming. No. Delhi: Indian Council of Agricultural Research, October, 1965, pp 29-31.
8. Randhawa, M.S. "What Nutrition Vegetables contain", Indian Horticulture - Vegetables special supplement. New Delhi: Indian Council of Agriculture Research. Jan-Mar, 1966, X. No.2. p.5.
9. Indian Council of Medical Research, The Nutritive Value of Indian Foods and the Planning of satisfactory diets. New Delhi: 1966. pp.28-32.
10. Subramaniyan, V. "Significance and Importance of non-cereal Foods", Farm and Parliament. Farmers Parliamentary Forum. January, 1967. p.13.
11. Dubey, M.C. Basic Education and New Social Order. New Delhi: National Institute of Basic Education. National Council of Educational Research and Training, 1962. p.42.
12. Gandhi, M.K. Basic Education. Ahmedabad: Navjivan Publishing House, 1951. p.112.
13. Sykes, M. Basic Education - Its Principles and Practice. Madras: Department of Public Instruction, 1950. p.3
14. Indian Council of Agricultural Research, Report of the Second Joint Indo-American Team on Agricultural Education, Research and Extension, New Delhi: 1960. p.9

15. Smith, L. The Rural Institute of Higher Education. New Delhi: Ministry of Education, Government of India, 1958. p.9
16. Patel, A.U. "Food Democracy and the School", Delhi: Directorate of Publication Division, Kurukshetra. January, 1966. XIV. No.4 p.20.
17. Gandhi, M.K. Towards New Education. Ahmedabad: Navjivan Publishing House, 1953. pp.29,43.
18. Subramanyan, V. "New Cereal Foods Can Enrich Our Diet," Indian Farming. No., Delhi: Indian Council of Agricultural Research, XVI. No.11 ~~pp~~ 1967, p.15.
19. Swaminathan, M., "Nutrition and the World Food Problems", Borden's Review on Nutrition Research, XIVIII. No.1 Jan-March.1967. New York: pp.29.
20. Subramanyan, V., Srinivasan, A., and Swaminathan, M. Symposium on Food Needs and Resources. New Delhi: National Institute of Science of India, 1962. pp.1,4,5,6.
21. The Times of India, Directory and Year Book 1965-66. Delhi: A Times of India Publication. Bennet Coleman and Co. Ltd., The Times of India Office. p.249.
22. Date, W.B. "Food Shortage and Food Habits", Kurukshetra. Delhi: Director of Publication Division, May.1967. IV. No.8 p.12.
23. Government of India, Ministry of Community Development and Cooperation. Applied Nutrition Programme in India. Report by the Government of India, United Nation's Children's Fund, Jan.1964. p.1
24. Simpson, I.A. "The Production Aspects of Nutrition and the prevention of malnutrition", All-India Orientation Training Seminar on Applied Nutrition. (17th-23rd Oct) 1963. New Delhi; Ministry of Community Development and Cooperation, Government of India. 1963. p.180.
25. Devadas, R.P. Text Book of Home Science. New Delhi: Indian Council of Agricultural Research, 1959. pp.108.
26. Mehta, T.R. "Nutrition Aspect of Agricultural Production," All India Orientation Training Seminar on Applied Nutrition (17th--23rd Oct) 1963. New Delhi: Ministry of Community Development and Cooperation. Government of India, 1963. pp.36-38.

