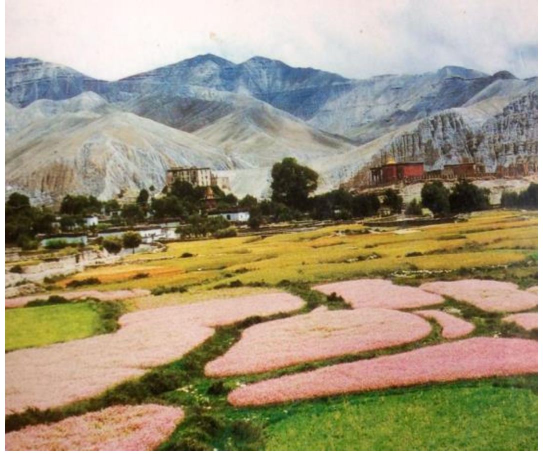
Value Chain Development of Traditional Crops for Nutrition Sensitive Agriculture : Experiences from the Nepal Mountains*



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Presentation Outline

- Introduction: Importance of traditional crops for Nutrition
- Objectives and Methodology of the study
- Conceptual Framework of Nutrition Sensitive Value Chain
- Study Findings : Status of Crop Diversity and Import
- Value Chain Mapping and Analysis
- Progress in Upgrading/Strengthening Value Chains
- Conclusions and Implications

Diversity of Traditional Mountain crops in Nepal Himalaya

These crops account for 30-75 % of the area in high mountain region of Nepal and 60-74% in Mugu, Jumla and Humla (Karnali region) in 2016-17

Value of Traditional Food Crops in Nepal Mountains

- **Traditional crops** (buckwheat, barley, beans, amaranths, finger millets, foxtail millet, proso millets) are **indigenous**, **nutrient dense**, **climate resilient**, and grown as **default organic crops**

- **Many** of these crops are **C4 plants, photosynthetically more efficient** require no **costly external inputs and are tolerant** to **harsh cold** environment, drought, **poor soils** and disease, pests

- **Matures in very *short period* making food available early in lean season** for resource poor food insecure households

- **They are gluten free**, rich in **micronutrients**, high **dietary fibers** and with **rare amino acids** and **Vitamins**, hence called, "**Future Smart Food**" or **Himalayan Superfoods** (www.himalayancrops.org)

Comparative Nutrient Compositions of crops (Nutrients/100 gms)

Crops	Protein (g)	Fat (g)	Carbo-hydrate(g)	Minerals (g)	Fiber (g)	Energy (Kcal)	Calcium (mg)	Phosphorous (mg)	Iron (mg)
Foxtail millet	12.3	4.3	60.9	3.3	8	331	31	290	12.9
Proso-Millet	11	4.2	72.9	3.2	1.0	378	8	28.5	3
Amaranth	9.4	7.2	68.1	2.6	2.2	375	37	529.1	5.2
Barley	11.5	1.3	69.6	1.2	3.9	336	26	215	1.7
Naked barley flour	9.6	2.6	76.7	1.9	2.0	369	-	-	1.4
Finger Millet	7.7	1.2	70.1	2.9	3.7	322	288	276	49.1
Buckwheat	6.1	1.3	69.2	3.1	7.8	313	-	-	5.6
Bean	24.9	1.3	60.1	3.2	1.4	347	60	433	4.4
Rice (milled)	6.8	0.5	78.2	0.6	0.2	345	10	160	0.7
Maize flour	9.2	3.9	72.1	1.2	1.6	360	20	256	2.4
Wheat flour	12.1	1.7	69.4	2.7	1.9	341	48	355	4.9
Potato	1.6	0.1	22.4	0.6	0.6	97	10	40	0.46

Source: DFTQC (2012)

