Natural Resources for Human Health
eISSN: 2583-1194

Original Research

Received 22 July 2026
Revised 18 Aug 2026
Accepted 05 Sep 2026

Natural Resources for Human Health 2026, Vol. 6 (20s): 272–277

KEYWORDS:
Sub-urban vegetable growers, Livelihood, Vegetable farmers, Profile characteristics, Urbanization

Correlation Between Livelihood and Profile Characteristics of Sub-Urban Vegetable Growers

[1]Ghate M.J, [2]Kalamkar R.B.*, [3]Shitole P.A, [4]Karadipatil Shweta and [5]Harsh Parmar

[1]Student M.Sc. (Agriculture), Division of Agricultural Extension Education, Dr. Sharadchandra Pawar College of Agriculture, Baramati, Maharashtra.
[2]Associate Professor, Kishorbhai Institute of Agriculture Sciences and Research Centre, Uka Tarsadia University, Bardoli, Gujarat.
[3]Assistant Professor, Dr. Sharadchandra Pawar College of Agriculture, Baramati, Maharashtra
[4]Assistant Professor, Division of Agricultural Business Management, International Institute of Management Studies, Pune, Maharashtra.
[5]Assistant Professor, Kishorbhai Institute of Agriculture Sciences and Research Centre, Uka Tarsadia University, Bardoli, Gujarat.
Corresponding Author Name – Kalamkar Rushikesh B. / kalamkarrb2016@gmail.com

ABSTRACT: The present study was carried out in Pune district, located in the state of Maharashtra. This district was chosen due to its high levels of urbanization, industrial development and rapid population growth. Haveli tahsil was selected for the study on the basis of level of urbanization. Within Haveli, twelve villages were chosen. From each village, ten vegetable growers were selected using a simple random sampling method, resulting in a total sample size of 120 respondents. An ex-post facto research design was used for research. An interview schedule was prepared to gather the required information. The collected data was analyzed using appropriate statistical techniques. The research study was carried out during the year 2024–25 with the objective of analyzing the profile characteristics of sub-urban vegetable growers and examining their relationship with livelihood in Haveli tahsil of Pune district. The analysis revealed that variables such as education, landholding, area under vegetable cultivation, annual income, irrigation status, decision-making ability, risk orientation and extension contact exhibited a positive and significant correlation with the livelihood of sub-urban vegetable growers. In contrast, market access showed a positive but non-significant relationship with the livelihood of sub-urban vegetable growers. Age demonstrated a negative and significant correlation with the livelihood of sub-urban vegetable growers.

1. INTRODUCTION

Suburbs are defined as areas located just beyond the boundaries of a town or city, particularly residential regions adjacent to urban centers (Oxford English Dictionary, 2011). According to the Food and Agriculture Organization of the United Nations, semi-urban agriculture involves farming practices within and around cities that compete for essential resources such as land, water, energy and labor, which could also be used for other urban needs. As rural regions transform into urban spaces globally, suburbs and peripheries are simultaneously experiencing growth. Urban areas are expanding outward at an accelerated rate, contributing to the rise of suburban regions (Gogoi, 2022).

Pune, a city in Maharashtra, known as the "Oxford of the East," has been undergoing rapid urbanization. Several factors contribute to the city's urban expansion, including high urbanization rates, affordable land prices on the outskirts, unregulated land development, lower taxes and the availability of unused land. (Gaikwad, 2022). The population of the Pune Metropolitan Region (PMR) expanded from approximately 2.5 million in 1975 to over 9.13 million by 2020 (Schiavina *et al.*, 2022). Between 2001 and 2013, about 52.6 km² of green spaces, including grasslands and agricultural lands, were converted into built-up areas (Kantakumar *et al.*, 2015). As rural areas continue to urbanize, urban and sub-urban agriculture is anticipated to play a crucial role in ensuring food security and nutrition. This type of agriculture is expected to be particularly vital in meeting the needs of the approximately 700 million urban residents currently residing in developing countries, especially given the projected urban growth in these regions (Nandini, 2018). The livelihood and economic well-being of farming households are closely associated with agricultural productivity and the efficient management of farm resources, while limited awareness, financial constraints and inadequate access to modern agricultural technologies may influence farmers' production and livelihood outcomes (Geetanjali & Singh, 2025). The adoption of modern agricultural technologies has increasingly influenced crop production practices, farm efficiency, and the management of production-related constraints among growers (Ahmad, 2026). Similarly, the application of artificial intelligence and convolutional neural networks in crop disease identification demonstrates the growing role of technology in improving plant health management and potentially reducing production losses (Gulati & Yang, 2026).

