

Suggestions for Applying the Aquaponics System to the Community Supported Agriculture Vegetable Program

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Abstract: In today's world, dietary nutrition and health are gaining more and more attention. As a result, farms that can meet the needs for better dietary nutrition and health become more and more popular. A research project related to the Aquaponics system has opened the researchers' eyes to the importance of this system [5]. Therefore, this paper mainly studied the application of the Aquaponics system to farms. This paper can be divided into four parts. First, the supportive policies of the government for the system; Second, people's attitude towards the system; Third, profitability of the project; Fourth, advantages and disadvantages. As these can be seen from the following four points, the government has relevant supporting policies, and people have different attitudes towards this system, but most of them are still supportive. In terms of profitability, new shareholding policies are adopted, and more efficient cultivation technologies are used to minimize risks. Such a system does not require pesticides or labor, which maximizes costs in both areas.

1. Introduction

A lot of biologists and agronomists have developed a new type of farming system, Aquaponics. In fact, the farmers in ancient China have been using this system to cultivate crops for a long time, so the system, when introduced online for the first time, seemed strange but familiar for most Chinese farmers. Now research on Aquaponics has matured. The instruments and fish required for daily nourishment have all been clearly identified [4]. Moreover, the Aquaponics system has been introduced at the Ai Wei farm in Qingdao, Shandong province, China, and the unique table is used to rotate continuously for 12 hours during the day so that the vegetables planted on it can receive the sunlight evenly. However, this system has not been widely used in agriculture, so it is still of practical significance to study the application of this system in real-world production. Here are some of problems that farms are facing today: how to maximize the application of this system to farms and make profit; how to improve people's attitude towards the system; how to improve people's satisfaction with the government's community supported agriculture (CSA) program. At last, there is also a small idea for a family farm.

2. Problems of the CSA program

2.1 Consumers don't face the risks with farms

Community supported agriculture is a program in which vegetables and fish are produced by producers and in a community-run pattern to provide food to consumers who provide the funds needed for production and share the risks with the farms. However, in most cases, consumers to share profits but not losses. Therefore, according to the previous example, after the producers complete all consumer orders, the farms will produce a certain amount of surplus vegetables. Even if they are distributed to individual producers, the rest of them are still wasted, the loss incurred by which can only be borne by the farm itself. In addition, the losses caused by vegetable pests or local natural disasters are also usually borne by the farms. In that way, the original intention of the CSA program, which expects that consumers and producers should share both risks and profits, is violated.

2.2 The farm cannot meet the needs of all customers

After learning about the CSA program in many western countries, most consumers cannot decide what vegetables are provided to them, which undermines customer experience, though they may speculate every day what to eat, which attracts their curiosity of the unknown. It is very innovative and creative, but if they open the box that all vegetables are what they do not love or fall short of their expectation, the consumer experience end up poor. After this order, consumers will choose to buy some fresh vegetables in supermarket instead of continuing to take this program.

Besides, due to the local climate, natural conditions and traditional cultivation methods used by farms, some vegetables and plants which can be raised under certain conditions will not be considered in the farming range. Thus, in many situations, it's going to have a big impact on user satisfaction, but not if consumers don't care what they eat every day and only care about the health of the food [6].

2.3 Financial and cash flow issues measured by farms

Although the premise of this project is that consumers provide funds for agricultural activities, a large amount of capital is needed in the early stage of preparation, including the purchase or lease of land, the purchase of some agricultural equipment and the construction of some greenhouses. Agriculture is a business which means big investments at the beginning and slow returns afterwards, as opposed to the industries with fast cash flows, so these farms are often built in the countryside far away from the hustle and bustle of cities. Equipment transport, vegetable transport and the introduction of some relevant technicians are all very expensive. It is largely insufficient to rely solely on consumers investment in agricultural activities. In addition, without financial support on farms, in the whole process of development of agriculture and new technology research, they will suffer continual losses and finally be phased out in the market. Therefore, a stable capital chain plays a significant role in the whole process.

3. Suggestions for Applying the Aquaponics System to the CSA Vegetable Program

3.1 Improve user experience, motivation and interests

Most of the time people try to participate in agricultural activities because they haven't experienced before, so if the same experience repeats every time, their experience won't be improved much. Therefore, this new Aquaponics technology can be used to attract people. Imagining that when you walk into a garden, everything you can see will be turned upside down. For example, various species of fish are farmed on the ground and all of them are edible. Consumers even can consider to bring the fish home. If they look up, they will realize that they are surrounded by a variety of vegetables whose roots can be seen clearly because of soilless cropping techniques, and if they look carefully enough, they can even track the vegetables' growth over a short period of time[1].

