Eco. Env. & Cons. 26 (November Suppl. Issue) : 2020; pp. (S104-S108)
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ISSN 0971–765X

Nutrition-based benefits of Kitchen Gardens: An investigation of gender differences

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(Received 10 March, 2020; Accepted 29 April, 2020)

ABSTRACT

Food remains the primary concern of human society.Kitchen gardens have been an important vehicle of food availability and food-security across time and geography. Sikkim, a small Himalayan State in India also has a rich tradition of kitchen gardens. How do rural people of Sikkim view their kitchen gardens in this respect? Are there any gender differences in rating various nutrition based benefits of kitchen gardens? This research work has been undertaken to understand the views of rural people of Sikkim with respect to the significance they attach to their kitchen gardens as a medium for providing food, food security, reliable food source, and food-diversity and as a bulwark against famine. It is concluded that kitchen gardens are held high in the context of food-security and food availability. It is also seen that there are gender differences in this respect with women displaying a greater importance for kitchen gardens. The paper infers that women are more concerned with food crisis and hence kitchen gardens may be promoted as women-centric and women-driven initiatives.

Key-terms: *Sikkim, Kitchen gardens, Food-security, Food diversity, Famine, Gender-differences*

Introduction

Food is one of the most fundamental human requirement. It is not just the quantity but the quality also that determines the usefulness of a meal. A balanced food has been always high on human agenda and Sikkim is not an exception. Are we able to provide balanced food to our people? In the context of India, the answer unfortunately is a resounding "No". Millions in India go hungry every day and millions, probably more than a billion, suffer from malnutrition. Meeting nutritional needs of growing population is a severe challenge, though still a collective responsibility. Dependence on Government is constitutionally valid but suicidal in practice. Self-sufficiency is the call of the times. Each of us has to play a role in food production. Growing food in all the available space, including the kitchen gardens is now a necessity and not just an option. The nutritional benefits we studied during the study are as follows:

Importance of nutritional food is known to human community for time immemorial. Even today a lot of studies have been conducted on the issue. A large number of deficiency disease can be eliminated simply by fortifying kitchen gardens. Is there an evidence that kitchen gardens improve nutritional levels? It is reported that in rural Puerto Rico the presence of a kitchen garden was found to be a strong predictor of child nutritional status (Immink

et al., 1991). Tarwotjo *et al.* (1982) found that consumption of dark-green leafy vegetables (available in kitchen gardens) was correlated with a lower incidence of corneal disease in Indonesia (Tarwotjo *et al.,* 1982). In another study it is reported that Food-based nutrition interventions, including kitchen gardens and nutrition education, offer a potentially sustainable approach to reducing multiple nutritional deficiencies (Jones *et al.,* 2005). The same study concluded that an approach to supplementation is to increase consumption of micronutrient-rich foods by establishing household kitchen gardens. The evidence, therefore is more than obvious. Nutritional levels can be improved through kitchen gardens.

Improved intake of fruits and vegetables results in a noticeable reduction in occurrence of several diseases including cardiovascular diseases, cancer and type 2 diabetes (Heber, D., Bowerman, 2001; Jamison, 2003; Perrin *et al.,* 2002; Somerset *et al.,* 2005; Stables *et al.,* 2002).

Kitchen garden refers to a garden in which plants (such as vegetables, fruits or herbs) for use in the kitchen are grown. These have been an important familial and social entities throughout human history. Their food and nutrition based benefits have been known widely. How do rural people of Sikkim view their kitchen gardens in this respect? Are there any gender differences in rating various nutrition based benefits of kitchen gardens? This study is focused upon exploring the gender based views on nutrition-based benefits of kitchen gardens in the state of Sikkim.

Methodology

The studyis evidence-based. A survey was undertaken of the kitchen-gardens across the state of Sikkim. In all 67 kitchen gardens were visited. The first part of the survey comprised of open questions regarding significance of kitchen-gardens for their owners particularly in the context of Food-availability, Food-security, Food for Family; Food diversity and as a bulwark against famine. Later they were presented with an interview schedule for rating five nutritional aspects (on a 10-point continuous scale) of kitchen gardens. Gender-based differences of expressed belief have been identified. In the second part of the study we have also conducted independent t-test to test if significant gender differences exist in evaluating the significance of kitchen gardens vis-à-vis food and nutrition-based benefits. Hypothesis has been tested at 95% confidence limit and t-vaues more than 1.96 signify significant difference. p-values below 0.001 are taken as zero.

Results and Discussion

In this subsection information obtained from kitchen garden owners have been discussed and which is as follows.

