Development strategy of program of Model of Sustainable Food Estate Area (M-SFEA) based on female farmer group for social urban in Siak Regency of Riau Province, Indonesia

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Abstract. Siak regency is one of the districts in Indonesia that has been implementing Model of Sustainable Food Estate Area (M-SFEA) program since 2012, by forming a group of female farmers. However, in the implementation there have been problems such as production facilities and openness in groups of female farmers, which can threaten the sustainability of the implementation of this program. This research aimed to formulate the development strategy of Program of M-SFEA. The number of samples in this study was 42 respondents obtained by using proportional random sampling method, towards the members of female farmer group. Afterwards the development strategy was determined by using SWOT analysis. The development strategy of female farmer group in developing Program of M-SFEA was by: (1) increasing the role of the group as a classroom for learning and inter-group cooperation in the procurement of production facilities; (2) maximizing the potency of large enough yard and strategic location near urban areas in developing farming and marketing; (3) improving group function and cooperation among group members in developing farming; (4) improving network marketing in groups to develop marketing; (5) utilizing the potency for processing of several products as an opportunity for the market of planted commodities; (6) avoiding land conversion from agriculture to other uses.

1. Introduction

Urban agriculture (UA) has been conveying sufficient of attention lately for several reasons: the more of the World's population has switched from living in rural to urban areas; the environmental effect of agriculture is a matter of rising concern; and food instability, especially the accessibility of food, remains a major challenge. UA has often been proposed as a solution to some of these issues, for instance by producing food in places where population density is the highest, reducing transportation costs, relating people directly to food systems and using urban areas efficiently [6].

To support the various functions of urban agriculture, it is necessary to have a city planning strategy that is capable of supporting the successful functioning of the city's

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agriculture. Some functions of urban agriculture and their supporting strategy planning are: (a) As a function of production of urban agricultural commodities and products such as fruits, vegetables, mushrooms, herbs, medicinal plants, meats, milk, cheese, eggs, and other products. It is necessary to provide suitable, accessible, and safe land with good solar access and an irrigation source; (b) As an energy conservation function to produce food locally thus reduces the embodied energy resulting from inputs, transport, and packaging. It is necessary to develop transportation systems and networks to efficiently get food to consumers; (c) As a waste management to organic waste products can be composted and used as a fertility resource for growing food and other products. It is necessary to identify systems to collect, divert, and transport organic wastes away from landfills to urban agriculture; (d) As a biodiversity to agricultural systems that can support a wide range of species, including some native plants, as crops or associated plants. It is necessary to convert some open space areas of low diversity (*i.e.*, turf) to community gardens and farms; (e) As a microclimate control to urban agriculture that can positively alter microclimate through humidity control, wind protection, and shade. It is necessary to allow edible plantings in built areas to combat the heat island effect and other unfavorable climatic conditions; (f) As an urban greening to community and backyard gardens that contributes to the greening of urban areas, improving aesthetics and well-being. It is necessary to support efforts to convert vacant and derelict lands into productive green spaces for use by residents; (g) As a economic revitalization to urban agriculture ventures that offers new jobs for neighborhood residents and vitality from improved economics of the community. It is necessary to create networks to connect laborers, farmers, and markets to help retain and grow new ventures; (h) As a community socialization to community members that may find gardening and farming to be a social activity through sharing food, knowledge, and labor. It is necessary to associate between communities within garden spaces, to integrate other activities and as features to encourage socializing; (i) As a human health to in addition to the known benefits of access to green space, as urban agriculture offers healthy food and encourages physical activity. It is necessary to explore opportunities to develop community programming around gardening/farming as a healthy lifestyle; (j) As a cultural heritage to urban agriculture that can provide access to rare ethnic foods that are typically not available in existing markets. It is necessary to integrate community garden spaces in areas known to have high immigrant populations, and link with culture; (k) As an education to children and adults to learn about foods, nutrition, cooking, environment, economics, and cultures through urban agriculture. It is necessary to offer gardening and urban agriculture activities within existing programs, particularly during summer [5].