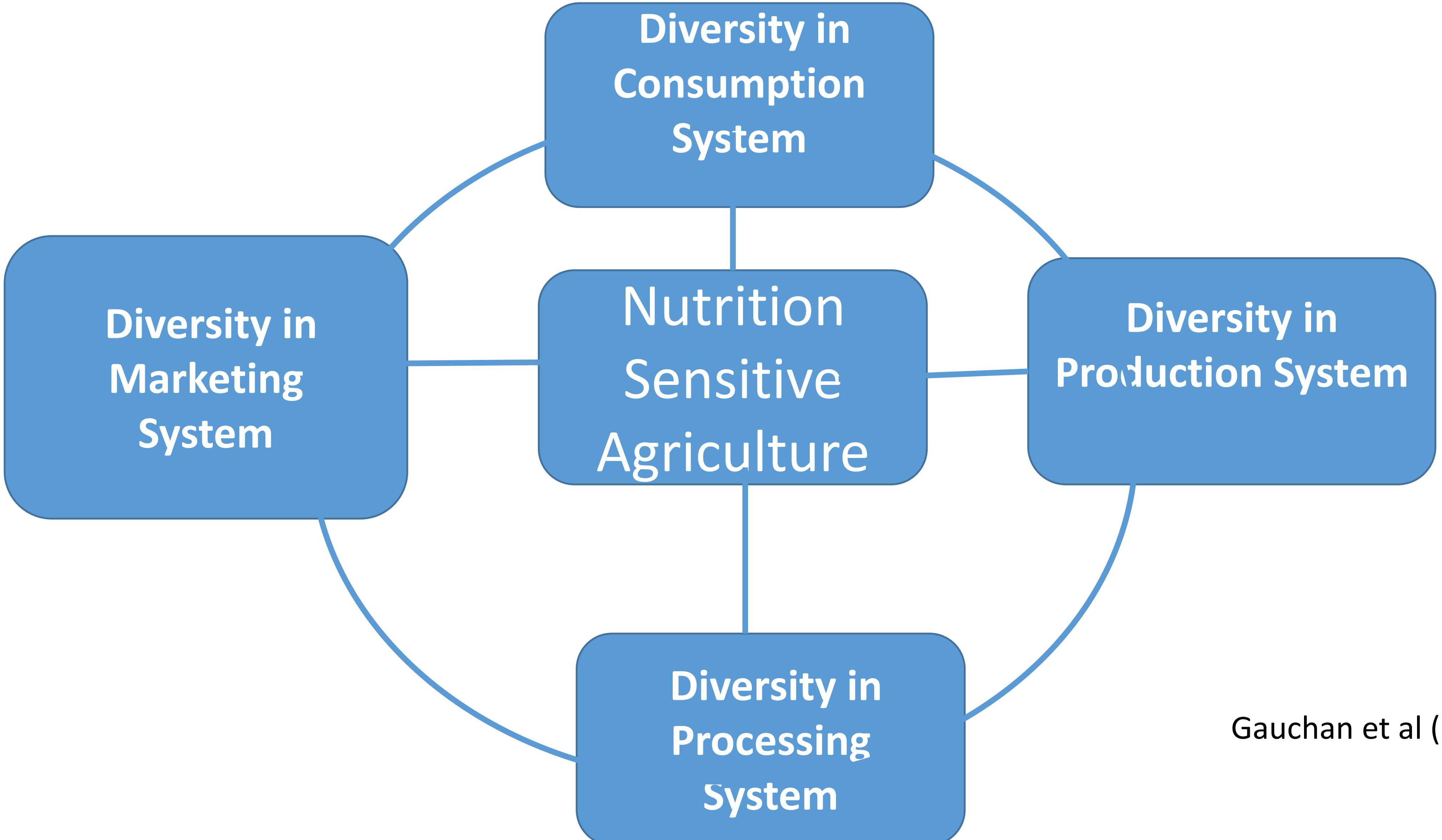
Why Value Chains Development of Traditional Food Crops for Nutrition Sensitive Agriculture (NSA) in the mountains?

- **Important staple food crops** in the **high mountains** for food and nutrition security

- **Locally adapted, accessible, affordable and globally** and **nationally significant rich diversity of gene pools** available **for nutrition, resilience & climate change adaptation**

- **Potential** to **improve interlinkages** and **efficiency in the value chains** and promote **nutrition value** in the **food system to** meet **nutrition and healthy diets** of growing population in Nepal

Biodiversity-based Value Chain for Nutrition Sensitive Agriculture



Gauchan et al (2019)

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Objectives the study

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Science for a food secure future

1. To **explore** and **develop value chain map**, and **assess actors** and **constraints in the value chains** of traditional underutilized crops and

2. To **assess potential role of traditional crop biodiversity in nutrition sensitive agriculture** for mountain food and nutrition security