27. Stevenson, G.T., Miller, C. Introduction to Food and Nutrition. New York: John Wiley and Sons, Inc., 1960. p.4.
28. Krishnamurthy, S. "Fruits-^{needs} and Resources," Symposium on Food and Resources. New Delhi: National Institute of Sciences of India, 1962. p.68.
29. Cooper, L.F., Barber, E.M., and Mitchell, H.S. Nutrition in Health and disease. Philadelphia: J.B.Lippincott Co., 1947. p.512.
30. Taylor, C.M., Macleod, G., and Ross, M.S. Foundations of Nutrition. New York: The MacMillan Co., 1956. p.413.
31. Pollard, L.B. Experiences With Foods. Boston: Ginn and Company, 1956. p.239.
32. Shirur, R.J. "Why Vegetables," Nutrition. Hyderabad: Nutrition Research Laboratories, Indian Council of Medical Research, Jan 1967. p.7.
33. Siddappa, G.S. "Processing of Fruits and Vegetables," Symposium on Food Needs and Resources. New Delhi: National Institute of Sciences of India, 1962. pp.145-146.
34. Srivastava, A.C., Kapur, N.S., Dalal, V.B. "Preservation of fresh fruit and vegetables", Symposium on Food Needs and Resources. New Delhi: National Institute of Science of India, 1962. p.152.
35. West, B.B., and Wood, L. Food Service in Institutions. New York: John Wiley and Sons, Inc., 1955. III. pp.147, 149.
36. Indian Council of Agricultural Research, Indian Horticulture. New Delhi: Jan-March 1963. VII. No.2 pp.2-7.
37. Work, P., and Jehn, C. Vegetable Production and Marketing. New York: John Wiley and Sons. Inc., 1955. p.22.
38. Edmond, J.B., Musser, R.M., and Andrews, F.S. Fundamental of Horticulture. New York: McGraw Hill Book Company, Inc., 1957. p.435.
39. Food and Agriculture Organisation. "Delhi Wives Head Home Garden Drive," Freedom From Hunger. Jan-Feb.1967. VIII No.46. p.31.
40. The Hindu. "Cultivation of Vegetables", 9th July, 1964.
41. "Women: Vital Force in Building the New Nations", Freedom from Hunger. Food and Agriculture Organisation, March-April, 1966. XII. No.41. pp.7,8,31.

42. Thapar, A.R. Horticulture in the Hill region of North India. New Delhi; Directorate of Extension, Ministry of Food and Agriculture, 1960. p.171.
43. Lloyd, J.W., Productive Vegetable growing. Philadelphia: J.B.Lippincott Co., 1935. pp.6,8.
44. Premnath, "Terrace Gardening", Delhi Garden Magazine. Delhi: Delhi Horticultural Society, I.C.A.R., April-June, 1964. III. No.2. 1964. pp.14-20.
45. Choudhury, B. "Home Vegetable Garden", Delhi Garden Magazine Delhi: Delhi Agri-Horticulture Society, I.C.A.R., July-Sept.1964. III No.2 pp.14-20
46. Kercood, V. "Role of Mahila Mandals in the Expanded Nutrition Programme," All India Orientation Training Seminar on Applied Nutrition (17-23 Oct) 1963. New Delhi: Ministry of Community Development and Cooperation, Government of India, 1963. pp.77-79.
47. Manavathy, M.C. "Role of Panchayats and Associate Organisations of Yuvak Mandals and Mahila Mandals in promoting the Applied Nutrition Programme", All India Orientation Training Seminar on Applied Nutrition (17th-23rd Oct) 1963. New Delhi: Ministry of Community Development and Cooperation, Government of India, 1963. p.79.
48. Gratch, H. "Applied Nutrition Programme-Horticulture. Principle and Philosophy", All India Orientation Training Seminar on Applied Nutrition (17th-23rd Oct) 1963. New Delhi: Ministry of Community Development and Cooperation, Government of India, 1963. pp.119, 120.
49. Mathews, V.S. The Applied Nutrition Programme in Orissa. Cuttack: Orissa Government Press. 1963. p.6.
50. Programme Evaluation & Organisation. Planning Commission. Government of India, Report on Current Evaluation of the Applied Nutrition Programme (1964-65). May, 1965. p.27.
51. De valois, S.S. Vegetables in India. 3rd Ed. Madras Christian Literature Society, 1955. p.25.
52. The Publication Division, Kitchen gardening. Faridabad: Government of India Press. 1961. p.3.
53. Phatak, S.C., and Seshadri, V.S. "Some tips for successful vegetable Growing," Delhi Garden Magazine. Delhi: Delhi Agri-Horticultural Society, ICAR, JULY-Sept.1965. IV.No.3p.9