A livelihood comprises the capabilities, assets (stores, resources, claims and access) and activities required for a means of living: a livelihood is sustainable which can cope with and recover from stress and shocks, maintain or enhance its capabilities and assets, and provide sustainable livelihood opportunities for the next generation; and which contributes net benefits to other livelihoods at the local and global levels and in the short and long term (Chambers and Conway, 1992). Agriculture remains central to India's economy due to its significant role in providing employment and sustenance for many years. As the population grows rapidly, urbanization becomes unavoidable and widespread. Urbanization refers to the redistribution of population and shifts in the demographic balance between rural and urban areas, resulting in the development and expansion of cities. The growth of urban centers brings about substantial changes in investment, employment opportunities and production patterns within the agricultural economy of the surrounding regions (Kavya, 2013). Hence, it is essential to study the existing profile charecteristics of small farmers and their relationship with livelihood of sub-urban vegetable growers.

2. METHODOLOGY

The present study was carried out in the Pune district of Maharashtra. This district was chosen due to its high levels of urbanization, industrial development and rapid population growth (Census of India, 2011). Haveli tahsil was selected for the study on the basis of level of urbanization. Twelve villages within this tehsil were selected based on their maximum area under vegetable cultivation and production, identified in consultation with the Taluka Agriculture Officer and Agriculture Assistant of that respective area. From each village, 10 sub-urban vegetable growers were chosen by simple random sampling method, resulting in a total sample size of 120 respondents. An ex-post facto research design was adopted for the study. Data collection was done through personal interviews using a pre-tested interview schedule, with most respondents being approached directly in their fields. The collected data was analyzed using statistical tools such as frequency and percentage.

3. RESULTS AND DISCUSSION

The study concluded that the majority of sub-urban vegetable growers were middle-aged (64.17%) and had attained at least secondary education (51.66%). Most operated small land holdings (45.00%) ranging from 1.01 to 2.00 hectares, with 69.17 per cent of sub-urban vegetable growers had low area under vegetable cultivation (i.e. up to 1.60 hectares). A considerable proportion (39.17%) reported a low annual income between Rs. 5,08,001/- and Rs. 8,06,000/-. Market access was relatively favorable, with 44.17 per cent of the growers located within 15 to 24 kilometers of the nearest market. Wells were the primary source of irrigation for 60.83 per cent of growers and 49.17 per cent utilized the flood or surface irrigation method, contributing to a generally fair irrigation status (53.34%). The majority demonstrated a medium level of decision-making ability (42.50%) and risk orientation (45.84%), with 51.67 per cent maintaining moderate contact with extension services.

The study indicated that, the majority (53.33%) of sub-urban vegetable growers possessed a medium level of livelihood. Additionally, 29.17 per cent of the growers reported a low level of livelihood, while only 17.50 per cent achieved a high level of livelihood. These findings suggest that most sub-urban vegetable growers maintain a moderate standard of living, with a considerable proportion still facing challenges in achieving higher livelihood outcomes.

Table 1 Correlation between livelihood and profile characteristics of Sub - urban vegetable growers.

Sr. No	Independent Variables	Correlation coefficient
1	Age	-0.088NS
2	Education	0.273**
3	Land holding	0.631**
4	Area under vegetable cultivation	0.595**
5	Annual income	0.764**
6	Market access	0.035NS
7	Irrigation status	0.413**
8	Decision making ability	0.526**
9	Risk orientation	0.416**
10	Extension contact	0.419**

(** = Significant at 1 per cent level of probability)

(NS= Non-significant.)