Methodology

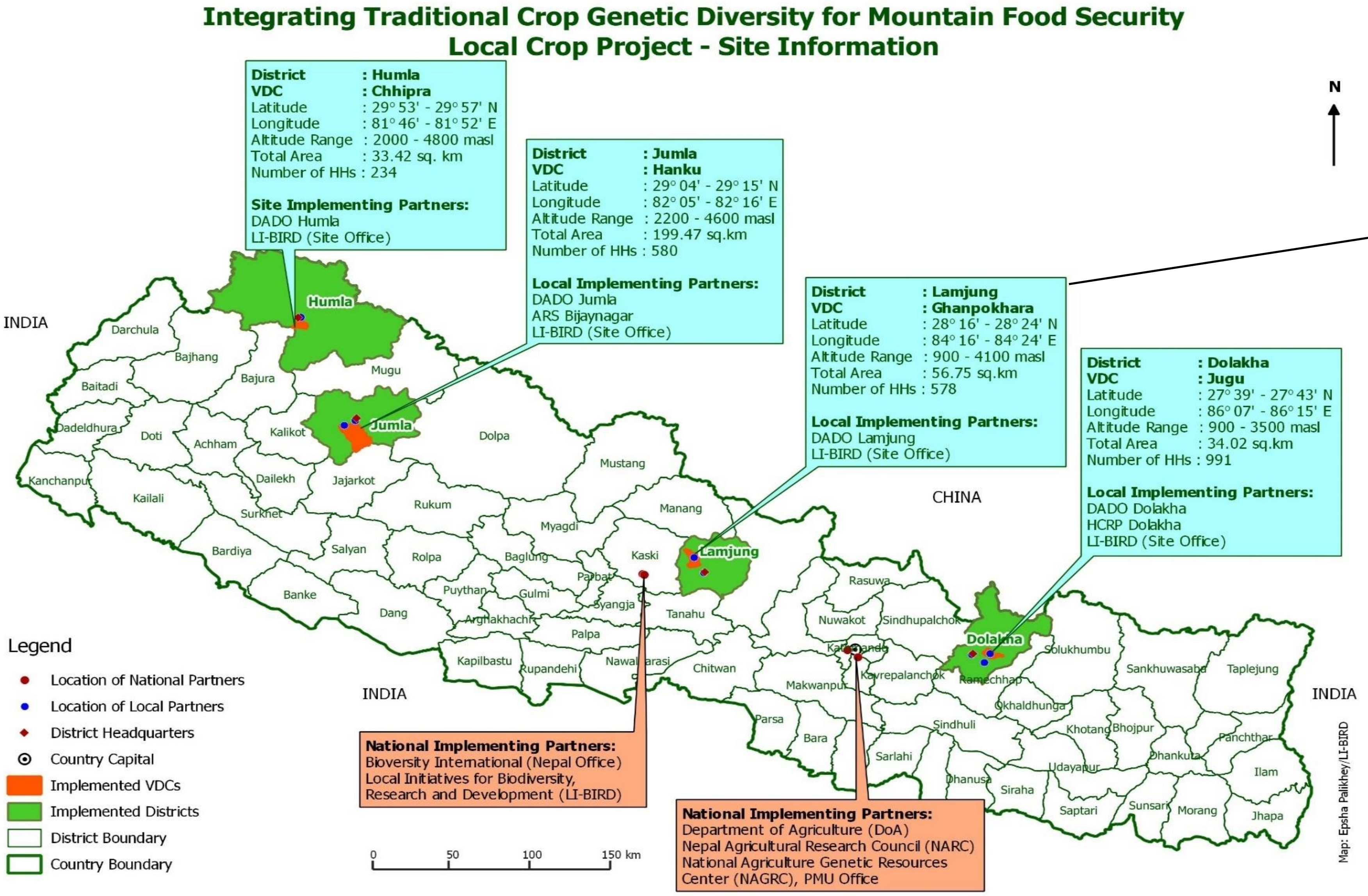
- **Combining value chains of biodiversity** and **nutrition sensitive agriculture** of traditional crops from four representative high-altitude locations of **Humla, Jumla, Lamjung & Dolakha districts** (1500-3000 msl)

