

## **The Development of Urban Farming: Systematics Literature Review**

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### **Abstract**

The development of urban farming continues to grow, encouraging the emergence of a joint movement in creating food security, building the environment, economy, and community empowerment. This development trend has also made urban farming one of the leading programs in building food security. This research aims to understand the relevance of urban farming development. The method used is bibliometric analysis in looking at the development of research with the keyword "urban farming. data taken from 2010-2023. The results show that urban farming is considered to be an effective way to improve food security and economic conditions in urban areas. Urban farming has the potential to provide positive impacts in various aspects, economic, social, and environmental. As a commodity production, urban farming tends to be concerned with distribution, marketing and land area. The diversity of literature places urban farming as having development potential that leads to aspects of food security and environmental effects.

**Keywords:** *Urban Farming; Food Security; Agriculture*

**How to Cite:** Ohorella, N. R., Dalimunthe, M. A., & Nasution, F.N., (2022). The Development of Urban Farming: Systematics Literature Review, *Journal of Peasant Right's*, Vol 2 No. 2: page 11-16

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## **INTRODUCTION**

The problem of the decreasing amount of land and Human Resources interest in agriculture is diminishing over time. The development of a labor-intensive model in agriculture is considered irrelevant, but instead using technology. The use of technology can reduce the problem of high food production, but does not need a large land area. Technological innovations encourage high food productivity by utilizing technological innovations in agricultural tools that use electricity and utilize artificial intelligence (Brin, 2023). Through the Ministry of Agriculture (MOA), the government encourages the use of agricultural technology that can adapt to climate change. Problems that threaten food security such as Covid-19, climate change and drought and the global food crisis encourage the use of agricultural technology (Sumut.antaranews.com, 2021a). According to the Global Network Against Food Crises (GNAFC) the number of people facing acute food insecurity, requiring emergency food assistance and livelihood support continues to increase at an alarming rate (Fao.org, 2022; Fightfoodcrises.net, 2023).

North Sumatra Province, which has a vast agricultural sector, develops precision agriculture technology as one of the ways to increase agricultural production. The complex agricultural challenges in North Sumatra drive the need for innovation in increasing productivity. There are several factors that can cause a decline in the agricultural sector in North Sumatra such as; Land conversion, Climate Change, Lack of access to technology and knowledge

(Sumut.antaranews.com, 2021b; Sumutprov.go.id, 2022a; Sumutprov.go.id, 2022b). In overcoming the decline in the agricultural sector, efforts need to be made to increase farmers' access to precision agricultural technology. The need for policies that support sustainable agriculture and land management is an important factor in developing precision agriculture.

The exploration of precision agriculture technology, which began in 2021 (Pencawan, 2021) is still hampered in its implementation. The lack of government support and investment in the agricultural sector can limit the development and modernization of agriculture in North Sumatra to be one of the challenges of its application. According to BPS North Sumatra data, in April 2023, the NTP of North Sumatra Province (2018=100) was recorded at 126.42 or decreased by 0.77 percent compared to the NTP in March 2023, which amounted to 127.40. The decline in the April 2023 NTP was caused by a decrease in the NTP of three subsectors, namely the NTP of the Horticulture subsector by 3.48 percent, the NTP of the People's Plantation Crops subsector by 0.81 percent, and the NTP of the Livestock subsector by 1.65 percent. Meanwhile, the NTP of the other two subsectors increased, namely the NTP of the Food Crops subsector by 0.31 percent and the NTP of the Fisheries subsector by 0.47 percent. The Agricultural Household Business Exchange Rate (NTUP) of North Sumatra Province in April 2023 amounted to 123.58 or decreased by 1.00 percent compared to NTUP the previous month (Sumut.bps.go.id, 2023). Therefore, it is necessary to make efforts to increase agricultural productivity and sustainability in North Sumatra through the application of precision agricultural technology. The formulation of the problem in this study is to involve how the development of the agricultural sector with the application of precision agricultural technology in North Sumatra.

## RESEARCH METHOD

This research uses bibliometric analysis to see the development of research with the keyword "urban farming". Bibliometrics analysis is an analysis of statistical methods to analyze various publications related to academic content. The research steps include; first determining the article database on google scholar, then collecting literature through the help of the Publish or Perish (PoP) application which can be used for bibliographic metadata. Second, determine the deadline for articles to be published. The article period starts from 2010-2023 with a total of 500 journal articles. There are 10 articles that have the highest google scholar ranking (see table 1). Third, the data of the 500 articles were visualized using the VOS viewer application. The four visualizations were analyzed to see the words that are often used to see the issue of "Urban Farming".