Model of Sustainable Food Estate Area (M-SFEA) was developed by the government with the aim of among others: 1) To optimize the sustainable use of the yard to provide for the food and nutrition needs of families and communities; 2) To increase the ability of the family and the community in utilizing the yard land both in urban and rural areas by cultivating food crops, vegetables, fruits and family medicinal plants, raising livestock and fish, processing yields, and processing household waste into compost; 3) To develop seed or seed sources to maintain sustainability in utilization; 4) To develop family productive economic activities so that family welfare can increase and create a clean and healthy green environment independently. The objectives of this M-SFEA program will be realized if all implementers as members of the M-SFEA program can participate in every operation. For the sake of reaching the common goal the members belonging to the female group must be able to work together.

Siak Regency has 14 (fourteen) subdistricts. Based on the 14 (fourteen) subdistricts, there are 2 (two) subdistricts, namely Sialang Baru Subdistrict and Tualang Subdistrict. Each of these sub-districts has 1 (one) village applying the M-SFEA Program. As for the Kecamatan Lubuk Dalam, the village implementing the M-SFEA program is the Sialang

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Baru RT Village. 10 RW. 02. In Tualang Subdistrict, there is Tualang Village RT. 03 RW. 02 who also developed the M-KRPL program. Sialang Baru Village and Tualang Village which became the choices of location of determination as Model of Sustainable Food Estate Area (M-KRPL) by Agricultural Technology Assessment Center. M-SFEA program is an area that became the initial pilot of M-SFEA development which is directly under the supervision of Agricultural Technology Assessment Institute.

M-SFEA program located in Siak District in Sialang Baru Village named Matahari, established on April 20, 2012 and Tualang Village, named Cendana Wangi, was established on November 14, 2012. M-SFEA Matahari all members are housewives and there are also 25 farmers. In M-SFEA Cendana Wangi has members who are entirely housewives who are members of three dasawisma who then joined in a group of 48 farmer female. The development of M-SFEA is expected to increase the ability of members in meeting the needs of food and nutrition sustainably, towards prosperous families so that food diversification can be realized. M-SFEA in the Sun and Cendana Wangi are expected to assist in reducing household consumption expenditure. The inclusion of farmers in farmer groups is motivated by a lot of benefits they can get to develop the business. Referring to the Law No.16 of 2006 on agricultural extension in Article 19 paragraph 2 of the function of farmer group, namely: (1) as a forum for learning process, (2) cooperation vehicle, (3) unit provider of production facilities and infrastructure, (4) production unit , (5) processing and marketing units, and (6) supporting service units.

However, in the implementation there are problems, such as production facilities, availability of water resources, and openness in groups of female farmers, which can threaten the sustainability of the implementation of this program. Therefore, it is necessary to study the formulation of M-SFEA program development strategy, formulated from the strengths, weaknesses, threats and opportunities of this program development in Siak Regency.

2. Methodology

This research was conducted in two villages, each located in two subdistricts in Siak Regency. Siak Regency is one of the regencies in Riau Province that has the potential to develop the agricultural sector. The two villages are Tualang Village located in Tualang District and Sialang Baru Village located in Kecamatan Lubuk Dalam. The selection of research sites was done purposively. The consideration of the place of study was based on the two sub-districts being the village implementing the M-SFEA program.

The research method used in this research was survey method. The survey method was selected in order to review and observe directly the activities that were the targets of research in the field through interviews to the respondents.

Population in this research was all member of female farmer group who implemented M-SFEA program. The two sample villages were taken by proportional random sampling method. The number of samples for each group, namely the female farmer group Matahari was as many as 14 people, and at female farmer group Cendana Wangi was as many as 28 people, so the total sample was 42 respondents. Based on the distribution of the number of samples obtained in each female farmer group, then Simple Random Sampling technique was performed, which was a simple random sampling at each female farmer group in accordance with the division of proportion that has been determined.