In the process of participation, farmers will explain it to the consumers the whole operation process of the project, from selecting materials, cultivating seeds, ripening fruits, picking, sorting, to packaging and distribution. When the whole process is presented, there is nothing to worry about. After all, consumers are part of the project, and they may be invited to engage in some practical agricultural activities when necessary so as to obtain food through their own hard work, which makes them cherish and save limited resources than in the past [3].

When the project reaches the mature stage, farms will properly raise some animals for slaughter and play to provide better user experience for consumers, in order to attract more people to the program. Of course, the waste from these animals can also be used for vegetable fertilizers after decomposition, but it also consumes more human resources.

3.2 Increase functions

The answer to the question whether people can choose the vegetables they want each week is still no. Everyone has different needs for their vegetable supplement, which will make the whole farm very messy. So, when the new members come in, farmers will ask them to pick some seeds and

plant them within an area of land of 5 square meters. These small areas will be divided into separate patches to facilitate unified management, and also for consumers to visit their "small gardens" easily. Once ripe, vegetables from these specific areas will be delivered to consumers on time in each season for their consumption.

3.3 Develop "balcony economy"

As we all know, farms need capital investment to support its development. Instead of looking for some unstable investment, it is better to find a way through the farm itself. The production and distribution of vegetables need to consume a large part of human and financial resources. Therefore, farmers will bring some consumers who have cooperated with them for a certain length of time into a group of senior members, and make some small Aquaponics system models and move these systems to consumers' balconies. In this way, consumers can add some vitality to their family and understand the whole system more deeply than before, which is also a good way for the children to better understand the world. Thus, this little programme is called "balcony economy." Consumers, according to themselves, can cultivate a few plants that they like and fish at home. As those vegetables mature, they can be interchanged with other consumers' same species, or they can also be eaten by consumers themselves. Perhaps, some consumers only regard this system as a landscape at home. Of course, this does not affect the farm's weekly vegetable supply [2].

After experimenting with and succeeding in this project, the "balcony economy" may become an advanced way for farms to make money. We can market this little system individually to customers who don't want to be served by our CSA Vegetable program and who want to experience this system by themselves. We will teach them cultivating and developing skills, and then let them explore the fun by themselves. It is believed this branch project will bring farmers enormous profits.

4. Suggestion

For the CSA program, it needs strong support from the government. Because applying the Aquaponics system to farms needs to spend a large amount of funds. In some cases, if there are some government appeals and propaganda that can make the farm get a higher and more stable financial chain, it will be very beneficial to the farms' development.

For consumers, there is no denying that the cooperation between farms and consumers is very important. In such a model, consumers and producers have a mutually beneficial relationship. However, most consumers do not want to take risks, but want to maximize their profits. Therefore, it's important to change the consumer's attitudes. This requires consumers to use their spare time to participate in some farming activities, to exchange ideas with farmers, to give suggestions and to help the farmers make improvement together. Also, they can recommend their relatives and friends to join the program. After all, the increasing number of consumers can achieve better quality of output.

For farms, in addition to vegetable planting, distribution and daily management are also of great significance. Bosses need to communicate more with employees and understand the problems that they encounter so that they can fix them quickly. Introduction of the Aquaponics system, a new technology, is bound to face problems, which require great patience to understand and solve. By correcting old agricultural habits, it is important to establish a new farm operation structure so that people who work here can have a clear idea of what they need to do every day. In addition, it is important for managers to develop appropriate strategies to raise the profile of the new farm in the community, which is based on local policies and people's needs. The boss aside, employees must establish a good working attitude, be responsible and positive at work. While growing existing vegetables, it is important to cultivate new varieties and contribute to the farm for these employees. Besides, employees should actively communicate with the members of the farm and guide them to participate in activities, which plays a vital role in the development of the farm and the CSA program [3].

5. Conclusion

Managing agricultural products under the CSA model is a nascent initiative in China. Up to now, the old ways to grow and sell agricultural products are still widely used, which costs a lot of resources and does great harm to our natural environment. Therefore, only through continuous innovation and exploration of new agricultural methods, popularization of the CSA model and application of Aquaponics can we conduct agricultural activities efficiently. Thus, it can improve the quality of life of all people and protect the ecosystem.

As mentioned before, customer satisfaction and some other factors from the farm itself determine whether such a project can be successfully operated. In other words, if the customer does not share the risk with the farm and the farm cannot meet the customer's needs, farms can adopt the relevant suggestions mentioned above to solve the problem. But this is not enough. When investigating farms, some farms nearby and some relatively well-known farms in my country can be seen as important, thus, the conclusions and suggestions drawn in this way are not applicable to large-scale agricultural production. Therefore, it is necessary to set a scope for future investigation and research, and make suggestions within the range. Only in this way, these suggestions can play a more effective role in improving the farming efficiency.

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