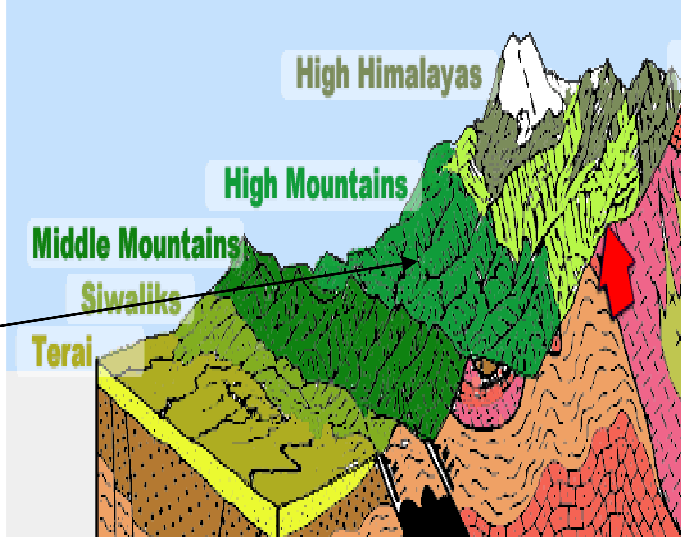
- **A mix of qualitative** and **quantitative methods** using **field surveys** for **mapping the value chains components**, key actors, constraints and suggested potential interventions

- **Information** supplemented with **baseline survey, participatory rural appraisals, field visits, consultation meetings**, and **monitoring** in the sites

- **Value Chain upgrading** and **value chain validation** from local and national review and stakeholder workshop