54. Day, H.A. Your kitchen Garden. London: Methuen and Co. Ltd., 1935.
55. Directorate of Advertising and Visual Publicity, Ministry of Information and Broadcasting, Government of India, Vegetables All the Years round. Calcutta: Kali and Co., Pvt.Ltd., 1966.
56. Beattie, W.R. The City Home Garden. U.S.Department of Agriculture, Farmer's Bulletin. No.1044, 1930. p.1
57. Director of Agriculture, Madras, "Kitchen Gardening", Madras Health Education. Oct-Nov.Dec. 1963. II.No.3 pp.1-7.
58. MacGillivry, J.H. "Irrigation of Vegetables," Vegetable Production. New York: The Blabiston Co. Inc., 1953. p.84.
59. Hanumappa, P. Hand book on Rural Youth Programmes in India. New Delhi: Directorate of Extension, Ministry of Food and Agriculture Department of Agriculture. Government of India. 1961. pp.1-5.
60. Gupta, G.B. Guide to Rural Youth Orga ization based on a pilot Project. Planning Department. U.P.Lucknow: Aug.1965.
61. Avinashilingam, T.S. Gandhiji's Experiments in Education. Ministry of Education, Government of India, 1960. pp.20,26,61, and 74.
62. Galloway, B.T. School Gardens. U.S.Agricultural Department Bulletin, 1960. Washington: Government Printing Office, 1905. p.11.
63. Deshmukh, P.S. Miracles of Cooperation. Punjab: Chamanbal Dharmsala CantM, 1957. pp.1.
64. Foster, G.S. All Club Local Leader ^Hand book. University of Tennessee: Agricultural Extension Service, Publication 316, 1957. p.48.
65. Ministry of Agriculture, National Extension Service. A Manual for @ 4D Club work in Bran. 1958. 9.
66. Krishnappa, L.P. Food and Population and Development of Food Industries in India. C.F.T.R., Mysore: The Wesley Press and Publishing House, 1952. pp.144-156.
67. Verma, K. Some Managerial Aspects of School Garden with ^Special Reference to Pupils' participation. The University of Madras: in partial fulfilment of the Degree of Master of Science, 1965.

68. Sushila, A. Effects on School lunch with leafy or non-leafy vegetables on nutritional status and Development of pupils. A thesis submitted to the University of Madras in partial fulfilment of the Degree of Master of Science.
69. Sithalakshmi, S. Managerial aspects in the utilization of waste water from a Hostel kitchen for producing vegetables. Thesis submitted to the University of Madras in partial fulfilment of Degree of Master of Science, 1966.
70. Carboesse, E. World Food Congress. Rome: Food and Agriculture Organisation, June.1963. p.44.
71. Parasai, P.S. "Kitchen garden", Agriculture situation. Dec.1966. L.No.12. p.38.
72. Indian Council of Agriculture Research, "Marketing Horticultural commodities", Indian Horticulture. New Delhi: April-June 1966. X. No.3 p.2.
73. UNICEF. UNICEF Compendium. 1960. XII. p.50.
74. International Organisation and Indian Health Programmes. UNICEF in India, May, 1960. p.8.
75. Garg, M.L. "Vegetables in India", The Indian Journal of Horticulture. The Horticultural Society of India, June.1943. pp.18-19.
76. Good, C.V. and Seates, D.E., Methods of Research. New York: Appleton Century crepts, 1954.p.637.
77. Gee, W. Social Science Research Method. New York: McGraw Hill Book Company, 1966, pp.220, 539-540.

APPENDICES

APPENDIX I

SRI AVINASHILINGAM HOME SCIENCE COLLEGE
GOIMBATORE. 11

Questionnaire to find out the attitude of the students towards raising a vegetable garden.

Sl.No.

Date:

1. Personal details:

1. Name:

2. Class:

3. Age:

4. Whether staying in the hostel

or

at home

5. Address if staying at home:

2. Interest in Gardening:

Are you interested in gardening?

a. Vegetable yes No

or

b. Flower yes no3. Details of Home gardens

a. Do you have a garden at home?

Vegetable: yes No Flower: yes No Both yes No

b. Do you assess the amount of produce from your garden?

c. What do you do with the produce?