It is evident from the Table 1 that there was a negatively significant relationship between age with livelihood of sub-urban vegetable growers (-0.088 NS). This suggests that age may not play a significant role in influencing livelihood. Individuals from any age group can possess the maturity required to make practical decisions and effectively utilize available resources, leading to a moderate level of livelihood development regardless of their age. The findings of present study supported by the findings of Digarse (2021) and Bano (2022). Education was found to have positively significant (0.273**) relationship with the livelihood of sub-urban vegetable growers. A possible explanation for this is that, education fosters behavioural changes and encourages growers to adopt innovative practices, thereby enhancing their livelihood. In essence, education contributes to improved performance and overall livelihood development among vegetable growers. The findings of present study supported by the findings of Rai *et al.* (2019) and Pradhan *et al.* (2021). The correlation coefficient between the livelihood of sub-urban vegetable growers and their land holding was found to be positive and significant (0.631**). This may be attributed to the fact that larger land holdings offer a solid economic foundation, enabling growers to adopt new technologies and innovative practices aimed at maximizing profits. The present finding is in line with the research work of Gajera (2021) and Damilola *et al.* (2022). Area under vegetable cultivation had positive and significant (0.595**) correlation with livelihood. This suggests a meaningful relationship between livelihood and the area dedicated to vegetable cultivation among sub-urban vegetable growers. A possible explanation is that an increase in the proportion of land allocated to vegetable cultivation, relative to total landholding, leads to an improvement in the livelihood of sub-urban vegetable growers.The findings of present study are similar to the findings of Akter *et al.* (2019). Annual income was found to have positively significant (0.764**) relationship with the livelihood of sub-urban vegetable growers. This indicates a strong relationship between annual income and livelihood. A likely reason for this is that higher annual income provides a solid economic foundation, enabling vegetable growers to enhance their standard of living and further improve their income levels. The present finding finds support with the research work of Pradhan *et al.* (2021) and Reddy (2021).

The correlation coefficient between the livelihood of sub-urban vegetable growers and their market access was found to be positive but non-significant (0.035 NS). This indicates that market access does not have a substantial influence on livelihood. A possible explanation for this is that many growers utilize reliable transportation systems (personal or hired) which minimizes the effect of market access on their overall livelihood. Additionally, they tend to sell their produce in markets where they receive better prices, regardless of distance. The findings of present study are similar to the findings of Yizengaw *et al.* (2015) and Punitha (2017). In case of irrigation status , there was a positively significant relationship (0.413**) between irrigation status and livelihood of sub-urban vegetable growers. This indicates a strong relationship between irrigation status and livelihood of sub-urban vegetable growers. A likely reason for this is that adequate irrigation ensures regular and timely

watering of crops, leading to healthier plants, better yields and consistent income, all of which directly contribute to improved livelihood. The findings of present study supported by the findings of Rai *et al.* (2019).

The correlation coefficient between the livelihood of sub-urban vegetable growers and their decision making ability was found to be positive and significant (0.526**). This indicates a meaningful relationship between decision making ability and livelihood. A possible explanation for this is that high decision making ability enables sub-urban vegetable growers to efficiently manage resources, adopt innovations, mitigate risks and make informed choices that enhance livelihood. The present finding is in line with the research work of Kori (2019). A positively significant relationship (0.416**) was observed between risk orientation and livelihood of sub-urban vegetable growers. Risk orientation and the livelihood of sub-urban vegetable growers are positively and significantly correlated because growers who are willing to take calculated risks are more likely to adopt new technologies, diversify crops, explore innovative marketing strategies and seize income generating opportunities that enhance their livelihood. The findings of present study supported by the findings of Digarse (2021) and Pradhan *et al.* (2021). Similarly the relationship between extension contact and livelihood of sub-urban vegetable growers was found to be positively significant (0.419**). A possible explanation for this is that regular interaction with extension services provides vegetable growers with timely information, improved practices and access to resources, all of which contribute significantly to enhancing their livelihood. The present finding is conformity with the finding of Ramya *et al.* (2017) and Pradhan *et al.* (2021).