The data analysis used by the authors in this research was obtained through descriptive method which is a method in analyzing and describing the research data with theories related to the problem to answer the problem and is able to draw the conclusion presented. To examine strengths, weaknesses, opportunities and threats and formulate a strategy for developing a group-based M-SFEA program, SWOT analysis was conducted.

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3. Results and discussion

3.1. Program principles of sustainable food houses (M-KRPL)

Application of M-SFEA program in optimizing the utilization of yard has target to be achieved. The target is the development of the ability of families and communities economically and socially in meeting the needs of food and nutrition sustainably, to the family and the prosperous community.

The achievement of the objectives of the M-SFEA program is inseparable from the principles consisting of environmentally-friendly yard utilization designed to meet the needs of family food and nutrition, diversification of local resource-based food, the preservation of food crops for the future, will ultimately improve the welfare of society.

Implementation of this program was implemented in 9 stages: preparation, formation of farmer group, socialization, strengthening of group institution, achievement of objectives, training, implementation, financing and monitoring & evaluation.

3.2. Identity of respondents

All respondents (100%) involved were in the productive age, with age range between 20 s.d 60 years, with varied education level (elementary school (57%), junior high school (7%), senior high school (33%) and undergraduate degree (2%)).

Respondents who participated in the M-SFEA program were generally migrants from other provinces who moved to Siak District with their families. Respondents were housewives who were unemployed, so they would have enough time to manage the yard farming. But the experience of KWT members in groups was still small. In general, respondents had never been a member of farmer group, so they did not have enough experience in managing the group.

The total area of land cultivated by KWT members varied 30% of respondents with the area of cultivated area was 2500 m^2 in average, 67% of respondents did farming on 96 m^2 of yard area, and the remaining 3% with 144 m^2 of land area.

When viewed from the experience of respondents in the farm, in general they had ever done farming activities, both cultivated on special farms and on the yard of respondents. So it can be said that the activity of farming was not a new activity for the respondents. So according to the respondents the activities of farming was not difficult and they were used to do so.

3.3. M-SFEA program in Siak Regency

M-SFEA program implemented in Siak Regency, especially in Sialang Baru Village, Lubuk Dalam and Tualang Sub-District, Tualang District, possessed good potential to be developed, both from the enthusiasm of mothers to be more acknowledged in regard of M- KRPL and the following achievement. The achievement was obtained from the activities carried out in the planting in the yard by the mothers who joined the members in the group of female farmers in the two villages. Considering the potency, the farmers' farmyard area in M-SFEA program can be planted with various plants, such as: fruits, vegetables, ornamental plants and medicines.

The implementation of M-SFEA program through the integrated land utilization business activities was an effort to explore and develop the potential of existing yard, and furthermore it was expected that the utilization of yard land can provide comparative and competitive steps besides as a producer of food and nutritious goods for the family, wasalso a medium of learning in developing agricultural business towards agribusiness. Thus the sustainable use of the yard can ensure full food security in every household. Farming as the utilization of farmland yards managed by members of female farmer groups was in average consisted of lowland vegetable crops such as long beans, kale, spinach, chili, sweet potato leaves, eggplant, and peanut.

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At female farmer group Matahari almost all of its members owned a large yard, while at female farmer group Cendana Wangi there were many households whose yard was very narrow, despite owning relatively wide land. Therefore, the vertical model of the shelves provided by Agricultural Technology Assessment Center was more clearly functioning, in addition to looking beautiful and neat if the plants were arranged on the shelves. The open space of yard land could be covered by plants.