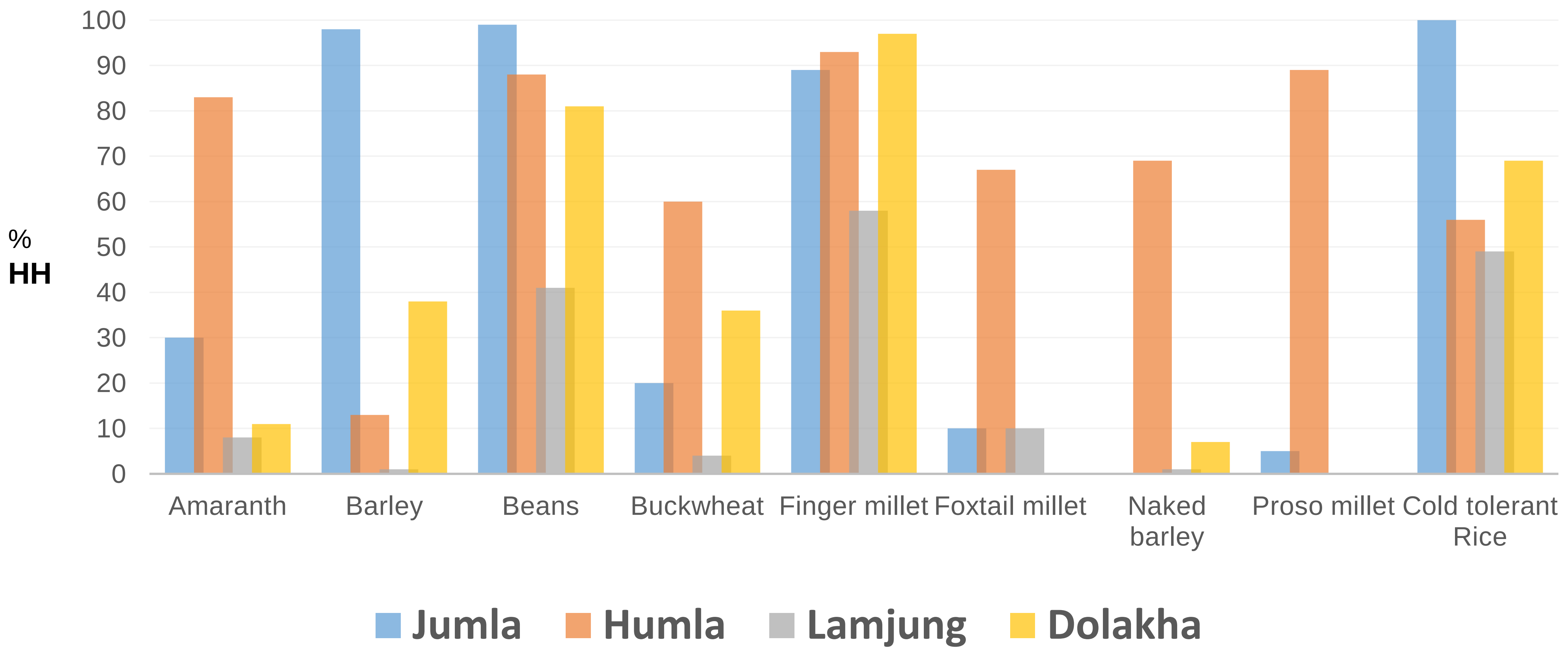
Study sites in Nepal





Dominance of Traditional Crops in the Study Sites

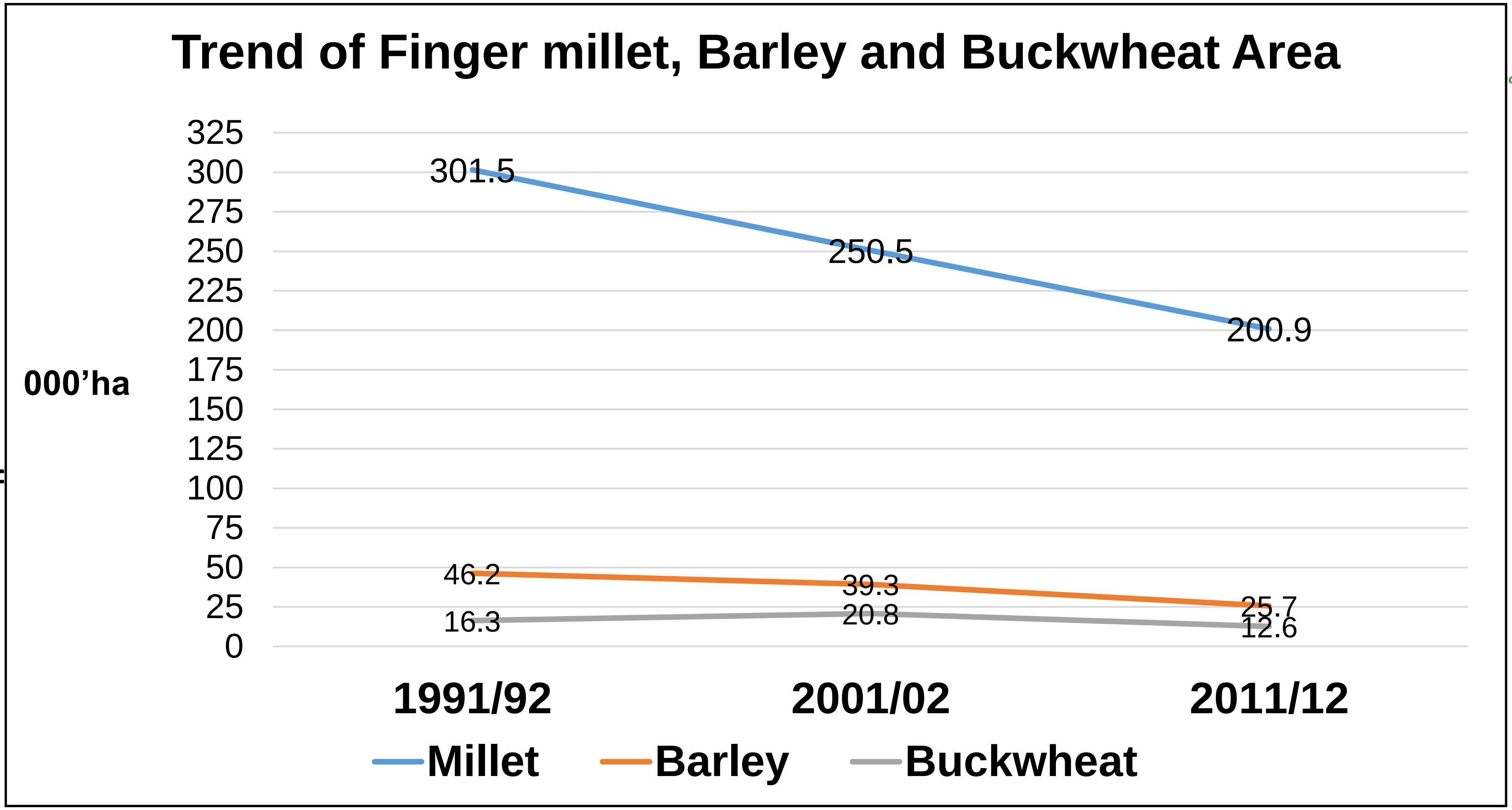
% Households Growing (N=328)



