Nature Farming and Vegetable Production in Bangladesh

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Abstract
Bangladesh had been practicing a true nature farming in her agriculture until 1960. No agricultural chemicals had been used in crop production prior to that time. Recently, however, many progressive farmers have started to understand the benefit of using fertilizers and insecticides for reaping a good harvest of quality produce. In case of vegetable production, however, use of these chemicals is still in a low profile. Vegetable growers of this subsistence farming community grow vegetables mainly around their homesteads where the land is generally more fertile than the land used for field crops. The general yield level of vegetables in Bangladesh is very poor because of lack of good seed, good varieties, inability and reluctance of the growers to use agrichemicals, and lack of incentives due to improper marketing facilities. Increase of total vegetable production is essential to help solve the nutritional problem and thereby the food problem. Among the many ways and means of increasing vegetable production, improved nature farming technology may have a reasonable role to play.

Introduction

Even though the economy of Bangladesh was never strong during the past couple of centuries, the country used to be self-sufficient in food and the people were generally well-to-do. But since the colonial rulers did not obviously pay attention to the well-being of the people, food production could not keep pace with the ever increasing population. As a result, food shortages and malnutrition have become chronic problems. Rice, the staple food, contributes more than 80 percent of our daily food intake. Although vegetables form an indispensable part of our daily diet, they contribute a very small percentage of total food intake partly due to short supply and health unawareness. If we can grow more vegetables, the problem of existing acute malnutrition and food shortages might be overcome to a significant extent. Under the socioeconomic conditions of Bangladesh, an improved nature farming technology may be worth trying in improving vegetable production.

Nature Farming in Bangladesh

A true nature farming had been in practice in Bangladesh until recently. Prior to the 1970s almost no farmers used any sort of agricultural chemicals. About 30 years ago the government began promoting fertilizer use among farmers for increased crop production by supplying fertilizers to them at a nominal price. Today most farmers are aware of the benefit of using fertilizers. But the use of fertilizers in vegetable production is still minimal. Reasons for this are:

1) Vegetables are grown around homesteads on a small scale, so the growers do not bother to buy fertilizers.
2) The land around homesteads is generally rich in organic matter and more fertile than other agricultural lands.
3) Due to subsistence farming practices, the vegetable growers are satisfied with what produce they get without using agrichemicals.
4) Many people believe that the vegetables grown using fertilizers are less tasty than those produced without fertilizers.
5) Fertilizers are too costly for most farmers.

Today, the use of insecticides on vegetables is negligible, and the use of herbicides has not yet started in the agricultural sector. Sometimes total crops fail due to attack by insect pests. Even under such a situation, an insecticide is not used because of:

1) Ignorance;
2) Unavailability of the required small amount of insecticide;
3) Lack of sprayer;

4) High price;
5) Lack of application knowledge; and
6) Danger of health hazards.

There are, however, a limited number of commercial vegetable growers who use both fertilizers and insecticides to reap a good harvest of quality produce. Due to a lack of knowledge about the safe time-1ag between the last insecticide spray and consumption of the vegetables, it is often dangerous to eat the vegetable procured from these commercial growers. Unfortunately, the potential consumers are not generally aware of such a danger.

Vegetable Production

Vegetables occupy a small part of the total cultivated land area of Bangladesh. It is extremely difficult to estimate accurately the total area under vegetables and total production because of scattered small holdings. The area cultivated and total production of vegetables estimated by the Bangladesh Bureau of Statistics is shown in Figure 1. Clearly, the area under vegetable cultivation is small, and has been increasing very slowly. Total vegetable production and the annual rate of increase are also limited. In 1983, a total of 2.71 million Mg of vegetables was produced on an area of 0.31 million ha with an average yield of only 8.7 Mg ha^{-1}. The availability of vegetables per head per day is only 82 g, whereas the nutritionists suggest that, on an average, a person should eat at least 235 g of vegetables a day to maintain good health. This standard is based on the assumption that enough other nutritious food items like meat, milk, egg, fruits, etc. are consumed. These foods are also in scarce supply in Bangladesh. Hence, the standard requirement of vegetables for Bangladeshi people might be much higher than 235 g a day. If the Bangladesh vegetable requirement is calculated based on a conservative estimate of 235 g per day, the present annual vegetable requirement would stand at 10.2 million Mg for the current population of 120 million. In order to raise total vegetable production to 10.2 million Mg, we would need to increase production by 7.5 million Mg, a 300 percent increase.