Ground kangkung, mustard greens, sweet potatoes, unplug yams, red pepper, small chili, spring onion, celery, onion, small tomatoes, eggplant, long beans, other food crops, fruits and medicinal plants family were also planted by members. Through the utilization of yard land the community members were no longer too dependent on buying food/groceriesin the shop, members could benefit from what is on the yard. In addition to save expenditure, the quality of food crops was guaranteed because it was self-grown and self-treated. In addition to the self-consumption of the garden yard, members also can sell the harvested produces if it happened to be excessive among their food storage . The larger the yard area the greater the proportion of the production of home garden produced for self consumption or for sale.

The high level of participation of M-SFEA group members in Siak Regency was due to the benefits felt by the members through the increase of vegetable farming income as well the ability to reduce the consumption level of household vegetables with the average household consumption expenditure of Rp 92.680 / month and average additional income of the M-SFEA program of Rp 97.214, - / month. This meant that the additional income of the vegetable program has been able to emphasize the level of household expenditure in the consumption of vegetable needs for each member of the group. Changes in member income included savings in household consumption of vegetables where members no longer purchased vegetables from outside or market. Although the income earned was little but managed to help members in the consumption needs of vegetables.

3.4. Role of female farmer group in M-SFEA Program in Siak District

Referring to the Law No.16 of 2006 on agricultural extension in Article 19 paragraph 2 of the function of the group, there are six points: as a medium of learning process, cooperative vehicle, unit of facilities and production infrastructure, production unit, processing unit and marketing.

3.4.1. As a learning process medium. Group of farmer is a forum for teaching and learning for its members to improve their knowledge, skills and characters. And growing and growing independence in the business may lead to productivity increase, income increase and a more prosperous life of members.

As group's medium, it has been utilized by group members to learn and share knowledge in conducting garden farming. In the female farmer group the M-RKPL program held a group meeting to discuss what the constraints faced by members and discussed together to find a solution and usually the meeting was held at the home of the respective chairperson of the respective farmers group, and there was also a meeting for the counseling by the extensive local workers.

3.4.2. Forum for cooperation. Cooperation among members was necessary in the group of female farmers. Achieving the goals of female farmer groups was the role of each group member with the group manager. Farming was undertaken altogether while stayed motivating within female farmers to share information in conducting cultivation, processing of production and marketing of products. M-SFEA group of female farmers had cooperated in managing farms conducted in groups. This was supported by the presence of group leaders who exhibited ability to motivate cooperation between group members.

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The group had also been able to establish cooperation with other parties to get assistance, such as cooperation with Agricultural Technology Assessment Center in obtaining seed assistance that was eventually cultivated by group members afterwards

3.4.3. Unit provider of facilities and production infrastructure. Female farmer group could also be a provider of facilities and infrastructure, meaning cultivated land for some agricultural commodities were cultivated together with members. The cost of land management was covered by group membership fees. Infrastructures were tools used to support activities conducted by groups such as for cultivation activities which required equipments of agriculture, fertilizers and so forth. But the group had not been able to be an effective medium in the provision of facilities and infrastructure needed by members, as subsidized fertilizer was sometimes still difficult to get by farmers.

3.4.4. Production unit. The production unit could be in form of agricultural products. In terms of quantity Siak Regency is a very potential area to develop agriculture. Households in the area still provided large enough land to be planted with various home garden commodities that could be used as household consumption and/or to be sold to markets that are very close to the location of cultivation. Some commodities produced by participants of the M-SFEA program were mustard, lettuce, celery, cayenne pepper, red pepper, eggplant, tomato and spring onion.

3.4.5. Processing unit and marketing. The role of the female farmers group as a medium for the processing of agricultural products had not yet played a significant role, since the activities of the group members still focused on farming by planting household commodities such as vegetables, chilli, tomatoes, etc. The processing of agricultural products was an effort to increase the added value. Processed products were sometimes able to add much greater value than commodities sold in fresh form. Some commodities such as rosella were considered as alternatives that could be cultivated to be processed into syrup and rosella tea.

The harvesting by program participants were generally to meet the needs of participating households. This could reduce expenses (non cash income) for participants. Production that was sold to market like chili. The outcomes of this sale could certainly add up to the family income.