4. CONCLUSION

The study inferred that the majority of respondents belonged to the middle-age group. A large proportion of sub-urban vegetable growers had attained secondary education, indicating a moderate educational background. Most of the growers were found to have small-sized land holdings, typically ranging between 1.01 to 2.00 hectares. The majority cultivated vegetables on a relatively low area, generally up to 1.60 hectares. In terms of income, a significant number of growers were categorized under the lower annual income bracket. Regarding market access, most of the sub-urban vegetable growers were located at a considerable distance from markets, typically between 15 to 24 kilometers. Wells served as the primary source of irrigation for most of the vegetable growers, and the flood or surface method was the most commonly used irrigation technique. The overall irrigation status of the respondents was generally fair. Additionally, the majority of sub-urban vegetable growers demonstrated a medium level of decision-making ability, risk orientation, and extension contact, reflecting a moderate engagement in agricultural decision-making and advisory services.

The findings of this study on the correlation between livelihood and profile characteristics of sub-urban vegetable growers revealed that among the independent variables namely education, land holding, area under vegetable cultivation, annual income, irrigation status, decision-making ability, risk orientation, and extension contact each showed a positive and significant relationship with their livelihood. In contrast, age exhibited a negative and non-significant relationship with livelihood, while market access demonstrated a positive but non-significant relationship. In conclusion, the study underscores the significant influence of socio-economic and psychological factors on the livelihood of sub-urban vegetable growers. To improve their overall livelihood, efforts should focus on enhancing access to education, expanding irrigation infrastructure, promoting advanced farming practices and strengthening extension services. Additionally, improving market linkages and encouraging younger participation in vegetable farming can contribute to more sustainable and secure livelihoods for these growers.

REFERENCES

[1] Ahmad S. (2026). Smart Farming with Deep Learning: Effective Soybean Leaf Disease Diagnosis via InceptionV3. Bulletin of Pure and Applied Sciences-Botany, 45B (2), 31-40. https://bpasjournals.com/botany/index.php/journal/article/view/178/154

[2] Akter, A., Ahmad, N., Bagum, T., Islam, M.M., Rahma, M.M., and Hossain, M.I. 2019. The impact of traditional homestead vegetable cultivation on the improvement of livelihood of rural women in Bangladesh. Asian Journal of Agriculture and Rural Development, 9(2): 242–254. https://doi.org/10.18488/journal.1005/2019.9.2/1005.2.242.254.

[3] Bano Naaz. 2022. Comparative study on conventional and integrated farming systems for livelihood security of small and marginal farm families. Ph.D. Thesis, CCS Haryana Agricultural University Hisar - 125004 (Haryana).

[4] Census of India. 2011. Available at http://www.censusindia.net.

[5] Chambers, R. and Conway, G. 1992. Sustainable Rural Livelihoods: Practical Concepts for the 21st Century. Institute of Development Studies Discussion Paper no. 296. Institute of Development Studies, University of Sussex: Brighton, UK.

[6] Damilola, T. A., Dorcas, T.F., Rahmat, O.O., and Lydia, O. 2022. Socio-Economic Factors Influencing Livelihood Diversification Among Rural Farming Households In Southwest Nigeria: A Fractional Response Model Approach. Scientific Papers Series Management, Economic Engineering in Agriculture and Rural Development Vol. 22, Issue 4.

[7] Digarse Upasna. 2021. Determinants of livelihood security of small and marginal farmers in Rewa block of Rewa District (M.P.). M.Sc. (Agri.) Thesis, Jawaharlal Nehru Krishi Vishwa Vidyalaya, Jabalpur.

[8] Food and Agriculture Organization. 2015. Urban And Peri-Urban Agriculture. https://www.fao.org.

