



Assessment of good agricultural practices promoted for safe and sustainable vegetable cultivation in Sri Lanka

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Vegetable Production Systems in Sri Lanka

- **Home gardens**
- **Vegetable – Vegetable** (Year-round, upcountry)
- **Rice – Vegetable** (Dry season [Mar-Sep], mid & low country)
- **Shifting cultivation**-Wet season, low country dry Zone
- **Protected systems** –Mainly in mid and up country



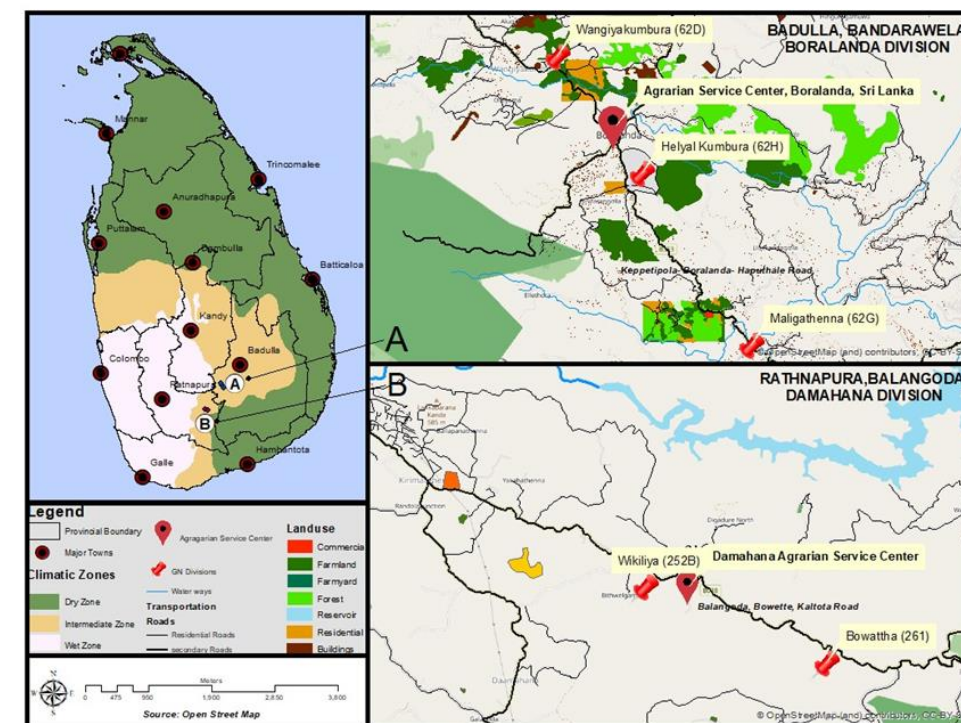
Major constraints for safe, sustainable and year-round vegetable production

- Poor soil fertility conditions
- poor plant health management
- Mismanagement of inputs
- Increasing extreme climatic events,
- Extension gaps
- Market Uncertainty
- Improper pre-harvest and post-harvest practices triggering food waste and losses,
- Lack of conducive policies
- Damages caused by wild animal pests
- capacity constraints of farmers and extension officers.



Farmer participatory trials

- Locations: Two production hubs
- Year: 2023/2024
- No. of farmers: 60
- Area of trial field-250 M² each
- Crops: Carrot, cabbage, and pole bean (20 farmers per crop)
- Collaborations: IWMI, Department of Agriculture- Sri Lanka, World Veg, and BISA
- Protocols developed by World Veg and contextualized by DoA



Good practices introduced for safe and sustainable production

- Soil testing for PH adjustment and fertilizer recommendation
- Production of healthy seedlings using nursery trays- E.g. Cabbage
- Selection of good seed variety and chemical seed treatment
- Recommended spacing and thinning out of plants
- Soil health-Straight fertilizers, and IPNM
- Plant health- Use of biopesticides, recommended cultural practices and recommended dose of synthetic pesticides (IPM)



Differences in input use-Pole bean cultivation

Trial field

- Soil amelioration- Liming based on determined pH
- Seed treatment-Homai (Thiophanate methyl), Cruiser (Thiamethoxam)
- Seeds-1-2 seeds per hole
- Fertilizer- Urea, TSP, MOP and organic fertilizers (poultry manure)
- Pesticides-Policar (Filter Tebuconazole), Chess (Metro pymetrozine), Corogen (Chlorantraniliprole)
- No growth regulators, minerals, and hormones were used