Food availability: Respondents state that availability of food is of paramount importance to the. Lack of food can quickly reduce individuals, families and communities to starvation and then death. This observation finds reverberation in available literature. Approximately two million people died during great Bengal famine of 1940s (Padmanabhan, 1973). They died *in the struggle to live through the few intervening weeks that separated them from the harvest* (Goswami, 1990). Its memories cannot be washed away and we must be ready as a state and nation to avoid such an occurrence.

The array of benefits listed by the respondents has been provided hereunder:

Food-security: Food-security is one of the most vital aspect of human community today. To the rural people of Sikkim, foof-security is linked to kitchen gardens. This because in recent times the corporate food economy has resulted in thee increased separation of people from the sources of their food and nutrition (Levkoe, 2006). Kitchen gardens have the potential to sustainably improve nutrition and food security (Wilcox *et al.,* 2015). A number od studies has explored this linkage between kitchen gardens and food security. If and when there are gaps in food availability a kitchen garden ensures that at least a little is available to eat for a family. A kitchen garden, therefore is a dependable buffer between gaps in food availability (Mohsin *et al.,* 2017; Gupta, and Mehta, 2017; Arya *et al.,* 2018; Uckert *et al.,* 2018).

It provides food for the family: Daily feeding a family appears to be the most fundamental task for a family, as mentioned by the respondents also. Day to day feeding of a house-hold remains critical. Kitchen gardens play an important role in this by bridging gaps in availability of a few items. During heavy rains it is noticed that villages in Sikkim are cut-off from main markets. During such times with store of a few items such as rice and flour and a sup-

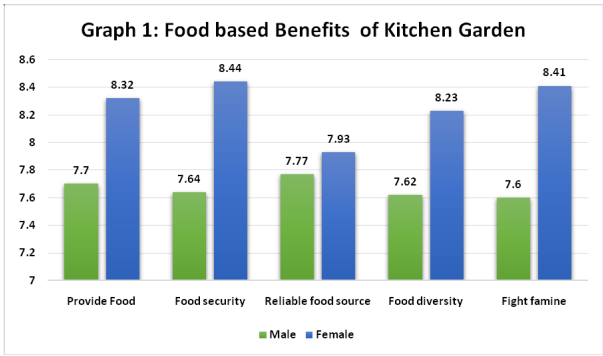
ply from kitchen gardens ensure that a reasonable meal is served on regular basis.

Kitchen gardens promote food diversity: Diversity of food is a fundamental nutritional principle.Also a diverse food-base running across seasons ensures that food remains available**.** Respondents reported thatfood diversity has been a recognized measure for health and nutrition. The effort of government agencies therefore has been to enhance food diversity for its people. Unfortunately the recent trends whereby people are more or less divorced with food production, less variety of food is being consumed. Guitart *et al.* (2014) report that fewer fruits and vegetables are being eaten in Australia than is suggested by health practitioners (Guitart *et al.,* 2019). As per a 2007 state study 78% of Australian children aged 4-8 years and 86% aged 9-13 do not eat enough vegetables they are recommended to eat. Kitchen gardens are being advocated to counter some of these trends (Block *et al.,* 2012). Research on community gardens has demonstrated clear linkages between gardening, improved levels of physical activity, and better nutrition (Armstrong, 2000; Harris, 2009; Kingsley *et al.,* 2009; Teig *et al.,* 2009; Wakefield, *et al.,* 2007).

In food crisis kitchen gardens could be a bulwark against famine: Respondents narrate how in near and far away past they and their ancestors suffered from famine and how well they have been served by kitchen gardens. Mass deaths because of famine are not an uncommon phenomenon. The world over incidents of famine are narrated as historical facts or as folklores. India in particular has its large share of such experiences. The famine of 1943 is said to have resulted in death of approximately two million people. It is to be understood that they died *in the struggle to live through the few intervening weeks that separated them from the harvest* (Goswami, 1990). In other words a buffer of a couple of weeks could have saved them. There could have been some ways to achieve them, but one important factor could have been practice of having robust kitchen gardens. As recently as the food production in modern India fell by 19% in 1965-67. The then agriculture minister of India Mr, C. Subramaniam, made an appeal to the people of India to grow food wherever they can. There was a positive response to his request and India could tide over the crisis without much human loss. We have already discussed earlier about the experience in erstwhile Soviet socialist Republic 1n 1991. After the break of this super power and death of communism in this region there was an upheaval and agriculture became a victim. People survived because of kitchen gardens – particularly their faith in producing potatoes (Ries 2009). These examples more than confirm how important a role kitchen gardens can play as a bulwark against famine. In a hypothetical scenario if a country like India has zero petrol/diesel for just a couple of weeks, the entire transport system may come to a stand-still and food distribution will be crippled, resulting in death of millions of people. What happens in a remotely located state like Sikkim? They will survive if a resilient and a reliant kitchen garden culture exists. Developing a local food-web in urban dwellings has also be suggested by Chen, (2012).

