

# Organizing Organic Vegetables Farming in Narrow Land: A Study of Social Entrepreneurship Community

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**Keywords:** empowerment, food empowerment, organic vegetables, technology.

**Abstract:** This study aims at organizing a family-based food empowerment; applying technology for organic vegetable farming in narrow land; and improving technical, price, and economic efficiency on production factors. The subjects of this study are housewives in Gunungpati, Semarang by employing an exploratory sequential mixed methods research design. The technology used in this activity is quite unique since the organic vegetables are cultivated using polybags considered as a pot or a place to grow vegetables. Treatments for disease control and pest vegetables harness the local herbs as an environmentally friendly medicine. The results show that organic vegetables produced by a housewives group meet the needs of food consumption, especially on vegetables. Vegetables cultivation sustainably maintains the family's food self-sufficiency and lead to semi-commercial needs of the surrounding communities. Housewives community are pleased, satisfaction and become more productive in terms of economic matters.

## 1 INTRODUCTION

The demand for organic produce in developed countries keeps growing year by year (Wier & Calverley, 2002; Dangour et al., 2009; Detman & Dimitri, 2010). Take organic vegetables as examples. The growing population of middle class is taking the lead in purchasing them. They are even willing to offer more money as long as they obtain goods which are not only healthier but also environmentally-friendly. Increased awareness of a better place to live, a healthy lifestyle, supports from government policies, food industries, and markets taking up 50% of organic products, high prices among consumers, "organic" labelling, and adamant national campaigns on organic farming are the main factors in driving the demand for organic vegetables.

Furthermore, farmers apply farming conservation in an organic manner due to matters such as environment, social economy, independence, and health (Baudron et al., 2012). In Indonesia, organic farming has been developing for about five years which is expected to gain more profitable outcomes. However, they turn out to be not fulfilling, especially

for those who do not own adequate farming land, because of unpredictable all year round rainfall levels (2016-2017) resulting in damaged crops. One apparent cause for this to happen is the way they manage the cultivation which is still conventional. A number of emerging farming development technologies and information cannot easily reach them and change their mind-sets and styles in farming. This is where a social entrepreneur comes to the rescue to undergo systemic changes on social environment by encouraging social changes (Nicholls, 2006).

Gunungpati, Semarang, Central Java, is one of regions famous for producing durians and rambutans. Besides, it is also well-known for other nature potentials, such as tourism spots like Goa Kero and Sendang Abimanyu, fishing spots (Ngrembel Asri, Dewandaru, and Pagersalam), and Jatibarang Lake. Grounded on its landscape characteristic, Gunungpati consists of impressive natural resources, such as geographic location, climate, soil and topography, water, biota (flora and fauna), sound, scenery, settlement patterns, and architectural structures. With a good and proper policy and management, such

promising nature potentials will lead to an abundant supply of quality products.

The growth and development in Gunungpati as the green belt of Semarang is closely related to the aspect of social economy of the people who earn their living from growing fruit and laboring as their side jobs. The latter is necessary for them to meet their daily needs as growing fruit is seasonal. Most of them are not intensive farmers. They grow fruit for their own consumption and sell the rest of it. Besides, they own limited size of farming land. Cultivating organic vegetables in narrow land around their houses can be an alternative way that should be taken into consideration, for it can not only fulfil their needs on hygienic food but also preserve the nature. A model of efficient and effective cultivation is required for this to happen.

Unfortunately, field based observation indicates that there are some issues which are likely to be obstacles to the people of Gunungpati's real income when starting a business of organic vegetables cultivation, namely: (1) a small number of people who are into cultivating them; (2) inadequate farming land; (3) insufficient technology to function narrow land; and (4) the people's lack of knowledge on the cultivation of organic vegetables. The state is not only the responsibility of the government but also all social elements. A harmonized cooperation among the government, farmers, and intellectuals must occur in order to enhance the productivity of farming products, especially the organic ones which are not only environmentally-friendly but also safe for daily consumption.

Pioneering organic vegetable business is an innovation that can be done to increase family income. This refers to the research results of Ulfah & Dewanto (2014) which is found that if the producer developed a product innovation follow the rapidly changing world, make the consumer give more interest in to the local product. That indication could build an engagement between local producers and consumers. Nevertheless, creating business innovation in the form of organic vegetable farming is not the only solution in empowering the community for economic strengthening. Innovation does not mean anything without the competence to manage the business. Loh & Dahesihsari (2013) found that entrepreneurial quality and business success depend heavily on personal characteristics of business people (in this study are women), not on any formal education system or training. The study also found that many women were able to develop a strategy of anticipating a strong business failure. As a

consequence, they are able to develop despite facing many social, cultural and political barriers.