3.4.6. Supporting Services Unit. Farm female farmers groups can be a commerce platform with group members on marketing the farmed crops and processed products. This conjoint marketing would considerably support the program sustainability .

The obtained main results briefly were that urban agriculture; (1) provided an increase of green areas within the urban environment hence the development of urban areas was established in harmony with nature; (2) reduced climate change as it contributed to the prevention of the over-heating of urban environments; (3) provided proper land management and use for urbanized areas; (4) Provided indirect economic benefits, such as multiplier effects, recreational benefits, economic diversity and stability, as well avoided disposal costs of solid waste; (5) was a response of urban poor to access to food supply; (6) provided social and psychological benefits, such as food security, dietary diversity, personal psychological effects, community cohesion and well-being; and ecological benefits, such as hydrologic functions, air quality, soil quality; (7) contributed to the children's education. Subsistence production in urban settlements has long been a common practice in many parts of the World but this has happened in an unplanned manner as a household strategy or during emergencies such as wars. In the case of AOC, agricultural functioning was planned and established accordingly. But, rapid urbanization and the features of being a developing country have degraded the targets of the farming area and some amount of the owned land have decreased. In order

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to protect and progress urban agriculture for the area some main concluding statements were; (8) The support of institutional structures and local governments are needed to nurture the development of urban agriculture (9) A definite legislation related to urban agriculture should be progressed to define the limitation; (10) The government should facilitate solutions by assisting Social Enterprises in planting trees and growing food to neutralize emissions as a means to reduce climate changes; (11) The vast unused urban open areas can be utilized for the benefit of the inhabitants of the cities, as well as a major input for the economy; (12) Urban agriculture has to be included in urban planning for the mitigation of climate change and for poverty reduction. Climate change is a worldwide phenomenon that has to be controlled by using all available means. Urban agriculture is only one of the instruments which can be used for this purpose. Urban agriculture in general, and the case study of Ankara Atatürk Forest Farm in particular possess high potential for being used as a tool to reduce the effects of global warming. Biological, economic and socio-culture conditions created by its existence has contributed for a long-time to keep all types of pollution in the metropolis within certain reasonable limits. However, recent policies aiming at privatizing its landed property for other purposes than the goals set at the beginning tend to undermine the role of the Ankara Atatürk Forest Farm considerably [7].

3.5. Development Strategy of M-SFEA Program Based Group of Farmers

The M-SFEA program has been beneficial for communities implementing programs, especially urban communities, with limited land conditions. However, in the implementation, program participants experienced a tendency to continue to decline due to problems and constraints faced by female farmer groups. In order to maintain the sustainability of this program, there is a need for a strategy to develop this program in order to survive and develop in accordance with the development of the conditions experienced by female farmer groups and the objectives of group members can be achieved.

Strength (S)

1. Members of female farmer groups have the motivation to pursue learning in farming and play a role in the implementation of the program
2. Female farmer groups have the ability to obtain assistance from outside the group.
3. Agricultural commodities produced by group members are potential of Siak Regency.
4. Commodity marketing is cultivated by female farmer group, where the commodity is able to fulfill family food needs and sell well in the market.
5. The location of Siak regency is strategic, close to Pekanbaru city and other cross lanes so it is very easy in developing product marketing.

Weakness (W)

1. The function of the farmers is still less active and there is mutual trust in the group of female farmers.
2. Members of the farmers group find difficulties in procuring production facilities
3. Management of female farmer groups that has not been good.
4. Female's groups have not been able to do the processing of results that can increase the added value of commodities cultivated.