Gender differences: Graph 4.3 displays the scoring of importance of food-based benefits of kitchen gardens. This is the highest scoring factor as we have discussed earlier. It is important to note that Food security, food diversity and famine-resistance are rated highest by the respondents specifically women.

From Graph-1 we find that food-based benefits of kitchen gardens are rated very high. On a scale of 10 point values range from 7.6 to 8.44. This high rating stems from a historical understanding of kitchen gardens. In an era when dependence on Governments has been promoted indiscriminately and individual responsibility and resilience is reduced substantially, it makes sense to focus on kitchen gardens once again.



From the graph it is apparent that women consistently rate kitchen garden much higher than the men in terms of providing food, food security, reliable food source, and food-diversity and as a bulwark against famine. This could be because (a)

Table 1. Independent t-test (Gender difference

Gender		Mean	Std. Deviation	t-value	p-value
Provide food	Male	7.72	1.17	3.22	0.002
	Female	8.31	1.03		
Food security	Male	7.64	1.19	4.21	0
	Female	8.43	0.97		
Food Reliability	Male	7.72	1.13	1.09	0.277
	Female	7.93	1.08		
Food Diversity	Male	7.63	1.21	3.05	0.003
	Female	8.24	1.13		
Fight famine	Male	7.60	1.19	4.36	0
	Female	8.42	0.93		

Women are primarily concerned with provision of food to the family members, especially their children and (b) kitchen-gardens are predominantly women-centric. Implications of this understanding is that policy-makers and NGOs must involve women in framing food-based polices. From the graph we find that food-security is the most important concern of women. This implies that policy-makers must come up with appropriate policies for building food-security component in kitchen gardens across the state. Gender difference are more pronounced in terms of food-security and fighting famines. Women as we know, are more future concerned, particularly with respect to negative possibilities. Also women suffer more in case of famine (Mu and Zhang, 2011).

Table 1 summarizes the result of independent t-test to determine if significant gender difference exist in evaluating the food and nutrition-based role of kitchen gardens at Sikkim. As already mentioned t-values above 1.96 and corresponding p-values below 0.05 indicated significant differences. We find food reliability is the only variable where gender differences are not significant. It other respects (namely providing food, Food security, Food diversity and fighting famine we find significant, though low gender differences exist with women consistently rating kitchen gardens at higher values. What could be the reason for this gender difference? Women, specifically in the rural regions of Sikkim, are mainly responsible for providing food to the family and hence kitchen gardens assumes a far greater significance for them. Its nearness also makes it a preferred option, particularly in times of difficulties. Implications of this understanding is that women should be allowed to play a greater role in managing kitchen gardens. Policy-makers must utilize this centrality of kitchen gardens for women by seeking their ideas and information on one hand and include them in training programmes to improve the kitchen garden prospects in the state.

At the end it may be summarized that kitchen gardens could play a vital role in ensuring food-security and in fighting famine. Also women are more concerned with food crisis and hence kitchen gardens may be promoted as women-centric and women-driven initiatives.

References

Armstrong, D. 2000. A survey of community gardens in upstate New York: implications for health promotion and community development. *Health and Place.* 6 : 319-327.

Arya, S., Prakash, S., Joshi, S., Tripathi, K. M. and Singh, V. 2018. Household Food Security through Kitchen Gardening in Rural Areas of Western Uttar Pradesh, India. *Int. J. Curr. Microbiol. App. Sci*. 7(2): 468-474.

Block, K., Gibbs, L., Staiger, P.K., Gold, L., Johnson, B., Macfarlane, S., Long, C. and Townsend, M. 2012. Growing community: the Impact of the Stephanie Alexander Kitchen Garden Program on the social and learning environment in primary schools. *Health Education and Behavior.* 39 : 419-432.

Chen, S. 2012. Civic agriculture: towards a local food web for sustainable urban development. *APCBEE Procedia*. 1 : 169-176.

Goswami, O. 1990. The Bengal famine of 1943: re-examining the data. *The Indian Economic & Social History Review*. 27(4) : 445-463.

Guitart, D. A., Pickering, C. M. and Byrne, J. A. 2014. Color me healthy: Food diversity in school community gardens in two rapidly urbanising Australian cities. *Health & Place*. 26 : 110-117.