This research further examines: (1) how family-based food security model is; and (2) how the cost and benefit of cultivating organic vegetables in narrow land are. The research also aims at providing short-term benefits, namely (1) as an activity for housewives and the members of local youth organizations not only to be entrepreneurs but also to meet daily needs on food, (2) making use of vacant land in the neighbourhood, and (3) as a piloting project of cultivating hygienic and efficient organic vegetables. The long-term one is for how this farming can be used as a piloting project associated with integrated family-based conservation and security food pro-gram before applied widely and also as a chance to export organic vegetables to international markets.

## 2 LITERATURE REVIEW

Conventional farming refers to a farming system making use of synthetic chemical fertilizers and pesticides and other materials to manage weeds and pests leading to potential risk to humans and other life forms and unwanted side effects to the environment, such as pollution, residual pesticides on food, health issues, loss of useful wildlife, growing resistance of insects and pathogens, and pest resurgence (Arya et al., 1996). This farming method can be developed further provided that farmers are in possession of a large amount of capital and able to predict the weather and prices to cover production cost. Agribusiness as a commercial farming invasion may grow as what occurs in Zimbabwe (Kinsey, 2010). On the other hand, the use of synthetic fertilizers poses a likely threat to soil fertility. In fact, they can enhance the production of nutrients needed for soil fertility, yet they may also disrupt absorption and balance of other nutrients in the soil and reduce the growth of soil microbes causing the production of humus to suppress (Glass, 1987). To lessen these hazards, an alternative technology-based organic farming in the form of recycling soil nutrients by utilizing organic residues as fertilizers and nitrogen fixation, employing natural enemies and cutting down chemical substances needs to be developed.

Organic vegetables farming is an organic agriculture which is supposed to be managed well and intensively in the form of a firm with a complete structure organization and transparent job descriptions in order that its fixed and variable costs function effectively and optimally and guarantee

products with good quality, quantity, and continuity. The seeds in organic vegetables farming are not derived from genetic engineering or genetically modified organism (GMO), but they are gained from organic farming plantation and do not apply synthetic fertilizers and phytohormones. Soil fertility security is practiced through providing organic and natural fertilizers, plant residues, and legume rotation and avoiding the use of synthetic and chemical pesticides while weeds and pests are controlled manually with natural pesticides and agents and plant rotation. Synthetic phytohormones and additive substances on fodder and manure are also prevented from use. Post-harvest and food preservation are handled in natural manners.

Nutrient control technology on organic farming is practiced through recycling plant nutrients naturally to enhance biological, physical, and chemical soil fertility. Macro and micro nutrients taken away during harvest are brought back by adding organic fertilizers and plant residues periodically into the soil in the form of either green manure or compost. It is highly recommended that organic fertilizers are obtained from organic substances, such as composted manure, legume residues, and hedgerow cuts organic waste, as well as tithonian diver's folia as a green manure. The applied manure should not be taken from live stocks managed in factory farming. The existing is-sue of narrow land in fact occurs due to planting pat-terns with soil as its direct media. Potting system and polybag nursery can be silver bullets to overcome this issue so that farming activities continue to thrive.

### 3 METHODS

The research is conducted in Gunungpati consisting of 12 villages with 89 hamlets (RW) and 418 neighbourhoods (RT). The people who have already cultivated organic vegetables on a daily basis for more than two years and founded a community, Female Farmers Organization (KWT), called Sri Rejeki, are those from RW 3 of Plalangan with 24 house-wives as the members.

This research is specific, meaning that the subject is family groups, and holistic, implying that it covers the aspects of both agricultural technology and agricultural economics. Both the researcher and the subject are interactively involved at a particular time and context. Regarding the distinctiveness of the subjects, the objects, and the characteristics of the research, it employs exploratory sequential mixed methods, a mixed research method pertaining to a

sequence of activities experienced by the researcher to gather both quantitative and qualitative data (Creswell et al., 2010).