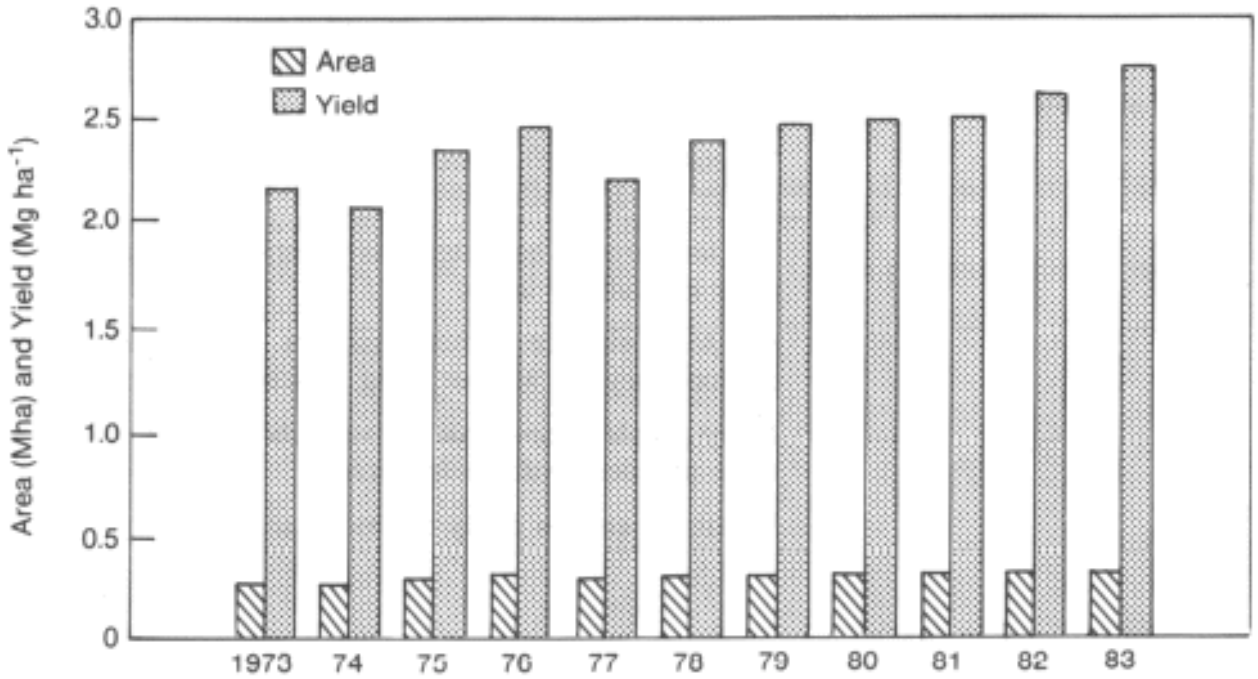

Figure 1. The Area Under Cultivation and Production of Vegetable in Bangladesh from 1973 to 1983.

Food Problems and Vegetables

Currently, Bangladesh has an annual food shortage of 2 million Mg. Since rice is the staple food, we really are talking of a rice shortage. For this reason, the government tries to make up the food

shortage by importing rice and by increasing local rice production. This solution requires spending a lot of hard earned foreign currency on imported rice, and doesn't address the acute nutrition problem of the nation. A vast majority of the people suffer from malnutrition. Unless this nutritional problem is addressed as part of the chronic food problem, it is unlikely to be overcome. Since the bulk of the population is poor, they cannot afford to buy enough nutritious foods like meat, milk, etc. As a consequence, malnutritional diseases are common, especially among the peasants. Solving the nutrition problem will result in good health and a more efficient work force. In addition, the food problem will be taken care of automatically and in a much cheaper way. To achieve this, proper emphasis must be placed on the improvement of food items other than rice. Bangladeshi people eat too much rice, to the exclusion of other foods. On an average, each person eats 425 g of rice while he needs only 375 g. If the people can be motivated and their diet modified to consume only the required amount (375 g) of rice, an amount of 50 g rice per head per day would be saved leading to a total saving of 2 .2 million Mg of rice per year. This amount is slightly higher than the annual food deficit. The savings will be possible only if rice is replaced in the diet by other food items like vegetables. As mentioned earlier, we need to increase vegetable production by an amount of at least 7.5 million Mg. If this can be done, vegetable consumption will very likely be increased and the serious deficiencies in iron, calcium, protein, and vitamin A will be overcome. In this way, malnutrition might be eliminated. When calculated on a dry weight basis, our food deficit is 1.75 million Mg, of which 1.28 million Mg may be met by the proposed increased vegetable production. This indicates that, at least theoretically, we may overcome the malnutrition problem by producing an additional 7.5 million Mg of vegetables. This increased vegetable supply may make up almost the entire food deficit of the country.

Vegetable Production Constraints

To increase vegetable production by more than 300 percent, doesn't seem to be too difficult. A number of production constraints must be alleviated to achieve this level of production.