Opportunities (O)

1. Initiation of partnership cooperation between groups and other parties (private) to develop farming and product processing business
2. Establishment of modern markets for commodities and other processed products.
3. Role of government to run coaching (extension) towards female farmers group and provide assistance to develop farming and product processing business.
4. Horticultural commodities and medicines are commodities that are always needed by the community (consumers)

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Threat (T)
1. The occurrence of land conversion, which may affect the availability of land
2. Difficult irrigation during the dry season

S-O Strategy:
1. Improving cooperation between groups in conducting farming and initiating business opportunities processing of farm products
2. Maximizing the strategic potency and location of Siak Regency in the development of farming, processing and marketing business
3. Increasing the role of farmers group for cooperation partnerships with other parties in developing farming, product processing and marketing
4. Improving marketing network to modern market by improving product quality
5. Increasing the role of government to develop farming and product processing

W-O Strategy
1. Improving the function of female farmer groups and cooperation among group members in developing farming, product processing and marketing.
2. Establishing partnership cooperation between farmers and private parties in the procurement of production facilities, capital and marketing
3. Increasing the role of extension in improving the role and management of female farmer groups
4. Improving the role of government to help farmers and entrepreneurs in facilities and infrastructure.

S-T Strategy
1. Developing agricultural product processing business in order to increase value-added commodities, so as to increase revenue and motivate program participants, and to avoid land conversion
2. Establishing good relationships among the farmers so that there is cooperation between groups for the development of farming, product processing and marketing
3. Increasing the number of program participants by motivating and fostering other farm to utilize yard converted into farm.

W-T Strategy
1. Improving the function of farmers in increasing capital and expanding the reach of marketing, so that market demand can be stable.
2. Establishing good communication between groups so that there is cooperation that can be done together.

3.6. Priority of M-RKPL Program Strategy:

Based on the value of weighting against alternative strategies that can be determined, priority strategies in M-RKPL program are:
1. enhancing the role of the group as a classroom for learning and inter-group cooperation in the procurement of production facilities, as well as initiating business opportunities for product processing;
2. maximizing the potency of large enough yard and strategic location near urban areas in developing farming and marketing of agricultural products;
3. Improving group function and cooperation among group members in developing farming;
4. increasing network marketing in groups to develop and improve bargaining position of marketing;
5. Utilizing the potential of processing several products as an opportunity for the market of planted commodities;
6. Avoiding land conversion from agriculture to other uses;
7. Guiding on the group needs to be continued and help to overcome the irrigation.

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Table 1. Matrix SWOT.

Internal / External	Strength (S) 1. Members of female farmer groups have the motivation to want to study farming and play a role in the implementation of the program 2. Female farmer groups have the ability to obtain assistance from outside the group. 3. Agricultural commodities produced by group members are potential of Siak Regency. 4. Commodity marketing is cultivated by female farmer group, is a commodity that is able to fulfill family food needs and sell well to the market. 5. The location of Siak regency is strategic, close to Pekanbaru city and other cross lanes so it is very easy in developing product marketing	Weakness (W) 1. The function of the farmers is still less active and there is mutual trust in the group of female farmers. 2. Members of the Kelompok Tani find difficulties in procuring production facilities 3. Management of female farmer groups that have not been good. 4. Female's groups have not been able to do the processing of results that can increase the added value of commodities cultivated.
Opportunities (O) 1. Opening of partnership cooperation between groups with other parties (private) to develop farming and product processing business 2. The opening of modern markets for commodities and other processed products. 3. The role of government to do coaching (extension) to farmer group of female and provide assistance to develop farming and product processing business. 4. Horticultural commodities and medicines are commodities that are always needed by the community (consumers)	S-O Strategy: 1. Improving cooperation between groups in conducting farming and opening business opportunities processing of farm products 2. Maximizing the potential and location of Siak Regency strategic in the development of farming, processing and marketing business 3. Increasing the role of Kelompoktani for cooperation partnerships with other parties in developing farming, product processing and marketing 4. Improving marketing network to modern market by improving product quality 5. Increasing the role of government to develop farming and product processing	W-O Strategy 1. Improving the function of female farmer groups and cooperation among group members in developing farming, product processing and marketing. 2. Establish partnership cooperation between farmers and private parties in the procurement of production facilities, capital and marketing 3. Increasing the role of extension in improving the role and management of female farmer groups 4. Improving the role of government to help farmers and entrepreneurs in facilities and infrastructure.
Threat (T) 1. The occurrence of land conversion, which will affect the availability of land 2. Difficult irrigation during the dry season	S-T Strategy 1. Developing agricultural product processing business in order to increase value-added commodities, so as to increase revenue and motivate program participants, and to avoid land conversion 2. Establish good relationships among the farmers so that there is cooperation between groups for the development of farming, product processing and marketing 3. Increase the number of program participants by motivating and fostering other farm female to utilize the farmyard yard	W-T Strategy 1. Improving the function of farmers in increasing capital and expanding the reach of marketing, so that market demand can be stable. 2. Establish good communication between groups so that there is cooperation that can be done together