In this research, qualitative data collection is gathered prior to the quantitative ones. It is essential to do so, for the purpose of the research is, at first, to explore the issues being examined, and then proceed with quantitative data which can be utilized to analyze larger samples, so the results of the research can be commended to a population (Creswell et al., 2010). More specifically, the goal of the use of qualitative (Bogdan and Biklen, 1998) and naturalistic re-search method (Kuncoro, 2007) is to observe a natural phenomenon without any manipulation in a con-text of entity. With this approach, the researcher is required to apply inductive procedures to describe the phenomenon with a person as the main instrument. Quantitative method, on the other hand, is in-tended to expose nutrient content of a medium and a plant and to calculate the degree of technical, price, and economic efficiency, and the cost and benefit of cultivating organic vegetables.

## 4 RESULTS AND DISCUSSION

### 4.1 Family-Based Food Security Model

Based on theoretical analysis, family-based food security model is formulated in Figure 1.

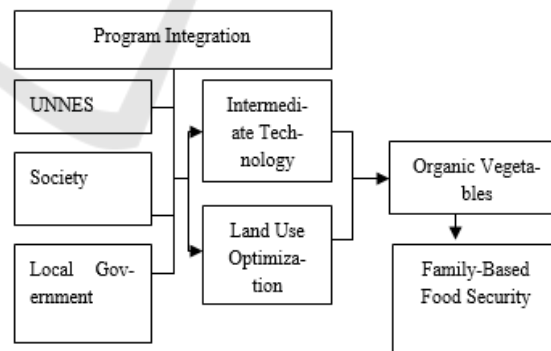


Figure 1: Theoretical model of family-based food security through the cultivation of organic vegetables in narrow land.

This model is tested in the field to be further evaluated and perfected with some inputs and revisions from experts.

## 4.2 Cultivation of Organic Vegetables in Narrow Land

Farming organic vegetables in narrow land in the area of the research makes use of the courtyard and the yard of a house, and the roadsides which certainly do not hinder traffic. The cultivation also exploits domestic waste, such as plastic packaging of mineral water, frying oil, and detergent, paint cans, used buckets and gutters, and other used materials. Tiny size ones are functioned as the substitute of polybags for seedlings. More than one liter/kg size of used materials is used to cultivate organic vegetables and are placed in every vacant nook and cranny of the yard.

The vegetables are planted one by one in the media, such as used paint cans, buckets, and plastic packaging of frying oil holed at the bottom part for water absorption. Approximately two meter long gutters are used to plant vegetables placed in a row. Used plastic is to be recycled, but it can also benefit farmers with an issue of narrow land.

The members of KWT Sri Rejeki also belong to Family Welfare Movement (PKK) of small groups of ten families (Dasa Wisma), RT, and RW. Their effort to undergo family food security through cultivating organic vegetables in narrow land is supported by their husbands, children, and parents. Besides, they also provide treatment of the plants, control pests naturally by taking advantage of local potentials, and market the products after harvest if some are left after meeting their family’s daily consumption. Husbands play roles in preparing the media and plants’ sitting places, and making bamboo hydroponic kit to show their supports whereas children and parents deal with the treatment and harvest. Post-harvest handling includes sorting and grouping based on size and standard to ease the process of marketing the products.

## 4.3 Food Security of Organic Vegetables

Food and Agricultural Organization (FAO) in World Food Summit of 1996 defines food security as follows: “food security exists when all people, at all times, have physical and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life.” Based on the definition, a country is not considered having sustainable food security if its citizens happen to be in famine and lack of nutrition. Thus, food security is any country’s mission, for access to food is human’s right and must be guaranteed by the country. One of many efforts a country can

implement is to provide access to food for the poor in order that they can lead productive life to raise the state of their economic status. Food security is also required for the purpose of growing healthy and quality human resources to increase productivity and national competitiveness and security.

Table 1: The Flow of marketing of organic vegetables in narrow land in Gunungpati, Semarang.

No	Marketing Pattern	Total	Percentage
1.	Farmers → Consumers	23	95.83 %
2.	Farmers → Sellers → Consumers	1	4.17 %
3.	Farmers → Collector sellers → Sellers → Consumers	0	0
Total:		24	100 %

Farming production of vegetables is seasonal and requires particular location. The products are distributed through marketing to consumers. The flow of marketing used by the farmers of organic vegetables in Gunungpati, Semarang, is through direct marketing system, from the farmers to consumers (95.83%). Marketing efficiency is accomplished by analyzing the marketing flow. There are two patterns in marketing organic vegetables in Gunungpati. In general, the pattern is where the farmers market the products to consumer’s first-hand. It is a definitely efficient way of marketing, for the farmers can savor all marketing profit margin for themselves. It is in accord with Soekartawi (1989) who argues that percentage of price margin paid by consumers and producers are not too high. The efficiency supports food security in Gunungpati in particular. Similarly, Baipheti & Jacobs (2009) in their research assert that farming contribution is subsistent to food security in South Africa. In addition, Ahmed & Lorica’s re-search findings (2002) reveal that aquaculture handled domestically improves food security in Asia.

