



Potential of minor cucurbits for sustainability and livelihood support in west Bengal

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Abstract: Cucurbitaceae is the family of melons and gourds. It has contributed the world with a pack of diverse commodities and in particular, it has been a source of traditional food and medicine both to the native and rural folks. India is endowed with myriad genetic variability of cucurbits, comprising of 34 genera and 108 species of which 38 species are endemic. Many cucurbits have their centres of diversity in this country. In this eastern state of India (i.e. West Bengal), huge variability is present in cucurbits as a whole. Minor cucurbits like snap melon, chow-chow, snake gourd, ivy gourd, wax gourd, sponge gourd, ridge gourd, musk melon, sweet melon, spine gourd etc, though underutilized, can hardly be called 'minor' in the daily life of the rural poor. The cucurbits along with other groups of underexploited and traditional vegetables play a significant role in the household food and nutritional security (particularly through vitamin and mineral supplementations) and income generation of the small and marginal farmers and landless labourers. These features uniquely augment livelihood options for the poorest segment of a community with respect to working assets and capabilities to earn a living. Homestead gardens are natural assets suitable for addressing such livelihood support objectives along with some other issues like gender equality and *in situ* sustainable conservation of diverse plant genetic resources. The ever-narrowing base of crop variability has an impact on global food security and actually encroaches upon the access of the rural people to the available natural resources and social logistics like land, water, credit and other infrastructural facilities, market links, institutional supports etc. For a sustainable supplementary food production system in marginal lands, the local minor cucurbits are well suited for they are tailored to – a) withstand both biotic and abiotic stresses, b) ensure more crop capacity per unit area, c) grow with low cost inputs. This paper explores the diversity and potential of cucurbits, with special reference to minor ones for nutritional and income support in rural Bengal. Interventions through technical information sharing, participatory developmental approaches and credit options are a must for the awareness, nutritional and income security of the distressed people, especially women vis-a vis biodiversity conservation.

Key words:

Introduction

The present paper firmly envisages the need of technology-socialization process for transforming horticulture into an amenable means and available opportunity to eke out livelihood, to secure nutrition and to sustain a descent life style. This being the million dollar question, the poorest of the poor in countries like India, Sri Lanka, Bangladesh, Nepal, Pakistan, Bhutan must come to serious consideration and befitting interventions. Poverty is increasing in these countries, the nature of which is nutritional, economic, informational, educational and in the form of cultural erosions.

Planning for scant resources and squeezing land: man ratio have compelled the technology generators to ponder over hitherto unknown and untapped scopes to tune with human imagination and capabilities. The minor vegetables are not only genetically carry-forwarded but also traditionally transcended along and across the spatial and cultural distribution.

The objective of the present study are delineated hereunder-

1. To view the concept from socio-technological and eco-nutritional perspectives.
2. To build up a synergy amongst and between livelihood, income and nutritional potentials of cucurbits by taking homestead plots as the core resource endowment.
3. To derive some strategic implication from such synergy to make an alternative plan for sustaining the poor.
4. To make some referral studies in making the entire concept logically enduring and operationally befitting.

Sustainable livelihood

A sustainable livelihood is a sum total of capabilities, assets and activities required for a means of living which can cope with and recover from stresses & disruptions and keeps up capabilities and assets without undermining the natural resource base (Carney, 1998). A livelihood support programme should have down-to-earth focus on sustainability and elevating the standard of living of the poor. In principle, it should put emphasis on combating hidden hunger and protein energy deficiency, equitable access to land, finance, market links, health and sanitation, quality education, information and capacity building. The present day production system should aim at food security in macro-sense to nutritional security at the individual level.

Poverty-Nutrition Linkage:

Poverty is a man made reality. Hunger persists in the midst of plenty. In India rapid population growth, low agricultural productivity, small or ultra-small landholdings even landlessness, low literacy rates (especially among women), lack of employment opportunity and unstable public distribution system amalgamate together to give rise to rural poverty. A World Bank report (1997) shows that the greatest predictor of poverty in India is, by far, landlessness and 68% of the landless wage earners are poor.