Declining Area and Productivity of Traditional Crops

- Trend of **declining area** in 3 decades

- **Low productivity** of Barley, Buckwheat and Millet



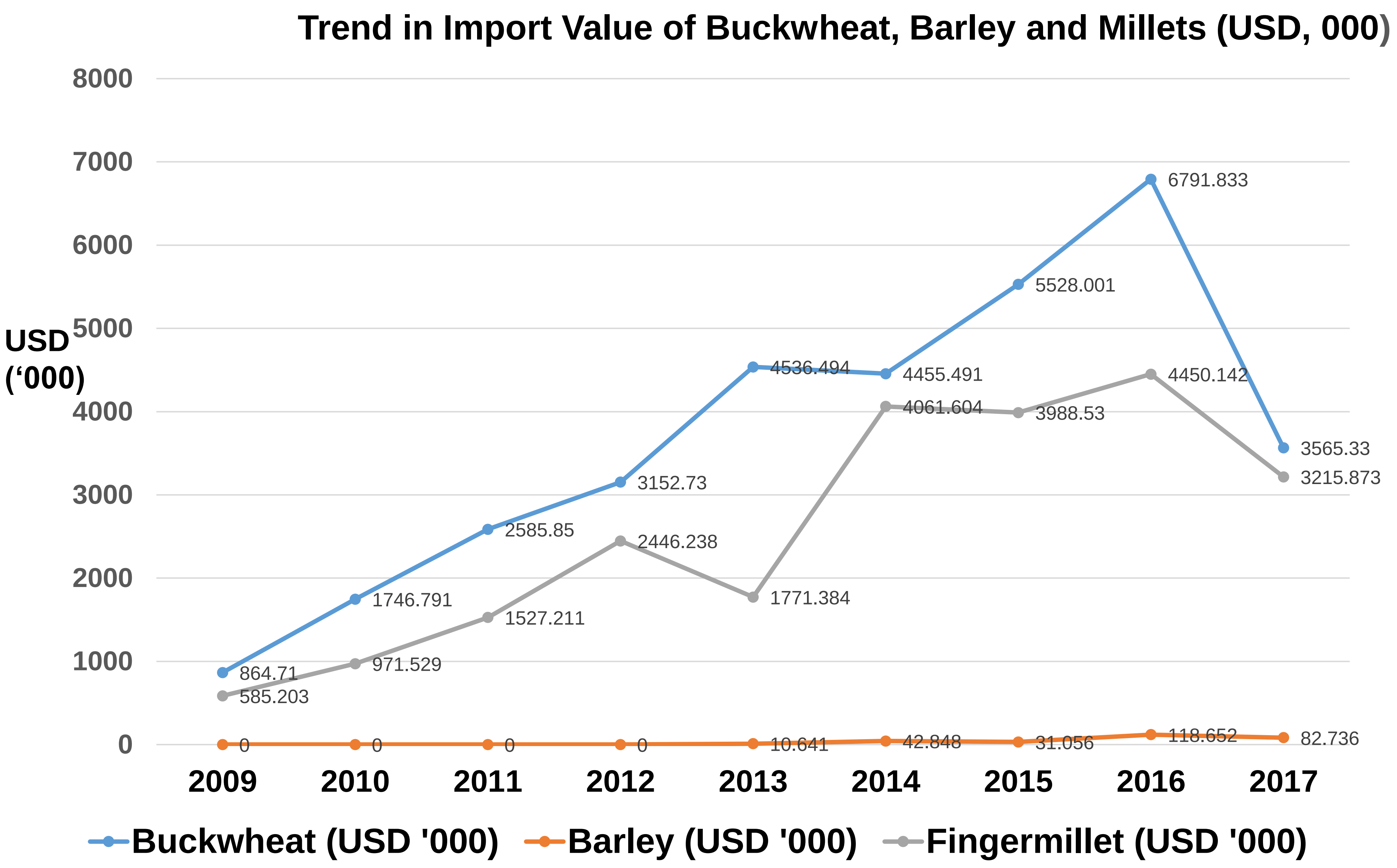
Source: CBS (2012)

Comparative yield and yield growth rates of Barley, Buckwheat & Millets with major Crops