Organic vegetables in narrow land produced in Gunungpati are subsistent, which means that the farmers cultivate them to meet their daily needs, and market the rest if any. If one seeks for polybag plants, they will trade them. Thus, they contribute a great deal in providing nutritious, healthy, and safe vegetables for their family. Moreover, the subsistent characteristic also raises family’s income. Davidova et al., (2012) in their research conducted in European Union support this.

The result of discussion by the research team, experts, and farmers concludes that family-based food security model and the use of narrow land generated based on empirical study in Plalangan is further developed to be gradually disseminated to

other villages or larger society. The model of family-based food security through cultivation of organic vegetables in narrow land which has been developed and gains inputs from experts can be presented in the following figure.

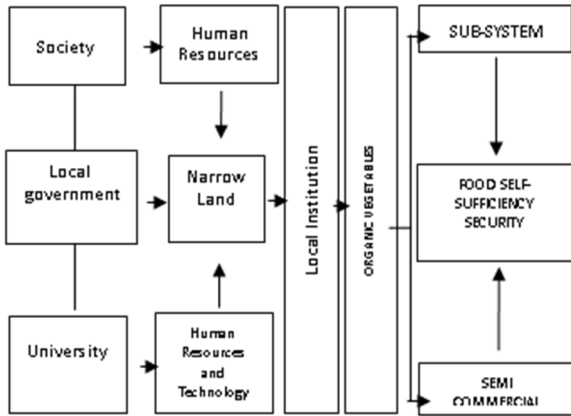


Figure 2: Empirical model of family-based food security through cultivation of organic vegetables in narrow land model.

This improvement model will be applied to conduct dissemination of the implementation of family-based food security through cultivation of organic vegetables in narrow land in defined loci in all villages in Gunungpati, Semarang.

#### 4.4 Cost and Benefit of Family-Based Food Security through Cultivation of Organic Vegetables in Narrow Land

Cost Benefit Analysis is a technique of analyzing cost and benefit involving estimation and evaluating

benefit associated with alternative acts which will be performed (Schniederjans; Hamaker; and Schniederjans, 2004). Cost Benefit Analysis is employed to predict loss and profit of a program. It calculates cost and benefit obtained from carrying out the program. Furthermore, it can be used to detect how good and hazardous a program is. By including profit and social cost, it can function as a firm basis to determine decision making or funding and assure investors as donators of a program, in this case the farmers of organic vegetables, to come to a decision whether to run the business or not.

Data in the field indicate that fixed cost and variable cost needed by the farmers to cultivate organic vegetables are relatively low. They will only bear fixed cost if they provide hydroponic kits for creeping plants on their own. Based on information from the farmers of organic vegetables in Gunungpati, Semarang, the fixed cost of the kit is Rp.150,000.- to Rp.200,000.- depending on the width, and there are only four farmers using them. As mentioned before, the kit will come in handy for certain vegetables requiring media for them to creep, such as chayote, Chinese okra, and bitter melon. Variable cost, on the other hand, covers the purchase of seeds and planting media. However, not all farmers buy planting media. Most of them take the advantage of used cans and common soil as planting media. Land, manure, pesticides, and irrigation practically do not require a lot of money since the land used is privately-owned, the pesticides are self-made, and the irrigation is from their own well.

Table 2: The cost of production of organic vegetables.

No	Kinds of Farming Means	Farmers	Total	Price	Total Cost
<i>Fixed Cost</i>					
1.	Hydroponic Kit	4	1	Rp. 150,000,-	Rp. 600,000.-
<i>Variable Cost</i>					
1.	Seeds	24	4	Rp. 3,000,-	Rp. 288,000.-
2.	Manure	24	0	0	Rp. 0.-
3.	Husk	12	1	Rp. 5,000,-	Rp. 60,000.-
4.	Polybags	12	40	Rp. 250,-	Rp. 120,000.-
Total Cost					Rp. 1,068,000.-

Source: Analyzed data

Benefits in Cost Benefit Analysis are both tangible and non-tangible. The former is income gained by the farmers from selling organic vegetables while the latter is a way for them who mostly are housewives and teenagers to spend their spare or non-productive time doing something useful, in this case farming, so, even without cost, they benefit from what they do such as producing organic vegetables on a daily basis.