Indian Planning Commission designates poverty line as-

<2400 K calorie average intake in rural areas per day / adult

<2100 K calorie average intake in urban areas per day / adult

+ 1 USD income / day with lowest expenditure on goods and services

Regional prices, food habit and supply of food do vary; that's why drawing a common national poverty line may lead to under or over estimation of poverty; so state specific price relatives are considered for overall poverty estimation. In rural West Bengal, calorie consumption in poverty-line class is slightly over 1900 per day, which is about 80% of the normal daily requirements; people have to spend 70% of their total expenditure for food and the figure is higher than the Indian average (approximately 65%). It is not still clear, though people have to spend an above national-average cost per calorie, whether the poverty-line class is consuming a nutritionally superior food than earlier or not (Sen, 2007).

India has the highest child undernourishment in terms of weight for age and other anthropometric criteria. The removal of poverty demands combination of health initiatives, nutrition intervention and creation of extra income (Sen, 2005). With different poverty alleviation endeavours, rural poverty in India, during the last three decades of the last century has gone down from 56.4% in 1973 to 27.1% in 2000; there has been a significant reduction in percent severity of undernourished pre-school children too (Nayyar, 2007). Everyone, right from the poor to the elites, needs a balanced diet comprised of carbohydrate, fat, protein, vitamins, minerals and adequate quantity of water to maintain a good physical and mental health and

satisfactory working capacity. Fruits and vegetables together play a crucial role in nutritional security. One needs to eat a combination of different types and varieties on a regular basis. For rural poor, homestead plots are potent sources of steady supply of such nutrition-rich foods. Per capita availability of vegetables in India, at present are 125 – 130 gm /day /head and 70% of vegetable produce is consumed by the middle and high income section of the urban and peri-urban population (Attavar, 2000). The affluent section adolescents are increasingly becoming an easy prey of obesity as a result of lifestyle attitude.

The poor cannot afford fruits and vegetables from markets. Cucurbits in home gardens offer an excellent scope of easy access and consumption; they are the most dominant species in backyard gardens of Bengal. Traditionally, Indian agriculture has been comprised largely of women labour force, majority of who hail from landless, poor, illiterate and backward segments of the society. About 60-70% of the agricultural work force in India is women; they also are the mainstay of homestead plots; so, their malnutrition and caloric deficit on a daily basis ought to affect productivity. In a study by Mallick and Acharya (2004) at *Haringhata* block, Nadia, West Bengal, India, it was found that girl & boy children of 6 – 11 age group (primary school going) are suffering from 600 – 700 and 300 – 400 K calorie deficit everyday, respectively, irrespective of economic class.

And more so, women get trace nutrition. Down the consumption ladder, women eat last and the least (Table 1).

Table 1: Social attitude towards food consumption in rural West Bengal

Normal situation (Food is plenty)	Crisis situation (Food is scarce)
Male (family head)	Children (no gender discrimination)
Children (boy)	Male
Children (girl)	Female
Adult women	-

(Source: Das, 2001)

Homestead garden – the emerging choice of sustainable food production system

Homestead plots have the potential to enhance nutritional, economic security and can back a family during hardships. Now, it is accepted globally that the homestead production system is a low-cost, low-risk venture to improve food and fuel availability and to secure enriched diverse diet. In the present study, it has been found that small to large (1000 – 3000 sq ft) plots of homestead and surrounding vacant spaces like rail and road sides, border areas of crop fields and water bodies or pots of varied sizes are fit enough to produce minor cucurbits with locally available planting

materials, manures, live fences and eco-friendly indigenous pest management practices.

With the rise in population influx and rapid urbanization the per capita land availability in India is squeezing everyday. The homestead agri-space, the most enduring form of family food production system with optimal use of resources, has come up as the most important choice for enterprise building as a result of hunt for new options for land resources. Other than being a basic source of wealth formation to poor households and providing nutrition, livelihood and stability against economic and social entropy, it also generates income for women by selling of excess produce and extends consumption periods by value

addition to excess food through indigenous preservation and processing methods.

West Bengal has achieved a great success in re-distributing land assets through tenancy reforms (*Operation Barga*) to the rural poor and approximately 500,000 rural families have received homestead plots (Hanstad and Brown, 2001). But at the same time, in terms of ceiling-surplus distribution, though West Bengal is the overwhelming leader among the Indian states, a substantial portion of rural people (approximately 01 million) are still landless and not even owning a homestead plot(NIRD, 2000). They need to be covered up gradually.