[9] Gaikwad, M. 2022. Dynamics of Urban Sprawl In The Peri-Urban Area of Pune, India. In Indira College of Architecture, Pune. Journal of The Indian Institute of Architects. (Vol. 22): 1-9.

[10] Gajera, D. S. 2021. Assessment of Livelihood Security of Farmers In Coastal Area Of Saurashtra Region. M.Sc. (Agri.), Thesis. Junagadh Agricultural University.

[11] Geetanjali, & Singh, A. R. (2025). Precision and smart farming: An approach to efficient resource management in agriculture. *Journal of Artificial Intelligence in Agriculture and Applied Research, 1*(1), 25–33. https://agrpjournals.com/journals/journal/index.php/jaiaar/article/view/6/5

[12] Gogoi, K. 2022. Suburban Development In India: An Emerging Area of Concern. International Journal of Multidisciplinary Educational Research. ISSN:2277-7881; Impact Factor :7.816(2022); IC value:5.16; ISI value:2.286.

[13] Gulati K. (2026). AI and Machine Learning in Animal Disease Detection: Benefits, Labor Reduction, and Ethical Considerations. Bio-Science Research Bulletin, 42(1), 42-55. https://bpasjournals.com/life-sciences/index.php/journal/article/view/160/145

[14] Kantakumar, L. N., Kumar, S., Schneider, K. 2015. Spatiotemporal urban expansion in Pune metropolis, India using remote sensing. Habitat International 51 (2016) 11-22.

[15] Kavya, C. 2013. Impact of Peri-Urban On Agriculture In Karnataka: A Socio Economic Analysis. Department Of Agricultural Marketing, Co-Operation And Business Management University Of Agricultural Sciences Bengaluru – 560 065. M.Sc. (Agri) Thesis.

[16] Kori, R. 2019. Assessment of Sustainable Livelihood System among Small and Marginal Farmers in Rewa District of M.P. Jawaharlal Nehru Krishi Vishwa Vidyalaya Jabalpur. M.Sc. (Agri) Thesis.

[17] Nandini, C. L. 2018. Impact of urbanization on agricultural production system across rural-urban interface of North Bengaluru. Green Farming. M.Sc. (Agri) Thesis.Vol. 9 (6).

[18] Oxford English Dictionary. 2011. 555-556. https://www.oed.com.

[19] Pradhan, S., Naberia, S., Harikrishna, Y. V., and Jallaraph, V. 2021. Socio-Economic Correlates of Livelihood Security of Small Farmers in Jabalpur District of Madhya Pradesh. Indian Journal of Extension Education, 57(3), 57 59.

[20] Punitha P. 2017. Jhumias of Manipur in North-East India : A Livelihood Analysis. Ph.D. (Agricultural Extension) Thesis. Central Agricultural University, Imphal.

[21] Rai, M. K., Paudel, B., Zhang, Y., Khanal, N. R., Nepal, P. and Koirala, H. L. 2019. Vegetable Farming and Farmers' Livelihood: Insights from Kathmandu Valley, Nepal. Sustainability 2019, 11, 889.

[22] Ramya, H. R., Satya Gopal, P. V., Prasad, S. V. and Raja, L. 2017. Characteristics determining the livelihood security of

the tribal farmers. International Journal of Current Microbiology and Applied Sciences. 6(7): 4462-4470.

[23] Reddy Venkata. 2021. Livelihood analysis of agricultural labourers in Andhra Pradesh. Ph.D. thesis, Acharya N.G. Ranga Agricultural University Guntur – 522 034. A.P.

[24] Schiavina, M., Freire, S., MacManus, K. 2022. GHS Population Grid Multitemporal (1975–2030). 2022. https://ghsl.jrc.ec.europa.eu/datasets.phpinline-nav-ghs_pop2022.

[25] Yizengaw, Y. S., Okoyo, E. N. and Beyene, F. 2015. Determinants of livelihood diversification strategies: The case of small holder rural farm households Debre Elias Woreda, East Gojjam Zone, Ethiopia. African J. Agril. Res. 10(19): 1998-2013.