Growth rates	Barley	Buckwheat	Millet	Rice	Maize	Wheat
Yield (MT/ha) in 2016	1.03	1.08	1.16	3.36	2.52	2.59
Yield growth (%) per annum (1986-2016)	1.00***	-	0.43**	1.70***	1.98***	2.60***

Computed from MoAD (2017)

Import Value of Traditional Crops



Source: TEPC (2018)

Mapping Value Chains of Traditional Food Crops

Seed system	• Poor Seeds quality, diversity, availability
Product ion	• Poor crop management and diversificatin
Processi ng	•Processing manually and laborius with high women drudgery
Promoti on	•Informal trading, exchange ; limited awareness of nutrient value of crops
Consum ption	•Locally consumed but declining with encroach of modern food culture

Policy Environment

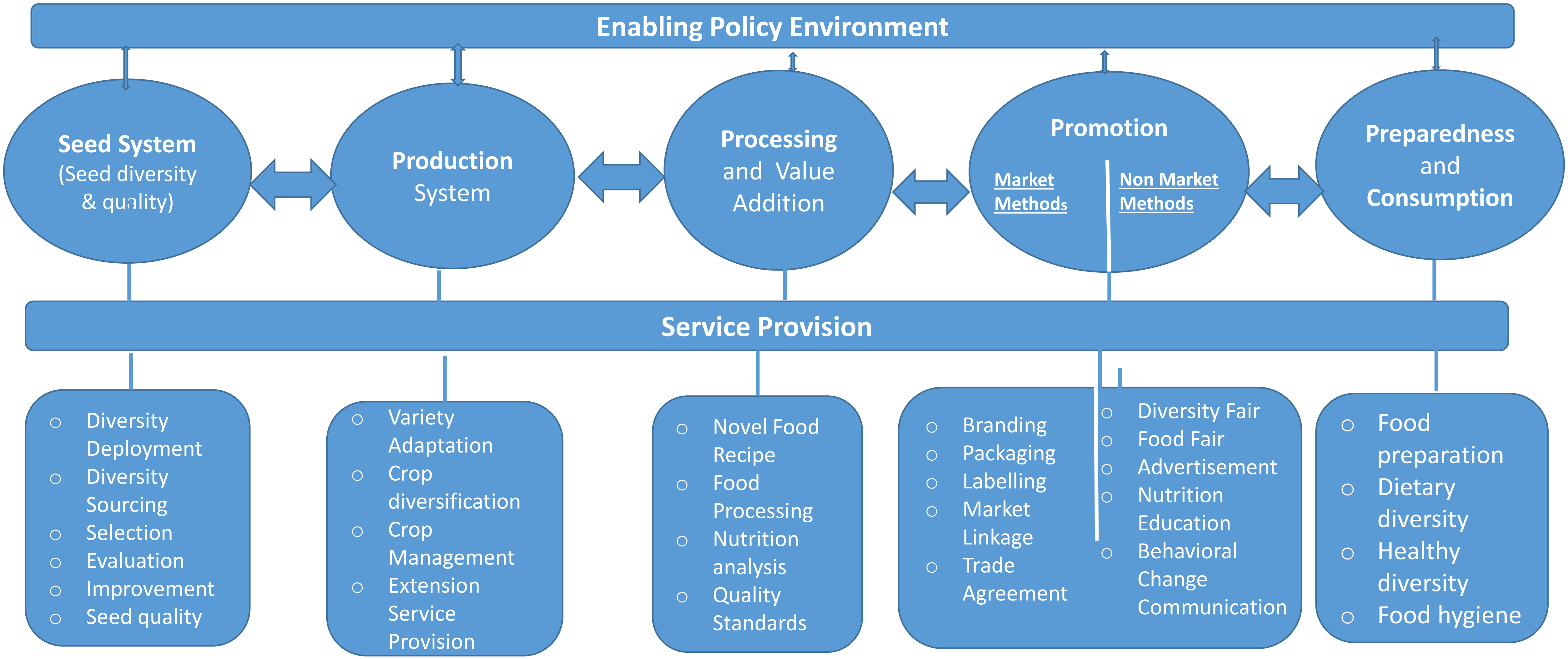
- ***Under developed, poorly connected, informal value chains***
- **Limited participation of R &D Actors & Private sectors**

Driving Factors in Value Chains

4 "P'