Basically, a business is worth running provided that the average return compared to the total cost is bigger than 1 as the higher a ratio of a business is, the higher the profit will be. According to cost and tangible benefit, the ratio of benefit and cost in cultivating organic vegetables is Rp. 1,381,000: Rp. 1,068,000 Thus, the ratio is 1.29 (> 1) indicating that this business is indeed worth running.

Table 3: Income of organic vegetables in Gunungpati.

No	Kinds of Vegetables	Farmers	Harvest (kg)/bln	Price/kg	Income
1.	Bok choy	24	24 x 5 kg = 120 kg	Rp. 5,000.-	Rp. 600,000.-
2.	Leek	22	22 x 0.5 = 11 kg	Rp. 6,000.-	Rp. 66,000.-
3.	Water spinach	8	8 x 1 kg = 8 kg	Rp. 3,000.-	Rp. 24,000.-
4.	Choy sum	8	8 x 0.5 = 4 kg	Rp. 5,000.-	Rp. 20,000.-
5.	Spinach	10	10 x 1 kg = 10 kg	Rp. 3,000.-	Rp. 30,000.-
6.	Cosmos	6	6 x 1 kg = 6 kg	Rp. 2,500.-	Rp. 15,000.-
7.	Lemon basil	5	5 x 0.2 kg = 1 kg	Rp. 7,000.-	Rp. 7,000.-
8.	Celery	5	5 x 0.2 kg = 1 kg	Rp. 6,000.-	Rp. 6,000.-
9.	Garlic chives	20	20 x 1 kg = 20 kg	Rp. 4,000.-	Rp. 4,000.-
10.	Lettuce	2	2 x 1 kg = 2 kg	Rp. 10,000.-	Rp. 20,000.-
11.	Cauliflower	1	0	Rp. 10,000.-	0
12.	Chili	22	22 x 0.1 kg = 2.2 kg	Rp. 20,000.-	Rp. 44,000.-
13.	Broad beans	2	2 x 5 kg = 10 kg	Rp. 5,000.-	Rp.50,000.-
14.	Peas	0	0	Rp. 20,000.-	0
15.	Winged bean	2	2 x 2 kg = 4 kg	Rp. 5,000.-	Rp. 20,000.-
16.	Tomato	20	20 x 0.5 kg = 10 kg	Rp. 7,500.-	Rp. 75,000.-
17.	Long beans	0	0	Rp. 6,000.-	0
18.	Eggplant	20	20 x 1 kg = 20 kg	Rp.5,000.-	Rp. 100,000.-
19.	Bitter melon	4	4 x 10 kg = 40 kg	Rp.5,000.-	Rp. 200,000.-
20.	Cucumber	2	2 x 10 kg = 20 kg	Rp.5,000.-	Rp. 100,000.-
21.	Rhizome	18	0	0	0
Total:			289.2 kg		Rp.1,381,000.-

Source: Analyzed data

## 5 CONCLUSIONS

Cultivation of organic vegetables in narrow land intended to provide activities for society for the purpose of accomplishing family-based food security is able to accommodate local wisdom of the people in Plalangan, Gunungpati by applying family-based food security model which is still required to be analyzed further. Donation from 24 organic vegetable farmer families in Gunungpati as many as 2892.2 kilograms of organic vegetables by making use of narrow land in the yard of their houses is proven to be able to meet FAO recommendation standard in consuming vegetables in big families as many as 144.6 kg/capita/year. Technology of cultivation of organic vegetables in narrow land which is environmentally-friendly supports conservation movement by reusing waste for planting media and

refraining from employing chemical substances during production process. According to the ratio of cost and benefit which is higher than 1, it can be concluded that economically, cultivation of organic vegetables is worth running as a potential business to raise the in-come of organic vegetable farmers in Plalangan, Gunungpati.

The implication in this research is that the dissemination of innovation cannot be done with one-time socialization activity, but must be done continuously to the community, to internalize the productive and innovative mind-set in running the business. The recommended follow-up study to complement and refine the results of this study is research related to the utilization of waste for organic vegetable planting medium.

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