Indigenous and Minor crops – easy reach dietary diversity

Habitat destruction & commercial farming squeeze the access of poor people to indigenous and wild foods. As

a result, conventional biodiversity is at stake and the world food basket base is narrowing. This is the point of intervention through conservation of minor vegetables in the homestead plots.

Value of minor cucurbits

- Deeply embedded in food habit
- Low or no-cost production system
- Satisfactory nutritional potential and easy storage
- Gender friendly
- Load of phytonutrients and antioxidant property with free radical scavenging property
- Diversity of use
- Untapped area with high income possibilities

Table 2: Important minor cucurbits of West Bengal with major nutritive values (per 100 g of edible parts)

Crops	Scientific name	Calorie	Protein (g)	Ca (mg)	Fe (mg)	Vit A (IU)	Vit C (mg)
Chow chow	<i>Sechium edule</i>	31	0.9	140	0.6	50	20
Snake gourd	<i>Trichosanthes cucumerina</i>	18	0.5	26	1.1	160	0
Ivy gourd	<i>Coccinea indica</i>	18	1.2	40	1.4	249	15
Wax gourd	<i>Benincasa hispida</i>	10	0.4	30	0.8	1.0	-
Sponge gourd	<i>Luffa cylindrica</i>	18	0.5	36	1.1	120	-
Sweet gourd	<i>Momordica cochinchinensis</i>	40	3	30	3.5	156	Trace
Spine gourd	<i>Momordica dioica</i>	52	3.1	33	4.6	2592	Trace
Snap melon	<i>Cucumis melo var. momordica</i>	14	0.3	NA	NA	265	10
Muskmelon	<i>Cucumis melo</i>	25	0.6	32	1.4	3420	26
Pumpkin	<i>Cucurbita moschata</i>	31	1.4	10	0.7	2180	15
Bottle gourd	<i>Lagenaria siceraria</i>	12	0.2	20	0.7	Trace	6.0
Pointed gourd	<i>Trichosanthes dioica</i>	20	2.0	36	1.7	255	29
Ridge gourd	<i>Luffa acutangula</i>	17	0.5	18	0.5	56	5.0

(Source: B. Choudhury-1983, Bose & Som-1986, Vishnu Swarup-2006). NA-Not available

In cucurbits, generally fruits are eaten but in case of pumpkin, bottle gourd, pointed gourd tender twigs are also equally preferred.

A major portion of the blind people of the world lives in India so the consumption of vitamin A rich vegetables in the country like India is a viable and sustainable approach to prevent the Vitamin A Deficiency (VAD), particularly in places where coverage of pharmaceutical supplements and vitamin A-fortified foods are limited. Homestead nutrition garden is a strategy with synergistic participatory approach to resolve food crisis and hidden hunger in stead of granting the poor some food relief. Here people work for themselves and it demands as a precondition to have increased access to certain resources like land, water, technological intervention, micro credit etc.

Retail market potential

Rural India is a strong market of billions of rupee worth. Small quantity of produce per family but big number of households open enormous opportunity for

the stakeholders. In the present study, a small-area estimate from theoretical perspective showed that through sale of excess produce (fruits, vegetables, eggs, milk, meat, compost etc) an extra income of approximately Rs.200-300 (USD 4-6) per month is feasible in the rural settings of West Bengal. The sale may be an individual effort or through SHGs, Corporate collection or by cooperatives.

Conclusion

The heterogeneity of the problem has been well visited by now. The concern for minor cucurbits is serious, for they are not only facing the wrath of erosion but some are severely endangered. This asynchrony of biology and sociology, tradition and technology has driven the present reality to an oblivious future; and the worst sufferers are the backward segments of the society. The implications of this study have derived some hidden agenda like why do the minor cucurbits are kept aside from the focus of socio-horticultural research! The nutrition and income from cucurbits

have been a blessed synergy for the poor. Thus homesteads can come up as a natural sink, supported by family wisdom and praxis to rear and preserve biodiversity and valuable gene pool, traditional knowledge, child nutrition and education, mother care, age-old members' recess and beyond that revisit the social capabilities, which should be elastic enough to absorb the jerk of impending challenges and changes as well. The traditional homestead gardens with monotypic species dominance need to be upscaled to the standard of improved diversity garden status which grows a wider range of seasonal vegetables in a cyclic manner for quality diet. This should happen in such a way that technology can redeem itself as a natural expansion of humane means to meet human needs.

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