Conventional field (control)

- Lime was added without knowing the pH.
- Seed treatment is not a common practice
- Farmers used multiple seeds per hole
- Fertilizers- **Vegetable Mixture, Potato mixture, Nitrophoska,**
- Pesticides- Policar, Coragen, Deconil (Chlorothalonil), Chess (Metro pymetrozine), **Profenophos, Abamectin**
- Application of growth regulators, minerals, and hormones is very common

Cost and return of Bean cultivation(Partial budget analysis)

Cost component (LKR/ha)	Trial field	Conventional field	% difference
Cost of soil amelioration	26,680	32,838	+19
Seed cost	128,000	205,200	-38
Cost of organic inputs (fertilizers, biopesticides, yellow sticks, etc.)	184,000	73,633	+150
Inorganic fertilizer cost	172,840	683,333	-75
Inorganic pesticides cost	263,200	924,063	-72
Total average purchased input cost	748,040	1,886,229	-60
Average yield (kg/ha)	5935	4120	+44
Gross return (LKR/ha)	2,252,425	1,743,983	+29

Cost and return of Cabbage cultivation(Partial budget analysis)

Cost component	Trial field (LKR/ha)	Conventional field (LKR/ha)	% difference
Cost of soil amelioration	45,550	49,989	-9
Seed cost	184,000	320,000	-43
Cost of organic inputs (fertilizers, Bio pesticides, yellow sticks, etc.)	184,000	100,125	+84
Inorganic fertilizer cost	195,910	963,197	-80
Inorganic pesticides cost	309,600	548,633	-44
Total average purchased input cost	873,510	1,931,955	-55
Average yield (kg/ha)	20157	15754	+28
Gross return (LKR/ha)	3,500,786	2,759,100	+27



Cost and return of Carrot cultivation(Partial budget analysis)

Cost component	Trial field (LKR/ha)	Conventional field (LKR/ha)	% difference
Cost of soil amelioration	49,324	25,530	+93
Seed cost	248,000	221,000	+12
Cost of organic inputs (fertilizers, Bio pesticides, yellow sticks, etc.)	130,000	71,550	+82
Inorganic fertilizer cost	251,840	782,209	-68
Inorganic pesticides cost	86,941	859,453	-90
Total average purchased input cost	716,781	1,934,212	-63
Average yield (kg/ha)	13179	9758	+35
Gross return (LKR/ha)	4,033,859	3,027,341	+33

Descriptive Statistics- Summary of the findings

Crop	Bean		Cabbage		Carrot	
	Trial field	Conventional field	Trial field	Conventional field	Trial field	Conventional field
Average chemical fertilizer use (kg/ha)	655	1215	847	1275	862	1143
SD	14	548	124	613	4	474
P-Value (95% CI)	0.0131		0.0184		0.0486	
Average Chemical pesticide use (kg/ha)	18	95	12	46	11	54
SD	2	443	3	30	1	27
P-Value (95% CI)	0.0174		0.0003		0	
Average yield (Kg/ha)	5935	4120	20157	15754	13179	9758
SD	3891	3684	17361	14513	3979	4049
P-value (95% CI)	0.028		0.0074		0.0005	
Average gross income (LKR/ha)	22,52425	17,43983	35,00786	27,59100	4033859	3027341
SD	14,08893	14,60141	35,23764	35,67430	25,14711	25,20442
P-value (95% CI)	0.0307		0.0057		0.0000	

Summary of the findings (2)

- Reduction in inorganic fertilizer use- 12-42%
- Reduction in inorganic pesticide use -41-96%
- Increase of crop yield- 22-44%
- Increase of gross income- 21-33%

Concluding remarks

- The good practices promoted by the project have increased input use efficiency.
- Side-by-side trials and control plots in the participatory farmers' fields provided clear evidence of overdosing chemicals and other resources
- Promoting simple technologies - soil testing to decide the soil pH and fertilizer recommendation, IPNM, IPM, etc can convert the conventional farming system into a more sustainable way of cultivation.
- However, changing the farmers' traditional behaviors, beliefs, and attitudes requires continuous guidance and interventions for long-lasting change.



Thank You



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