Supply of Quality Seeds

Since good quality seed is a prerequisite for good crop production, we must ensure a supply of quality seeds to growers. Seed quality alone may increase crop productivity by 20 to 25 percent. Availability of good seed is the biggest obstacle to increasing vegetable production in Bangladesh. There are no seed companies in this country. Even though the Bangladesh Agricultural Development Corporation supplies some quality seeds to growers, this does not satisfy more than 5 percent of the total requirement. There are many seed merchants in the country who collect seeds from different sources to sell to farmers. But with respect to quality, their seeds are not always reliable. Without other alternatives, many farmers continue to buy seeds from these merchants. A majority of the growers, however, use seeds collected from their own crop, grown from unstandardized varieties of unknown description. Because of using unreliable seeds of improper or unknown description, many problems arise such as:

1) Total crop failure often occurs when early varieties are planted late. For example, buttoning in cauliflower is common when early varieties are planted late in the winter leading to total crop failure.
2) Crops may fail due to seed borne disease.
3) Low yield is obtained when a variety is not genetically uniform in different characters.
4) Low seed vigor at planting leads to poor germination and poor yield.

To help solve seed problems in Bangladesh, the following measures may be taken:

1) A proper seed industry should be developed in either the private or public sector or both, which supplies enough quality seeds to growers in a timely way.
2) The use of certified seeds should be ensured.
3) Proper seed laws should be enacted and strictly applied.

Climatic Problem

Bangladesh has a unique climate for vegetable production. The year is divided into two distinct

seasons: rabi (winter from October to March) and kharif (hot, humid season from April to October). The rabi season is suitable for most of the vegetable crops due to relatively low temperature, humidity, and rainfall. Irrigation problems during this dry season hinders production to an extent. Nevertheless, toward the end of the rabi season, a market glut occurs. At peak harvest time, the growers do not even recoup production costs by selling their produce. During the kharif season, however, only a few vegetables can be successfully grown. A few cucurbitous crops, aroids, and vegetable amaranths are the main vegetables at that time. The high temperatures and high rainfall of the kharif season are not conducive for most other vegetables. As a consequence, there is always a serious scarcity of vegetables during the kharif season. In addition, the price of vegetables at that time is very high; so much so that vegetable prices often exceed the price of rice.

To improve vegetable production and supply, we should develop varieties suitable for growing in the adverse weather conditions of the kharif season and drought resistant varieties for the rabi season.

Lack of Appropriate Varieties

Bangladesh imports seeds of many exotic vegetables, almost all of which are hybrids and, therefore, the import of such seeds is a recurrent process. Sometimes crops are raised from imported seeds without suitability studies. Often, crops from such seeds totally or partially fail. Varieties of indigenous vegetables are usually poor in terms of productivity, uniformity, and quality. So we must develop our own varieties of both local and exotic vegetables to assure a timely supply of quality seeds.

Improper Cultural Practices

The successful cultivation of most vegetables requires more care than the cultivation of field crops. But our vegetable growers, many of whom are women, are not aware of modern cultural practices. By following traditional methods of cultivation, they obtain low crop yields. By improving the cultural methods of vegetable production, yields may be increased significantly.

High Production Cost

Cultivation of vegetables is more expensive than the cost of producing field crops, in terms of labor and inputs. For this and other reasons, a commercial vegetable industry is not growing.

Poor Marketing Facilities

Due to the socioeconomic conditions of Bangladesh, vegetables are marketed mainly in the towns and cities. Since the transportation system in the rural areas is poor, marketing of perishable vegetables from the rural areas to urban towns is expensive. As a result, the growers are compelled to sell their produce to middlemen at a very low price. Moreover, during the peak harvest season a market glut causes the poor growers to sell their produce at a throw-away price. Under such a marketing situation, the farmers lose their interest in growing vegetables in excess of their own family needs.

Project of Nature Farming with Vegetable

As mentioned earlier, nature farming had been practiced in Bangladeshi agriculture until about three decades ago. Even though many farmers have started using agrichemicals in crop production, almost no vegetable growers use fertilizers and pesticides. For crop nutrition, farmers usually use different organic materials such as cowdung, farmyard manure, and oil cakes. Under such conditions, nature farming technology may help improve vegetable production.

Conclusions

Although the area under vegetable cultivation in Bangladesh is small, the importance of vegetables cannot be overemphasized. Bangladesh is facing a chronic food shortage which is now approaching 2 million Mg per year. For the last few decades, the government has been trying in vain to become self-sufficient in food production. When the planners refer to food they mean rice only, so not much attention is paid to improve the production of crops like vegetables. For the planners, the term food should also include fruits and vegetables which are indispensable in maintaining good health. In

fact, existing acute malnutrition problems could be overcome by increasing vegetable production. To meet the minimum daily requirement of vegetables, i.e., 235 g $head^{-1}$ day^{-1}, we should increase vegetable production by about 7.5 million Mg - an increase of 300 percent. If we succeed in attaining this goal, the present food deficit of 2 million Mg might be reduced and the acute malnutrition problem might be solved.

In the subsistence farming community of Bangladesh, vegetables are grown at homesteads on small pieces of land. Consequently, the use of agrichemicals on vegetables is very limited. Most vegetable growers use organic materials instead of fertilizers. The adaptation of nature farming technology to this situation promises to increase vegetable production in Bangladesh.

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