

The role of agrobiodiversity in local food systems and diets

A Case Study from Vietnam

Raneri JE*^{1,2}, Kennedy G¹, Lachat C²

1. Bioversity International, Maccaresse, Italy

2. Ghent University, Ghent, Belgium

* Corresponding Author j.raneri@cigar.org

Introduction

The critical role of biodiversity as a component of sustainable food systems that contributes to healthier diets is a concept that is steadily gaining attention on the global research and development agenda (Bereuter and Glickman, 2015). The regions of the world with the richest biodiversity are found in developing countries where most of the world's poor and malnourished reside.

The development of the global agriculture and food system has also been accompanied by a decline in the diversity of foods produced (Khoury et al., 2014), with farming practices shifting away from small scale diverse systems, towards more large scale, monoculture systems (IPES-Food, 2016).

The observed trends in poor diet quality pave the road for future solutions and systems that are more sustainable, resilient and equitable.

Innovative approaches are required that can simultaneously improve human nutrition, landscape health and ecosystem services within a landscape. Promoting and mainstreaming the use of biodiversity in food systems has the potential to be one of these solutions.

Method

A sample of 416 households was randomly selected from Mai Son, North West Vietnam. Criteria of selection were women of reproductive age with a child aged between 12-24 months.

Questionnaires were administered to:

- heads of household on the family's agrobiodiversity production in commercial and homegarden systems (including wild foods)
- women of reproductive age on nutrition (including a repeated quantitative 24 hour diet recall for mothers and young children, and nutrition related knowledge and attitudes).

A market survey was also conducted from formal and informal retail outlets within the research site to document:

- available diversity
- accessibility (cost) of diverse and nutritious foods

Role of Agrobiodiversity per food group in different food system dimensions

Food Group	Species Count	% of Total Production Diversity	% Total Market Diversity	% consumed*		% Total Market Diversity
				Children	Women	
Cereals/Grains	5	1	10	100	100	10
White roots and tubers	10	3	1	100	100	1
Vitamin A-rich vegetables and tubers	2	1	1	72	34	1
Dark green leafy vegetables	22	6	4	29	12	4
Other vegetables	102	26	10	85	42	10
Vitamin A-rich fruit	12	3	1	3	4	1
Other fruit	60	15	5	32	31	5
Flesh foods	66	17	16	78	73	16
Dairy	**	**	4			4
Fish and other aquatic	40	10	10	47	38	10
Nuts and seeds	3	1	1	3	2	1
Legumes	11	3	3	17	16	3
Spice, condiments, beverages	21	5	15	100	100	15
Not edible	44	11				
Total	398	100	81 [▲]			

*Average across 2 seasons ** Counted under flesh foods ▲ 9% remaining market diversity came from items not categorized in presented food groups including sweets and fats and oils

Results

In total, 398 different species were documented as produced on-farm or collected from the wild (292 plants, 106 animals).

Whilst there was wide production diversity at landscape level evidenced from the high species richness, this production diversity was not evenly distributed across the different food groups used to categories a diverse diet.

The diet recall showed only 59% of women met Minimum Diet Diversity (MDD).

Food groups with low consumption (defined as food groups that were consumed by less than 26% of women or children) were legumes, nuts and seeds, dairy, dark green leafy vegetables and vitamin A-rich vegetables and fruit.

Species from these food groups also represented a low percent of total production (13%) and market (8%) diversity, calculated for each food group by summing the number of species produced or available in the market from

each of these food groups divided by the total number of species produced, or available in the market.

Food groups with high consumption (food groups consumed by more than >40% of women or children) were meat, fish, and other fruits and vegetables.

Subsequently these groups represented a higher percent of production (67%) and market (45%) diversity.

Women and children who reached MDD were up to 44% more likely to have consumed legumes, nuts and seeds, dairy, dark green leafy vegetables and vitamin A-rich vegetables and fruit compared to those who did not reach MDD.

Analysis of the data from the nutrition knowledge and attitudes questionnaire identified that only 18% of women felt that diet diversity was important to prevent undernutrition.

Interpretation

These data suggest a positive correlation between species richness of food groups (the number of different species within a single food group) in local production and market systems and their subsequent consumption.

Approaches that promote the availability of nutritious and agrobiodiverse foods from under consumed food groups, particularly local species of fruits, dark green leafy vegetables, legumes, nuts and seeds, may increase the percent of women and children who reach MDD.

Conclusion

Local agrobiodiversity can contribute to diverse and healthy diets. However, increasing the availability of nutritious and diverse foods is often alone insufficient to increase their consumption.

Complementary implementation of nutrition capacity building aimed at improving attitudes towards the importance of diverse diets is also needed.

Further research is recommended to understand how these combined efforts can impact landscape agrobiodiversity and MDD.