1. Production
2. Processing
3. Promotion
4. Policy

Value Chain Upgrading of Traditional Crops for Nutrition Sensitive Agriculture



Source: Gauchan et al (2019)

Improving Seed and Production Systems

- **Community seed banks (CSBs)** established & operationalized for improving **availability**, **diversity** & **quality** of adapted seeds **in seed and production systems**

- **Sourcing and deployment of diversity** of traditional crop genetic resources (>300 germplasms) from National Genebank & Research Centers to **Farmers Fields** in 4 Project sites

- **Maintenance and multiplication of source seeds for** enhancing access, strengthening local seed & prod systems

- **Diversity-based Farmers Field Schools (DFS)** and **Diversity (Seed) Fairs** for improving seed and production systems

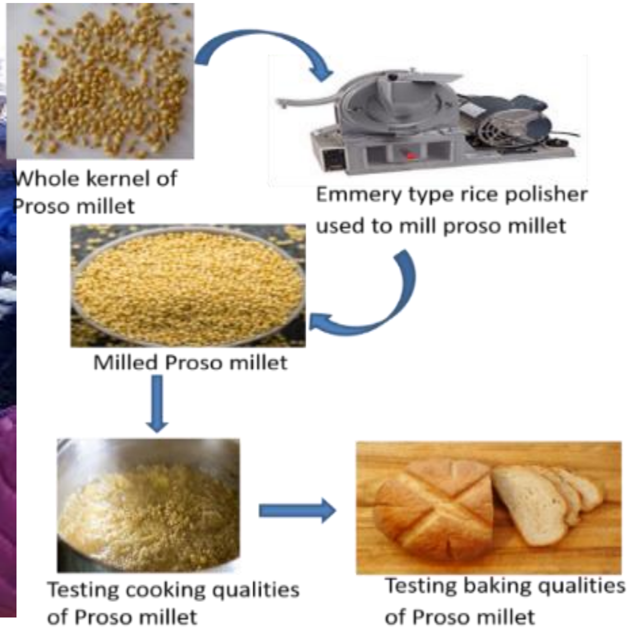
- **Building capacity of farmers** in **grass roots / participatory breeding and variety selection** for improving their traditional diverse **crop varieties**, **seed quality** and **registration** system

Improving Processing System

- **Design, development and piloting simplified electric thresher for proso millet *(Chino Kutak) and upscaling of finger millet Thresher (pearler)*** to meet the needs of local community in **the Mountains**

- **Improving efficiency in production and reducing drudgery of women and children (e.g. 4 times efficient** in **saving cost** and **reducing women drudgery)**

- **Testing of baking** and **cooking quality** and **Nutrition Analysis** to identify **varietal differences** on specific **nutrition contents** for market promotion



Improving Market System

- **Development** of **Tripartite Agreement** among Project, local CBOs and Entrepreneurs for **marketing of local diversity**
- **Support** to local **entrepreneurs and Bakery** (Humla Delight) for ***Food Menu***, ***in labeling, Branding & Marketing***
- **Facilitate** farmers, **entrepreneurs** and **homestay groups (Lamjung)** in marketing through **Organic & Food Fairs**
- **Training** and **Exposer Visits** of **farmers, entrepreneurs** and **hotel owners** in processing, **food recipe formulation**

Improving Policy System

- **Simplifying variety release /registration system** of traditional crops and landraces for **official listing** and **commercialization**

- **Policy review and analysis to recommend, harmonize and reform** seed, agrobiodiversity and agricultural policies for the promotion of diverse farmers varieties

- **National** and **local** level **interactive workshop**, **consultation meetings** and **training programs** with diverse **stakeholders to enhance capacity of farmers, R &D stakeholders**

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Conclusions and Implications

- **Traditional crops** have **global significance** with **unique gene pools** for **nutrition, resilience** & **climate change** adaptation
- **Market and value chain development** with **better linkages & flow of information**, knowledge and products in food system
- **Technology**, **institutional** & **policy interventions** with **shared market information, value addition & product diversification**
- **Investment in R&D & Education** for appropriate **technologies**, **diversity rich solutions** and **value chain** upgrading
- **Incentives needed** for **biodiverse food system** supported by **policy, demand** and **supply side** interventions
- **Targeted *niche* value chain** through **organic production & certification system** linking with **Geographic Indication**

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Thank you

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