**Table 1.** Highest ranked articles GS Rank

CITES	TITLE	GS RANK	ECC	CITES/ YEAR	CITES/ AUTHOR
129	Urban agriculture: connecting producers with consumers	1	129	18.43	43
146	Analysis of factors affecting food security in rural and urban farming households of Benue State, Nigeria	2	146	0,893055556	73
279	Pictures from the other side of the fringe: Urban growth and peri-urban agriculture in a post-industrial city (Toulouse, France)	3	279	55.80	70
97	Development of a simulation-based decision support workflow for the	4	97	16.17	32

		implementation of Building-Integrated Agriculture (BIA) in urban contexts			
108	Urban agriculture in low income households of Harare: an adaptive response to economic crisis	5	108	08.31	36
59	Effect of urban household farming on food security status in Ibadan metropolis, Oyo State, Nigeria	6	59	07.38	20
208	Environmental challenges threatening the growth of urban agriculture in the United States	7	208	0,888888889	104
145	Growing food to grow cities? The potential of agriculture foreconomic and community development in the urban United States	8	145	16.11	73
254	Opportunities and challenges in sustainability of vertical farming: A review	9	254	50.80	64
249	The vertical farm: controlled environment agriculture carried out in tall buildings would create greater food safety and security for large urban populations	10	249	0,885416667	249

## RESULTS AND DISCUSSIONS

Looking at the potential of agrarian reform in Indonesia, there are several changes taking place in this sector. Food needs are no longer limited to meeting needs, but rather become a competitive force in achieving food industrialization. There are several differences in the comparison of the *food estate* system from the present and colonial times as shown in Table 1. Different conditions were seen in the early decades when the failure of the land lease system led to agrarian reform that created export needs towards anticipating the food crisis in realizing food.

Urban Farming is one of the researchers' concerns in looking at innovations in developing modern agriculture. The word *Farmer*, has a wide influence on words that associate with other words. The dominant use is inseparable from other words such as *farm* which has 135 uses. The word farming and urban area is one aspect of the focus of attention, the issue of urban land area is always the main concern in seeing its development. with the use of the words "city" and "urban area",. These words are related to the process of developing urban farming in the city. Ata later stage, the attention tends to be on the production of agricultural products. This can be seen from the use of the words production (43), food (33), and market (25).