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4. Conclusion

The development strategies of farmer group in developing M-KRPL are as followed; (1) Increasing the role of the group as a classroom for learning and inter-group cooperation in the procurement of production facilities, and initiating business opportunities for product processing; (2) Maximizing the potency of large enough yard and strategic location near urban areas in developing farming and marketing of agricultural products; (3) Improving group function and cooperation among group members in developing farming; (4) Improving marketing network in groups to develop and improve bargaining power of marketing; (5) Utilizing the potential for processing of several products as an opportunity for the market of cultivated commodities; (6) Avoiding land conversion from agriculture to other uses; (7) Guiding on groups' needs to be continued and assisting regarding overcoming irrigation.

References

[1] Badan Ketahanan Pangan 2010 *Modul 03 pemanfaatan dan pengelolaan pekarangan* (Jakarta: Badan Ketahanan Pangan)

[2] Badan Penelitian dan Pengembangan Pertanian 2012 *Pedoman Umum Pengembangan Kawasan Rumah Pangan Lestari (KRPL)* (Jakarta: Badan Penelitian dan Pengembangan Pertanian)

[3] Balai Pengkajian dan Tekhnologi Pertanian 2012 *Petunjuk teknis model kawasan rumah pangan lestari* (Riau: Balai Pengkajian dan Tekhnologi Pertanian)

[4] Iskandar Muhammad Edwina S and Kaswarina S 2015 Peranan program model kawasan rumah pangan lestari (m-krpl) terhadap peningkatan pendapatan rumah tangga di Kabupaten Siak. Jurnal (https://jom.unri.ac.id/index.php/JOMFAPERTA/article/view/5372) (Accessed 10 November 2017)

[5] Lovell and Taylor S 2010. Multifunctional urban agriculture for sustainable land use planning in the United States *Sustainability Journal* **2**(8):2499-2522

[6] Martellozzo F Landry J S Plouffe D Seufert V Rowhani P and Ramankutty N 2014 Urban agriculture: a global analysis of the space constraint to meet urban vegetable demand *Environ Res Lett* **9**(2014): 064025

[7] Meltem Yilmaz, 2009. Urban agriculture and its impact on climate change – Atatürk Forest Farm in Ankara as a sample climate change: global risks, challenges and decisions *IOP Publishing IOP Conf. Series: Earth and Environmental Science* **6**(2009):242043

[8] Yulida R 2015 Analisis tingkat partisipasi anggota kelompok wanita tani (kwt) dalam program model kawasan rumah pangan lestari (m-krpl) di Kabupaten Siak *Prosiding Seminar Nasional Ketahanan Pangan dan Pertanian Berkelanjutan* (Payakumbuh: Politeknik Pertanian Negeri)

[9] Yulida R 2012 Kontribusi usahatani lahan pekarangan terhadap ekonomi rumah tangga petani di Kecamatan Kerinci Kabupaten Pelalawan *Indonesian Jurnal of Agricultural Economics* **3**(2): 135-154

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