- d. What manure or fertilizer do you use?
- e. What pesticides do you use?
- f. Mention the plants you raise in your garden.
 - 1.
 - 2.
 - 3.
 - 4.
 - 5.
 - 6.
 - 7.
 - 8.
 - 9.
 - 10.
- g. Mention the activities you are interested in while raising garden.
 1. Preparing the soil,
 2. Manuring,
 3. Sowing the seeds and preparing the nursery,
 4. Transplanting,
 5. Watering,
 6. Weeding,
 7. Harvesting,
 8. Applying pesticides and fungicides,
 9. Maintaining the account.

h. Give a list of vegetables which are commonly used in your daily menu:

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.
- 8.
- 9.

4. College Vegetable Garden Project:

a. Do you feel that raising and maintaining a vegetable garden is essential for a house-wife?

yes

No

Reasons

b. Would you like to participate in the vegetable garden project in our College?

yes

No

Reasons:

- e. List the vegetables you would like to grow in the college vegetable garden.

Name of vegetable	Reasons for choosing them

- d. Do you feel that the vegetable garden project will help you in any way?

yes

No

- e. What are your reasons?

- f. i. Could you spare some time on the project work?

yes

No

ii. How much time per day could you spare for gardening?

Indicate your preference by placing a tick (✓) mark in the appropriate place.

Morning			Evening	
7.00--7.30	7.30--8.00	8.00--8.30	4.30--5.00	5.00--5.30

Signature of student

APPENDIX XI

SRI AVINASHILINGAM HOME SCIENCE COLLEGE
COIMBATORE. 11

Vegetable Garden Project

Test No. 1

1. Why are vegetables important in human nutrition?

2. a) If you are asked to start a college kitchen garden on a small piece of land 50' x 50', what are the vegetables you would like to grow on it?

Give reasons for your choice.
- b) Draw the layout of the garden so as to utilise the space to the optimum extent possible.

3. What plants do you think could be raised in
 - a) Summer
 - b) Winter

4. Name the vegetable crops which you know will give quick yield.

5. Mention the common pests and the pesticides used in vegetable gardens.

APPENDIX III

SRI AVINASHILINGAM HOME SCIENCE COLLEGE
COIMBATORE. 11

Vegetable Garden Project

Test No.2

1. What are the manures and fertilizers used in the vegetable garden?
2. Mention the pesticides used in the vegetable garden.
3. What are the vegetable crops for which
 - a. nursery beds are necessary
 - and b. for which nursery beds were raised in our project.
4. Which was the most quick yielding crop?
5. Mention the crops cultivated in the vegetable garden project.
6. Which are the best vegetable crops suited for the soil on the campus?

APPENDIX IV

SRI AVINASHILINGAM HOME SCIENCE COLLEGE
COIMBATORE.11

FINAL EVALUATION SHEET FOR THE VEGETABLE GARDENING PROJECT

1. Participation in vegetable garden project:

Throughout the period	Intermittently	Never	Reasons
-----------------------	----------------	-------	---------

2. The activities in which you participated and derived satisfaction:

Activities	Yes No	Interes- ting	very interes- ting	Not inte- resting	Reason
------------	-----------	------------------	--------------------------	-------------------------	--------

- a. Planning
- b. Laying out the garden
- c. Preparing the plot
- d. Applying manure
- e. Sowing the seeds
- f. Watering the plants
- g. Fencing

Activities	Yes/No	Interes- ting.	Very inte- resting	Not interesting	Reasons
h. Weeding					
i. Applying pesticides					
j. Harvesting					
k. Weighing the produce					
l. Account keeping					

3. What are the benefits you gained through participation in the vegetable garden project?
4. What were the difficulties you faced in implementing the vegetable garden project?
5. What are your suggestions for improving the vegetable garden project?
6. Any other remarks regarding the vegetable garden project.

Signature of the participant

APPENDIX V

THE 't' TEST WAS ADMINISTERED TO COMPARE THE PERFORMANCE OF DAY STUDENTS AS WELL AS HOSTEL STUDENTS IN THE TWO TESTS.

* Formula

$$t = \frac{|\bar{X}_1 - \bar{X}_2|}{\sqrt{\frac{S_1^2}{n_1} + \frac{S_2^2}{n_2}}}$$

\bar{X}_1 = Mean of the marks in the first sample

\bar{X}_2 = Mean of the marks in the second sample

S_1^2 = Variance of the first sample

$$= \frac{\sum x_1^2}{n_1}$$

S_2^2 = Variance of the second sample

$$= \frac{\sum x_2^2}{n_2}$$

n_1 = Number of students in the first sample

n_2 = Number of students in the second sample

* The same formula is applied for the tests given in Appendices VI and VII.