Gupta, G. and Mehta, P. 2017. Roof Top Farming a Solution to Food Security and Climate Change Adaptation for Cities. In *Climate Change Research at Univer-*

sities (pp. 19-35). Springer, Cham.

Harris, E. 2009. The role of community gardens in creating healthy communities. *Australian Planner*. 46 (2): 24-27.

Heber, D. and Bowerman, S. 2001. Applying science to changing dietary patterns. *The Journal of Nutrition* 131: 3078S-3081S.

Ibrahim, N., Honein-AbouHaidar, G. and Jomaa, L. 2019. Perceived impact of community kitchens on the food security of Syrian refugees and kitchen workers in Lebanon: Qualitative evidence in a displacement context. *PloS One*. 14(1) : e0210814.

Immink, M.D.C., Sanjur, D. and Colon, M. 1991. Home gardens and the energy and nutrient intakes of women and preschoolers in rural Puerto Rico. *Ecol Food Nutr*. 11 : 191–199.

Jamison, J.R. 2003. Dietary diversity: a case study of fruit and vegetable consumption by chiropractic patients. *Journal of Manipulative and Physiological Therapeutics* 26 : 383-389.

Jones, K. M., Specio, S. E., Shrestha, P., Brown, K. H. and Allen, L. H. 2005. Nutrition knowledge and practices, and consumption of vitamin A–rich plants by rural Nepali participants and nonparticipants in a kitchen-garden program. *Food and Nutrition Bulletin*. 26(2): 198-208.

Kingsley, J., Townsend, M. and Henderson-Wilson, C. 2009. Cultivating health and wellbeing: members' perceptions of the health benefits of a Port Melbourne community garden. *Leisure Studies*. 28: 207-219.

Levkoe, C. Z. 2006. Learning democracy through food justice movements. *Agriculture and Human Values*. 23(1): 89-98.

Mohsin, M., Anwar, M. M., Jamal, F., Ajmal, F. and Breuste, J. 2017. Assessing the role and effectiveness of kitchen gardening toward food security in Punjab, Pakistan: a case of district Bahawalpur. *International Journal of Urban Sustainable Development*. 9(1) : 64-78.

Mu, R. and Zhang, X. 2011. Why does the Great Chinese Famine affect the male and female survivors differently? Mortality selection versus son preference. *Economics & Human Biology*. 9(1) : 92-105.

Padmanabhan, S. Y. 1973. The great Bengal famine. *Annual Review of Phytopathology*. 11 (1) : 11-24.

Perrin, A., Simon, C., Hedelin, G., Arveiler, D., Schaffer, P. and Schlienger, J. 2002. Ten-year trends of dietary intake in a middle-aged French population: relationship with educational level. *European Journal of Clinical Nutrition*. 56 : 393-401.

Ries, N. 2009. Potato ontology: surviving postsocialism in Russia. *Cultural Anthropology*. 24(2) : 181-212.

Somerset, S., Ball, R., Flett, M. and Geissman, R. 2005. School-based community gardens: reestablishing healthy relationships with food. *Journal of the Home Economics Institute of Australia*. 12 : 25-33.

Stables, G., Subar, A., Patterson, B., Dodd, K., Heimendinger, J., Van, D., Anns, M. and Nebeling, L. 2002. Changes in vegetable and fruit consumption and awareness among US adults: results of the 1991 and 1997 5-a-day for better health program surveys. *Journal of the American Dietetic Association*. 102 : 809-817.

Tarwotjo, I., Sommer, A., Soegiharto, T., Susanto, D. and Muhilal. 1982. Dietary practices and xerophthalmia among Indonesian children. *Am J ClinNutr*. 35 : 574–581.

Teig, E., Amulya, J., Bardwell, L., Buchenau, M., Marshall, J. and Jill, S. 2009. Collective efficacy in Denver, Colorado: Strengthening neighbourhoods and health through community gardens. *Health and Place* 15 : 1115-1122.

Uckert, G., Graef, F., Faße, A., Herrmann, L., Hoffmann, H., Kahimba, F. C. and Makoko, B. 2018. Scal A-FS: expert-based ex-ante assessments of local requirements and success potential of upgrading strategies for improving food security in rural Tanzania. *Food Security*. 10(4) : 841-858.

Wakefield, S., Yeudall, F., Taron, C., Reynolds, J. and Skinner, A. 2007. Growing urban health: Community gardening in South-East Toronto. *Health Promotion International.* 22 : 92-101.

Wilcox, C. S., Grutzmacher, S., Ramsing, R., Rockler, A., Balch, C., Safi, M. and Hanson, J. 2015. From the field: Empowering women to improve family food security in Afghanistan. *Renewable Agriculture and Food Systems*. 30(1) : 15-21.