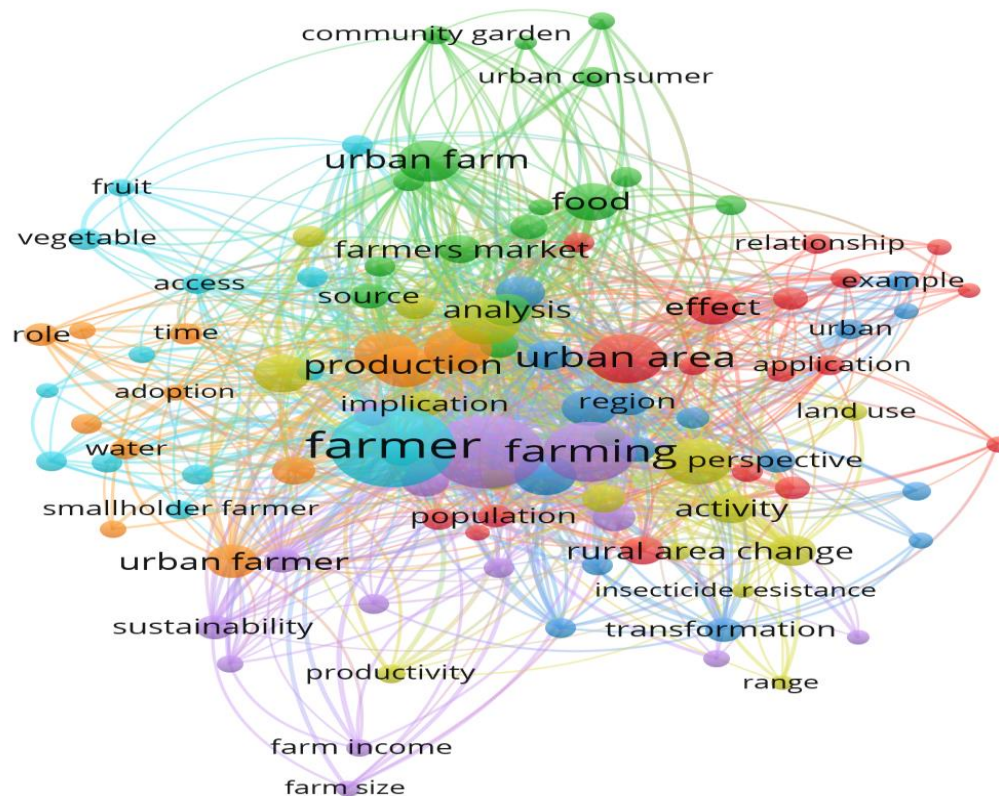
**Table 2.** Popular words used

No	Id	Term	Occurrences	Relevance Score
1	31	farmer	170	0,964583333
2	27	farm	135	0,95
3	33	farming	91	0,846527778
4	90	urban area	59	1,452777778
5	12	city	50	1,811111111
6	7	area	49	0,216666667
7	4	agriculture	47	1,0375
8	66	production	43	0,169444444
9	98	urban farming	43	3,999305556

10	96	urban farm	42	4,410416667
11	45	land	39	2,459027778
12	89	urban agriculture	34	4,259722222
13	35	food	33	4,475694444
14	20	development	32	2,378472222
15	22	effect	28	3,060416667
16	97	urban farmer	26	5,697222222
17	5	analysis	25	1,760416667
18	50	market	25	3,422222222

The word Agriculture (47) is the dominant concept in describing the development of urban farming (43). In its development, both words have a dominant use in looking at the issue, so the use of the word "analysis (25) is used to look at the program. The words "development (32)", "land (39) and (effect (28) see the issue of urban farming as an important need in the development process. The expected impact with limited land will encourage a growing level of production. This will encourage the use of broad marketing in seeing the problem.

The main concern of researchers during the 2010-2023 period was that actors became the focus in looking at the phenomenon of urban farming. Farmers are the driving force behind the issue. This main focus places land area and food crisis not as a concern in research development. This means that farmers become.



**Figure 1.** Research Topic Mapping: Content Analysis

The development of Urban Farming has become a concern in seeing the potential for development. In the visualization found, there are 106 items and 7 clusters that appear, links 1727 total link strength 3407. The first clusters consisted of 18 words that often appeared shown in red color including Application, Barrier, context, effect, environment, family, location, organic, farming, person, population, relation, relationship, risk, rural area, rural-urban migration, and urban area. The second cluster consisted of 17 words that often appeared shown in green color

including analysis, community garden, consumer, farmers market, food, livelihood, local food, peri-urban farmer, place, product, rural farmer, source, strategy, urban consumer, urban farm, urban population, and urban resident.

Cluster three consists of 17 words that often appear shown in light blue: community, development example, growth, land, market, migration, peri-urban farming, perspective, region, rural household, transformation, urban, urban center, urban expansion, and village. Cluster four consists of 15 words that often appear shown in yellow: activity, area, change, city, contribution, distribution, food security, form, implication, insecticide resistance, land use, productivity, range, soil, and urban agriculture. The fifth cluster consists of 14 words that often appear shown in purple: challenge, climate change, determinant, farm, farm income, farm size, farm worker, farming, impact, opportunity, peri-urban area, prevalence, sustainability, and urbanization. The sixth cluster consists of 14 frequently occurring words shown in light blue; access, building, evidence, farmer, focus, fruit, increase, problem, quality, small farmer, smallholder farmer, urban center, urban market, and vegetable. The seventh cluster consists of 12 frequently occurring words shown in orange; adoption, agriculture, income, nature, process, production, role, technology, time, urban farmer, urban farming, and water.

## CONCLUSION

Urban farming is an effective way to improve food security and economic conditions in cities. Urban farming has the potential to provide positive impacts in various aspects, economic, social, and environmental. The main concern of research in looking at urban farming as an agricultural production commodity tends to pay attention to issues of distribution, marketing, and land area. This means that this research can help further research on urban farming. The diversity of literature places urban farming as having development potential that leads to aspects of food security and environmental effects. These environmental effects are related to providing an air-friendly environment in urban areas and utilizing organic waste materials for plant cultivation. These positive trends can help in promoting food security. In optimizing the implementation of urban farming, it is important to provide support and regulations, because of the positive potential to improve food security, the economy, social welfare, and the environment. With a series of positive benefits, it is important to prioritize the development of urban farming in various cities.

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