- a. Comparison of the performance in the two tests for the day students.

$$\bar{X}_1 = \frac{1770}{40} = 44.25$$

$$s_1^2 = \frac{80796}{40} = (44.25)^2 = 2019.0 - 1958.0625 = 61.8375$$

$$\bar{X}_2 = \frac{24701}{40} = 61.75$$

$$s_2^2 = \frac{167940.91}{40} - (61.75)^2 = 4198.5228 - 3813.0625 = 385.4603$$

$$t = \frac{|\bar{X}_1 - \bar{X}_2|}{\sqrt{\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2}}}$$

$$= \frac{61.75 - 44.25}{\sqrt{\frac{61.8375 + 385.4603}{40}}} = \frac{17.50}{\sqrt{\frac{447.2978}{40}}}$$

$$= \frac{17.50}{\sqrt{11.1824}}$$

$$= \frac{17.50}{3.34} = 5.24$$

Since 't' is greater than 3 the difference is highly significant (both at 5% and 1% level)

b. / Comparison of the performance in the two tests for the hostel students.

$$\bar{x}_1 = \frac{1406}{35} = 40.17$$

$$s_1^2 = \frac{60972}{35} - (40.17)^2 = 1742.0571 - 1613.6289 \\ = 128.42821$$

$$\bar{x}_2 = \frac{2356.0}{35} = 66.74$$

$$s_2^2 = \frac{169639.26}{35} - (66.74)^2 = 4846.84 - 4454.23 \\ = 392.61$$

$$t = \frac{|\bar{x}_1 - \bar{x}_2|}{\sqrt{\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2}}}$$

$$t = \frac{66.74 - 40.17}{\sqrt{\frac{128.43 + 392.6}{35}}} = \frac{26.57}{14.89} = 1.78$$

$$= \frac{26.57}{14.89} = 1.78$$

The difference is highly significant since 't' is greater than 3 (both at five percent and one percent level),

APPENDIX VI

COMPARISON OF PERFORMANCE OF THE DAY STUDENTS AND HOSTEL STUDENTS

$$\bar{X}_1 = 61.75$$

$$s_1^2 = 385.4603$$

$$\bar{X}_2 = 66.74$$

$$s_2^2 = 392.61$$

$$t = \frac{|\bar{X}_1 - \bar{X}_2|}{\sqrt{\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2}}}$$

$$= \frac{66.74 - 61.75}{\sqrt{\frac{385.4603}{40} + \frac{392.61}{35}}}$$

$$= \frac{4.99}{\sqrt{\frac{385.4603}{40} + \frac{392.61}{35}}}$$

$$= \frac{4.99}{\sqrt{9.6365 + 11.2174}}$$

$$= \frac{4.99}{\sqrt{20.8539}} = \frac{4.99}{4.57}$$

$$= 1.09$$

Since 't' is less than 2 the difference is not significant at 5% level.

APPENDIX VII

THE COMPARISON OF THE SCORES OF THE DAY STUDENTS AND HOSTEL STUDENTS

$$\bar{X}_1 = \frac{1708.8}{40} = 42.72$$

$$s_1^2 = \frac{88274.78}{40} - (42.72)^2 = 2206.8695 \\ - 1824.9984 \\ = 381.8711$$

$$\bar{X}_2 = \frac{1767.6}{35} = 50.50$$

$$s_2^2 = \frac{105052.02}{35} - (50.50)^2 = 3001.49 - 2550.2500 \\ = 451.2400$$

$$t = \frac{|\bar{X}_1 - \bar{X}_2|}{\sqrt{\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2}}} \\ = \frac{50.50 - 42.72}{\sqrt{\frac{381.8711}{40} + \frac{451.2400}{35}}} \\ = \frac{7.78}{\sqrt{9.5468 + 12.8926}} \\ = \frac{7.78}{\sqrt{22.4394}} = \frac{7.78}{4.74} = 1.64.$$

Since 't' is less than 2 the difference is not significant at 5% level.