

Quality parameters in relation to consumer's preferences in ricebean

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Outline

- ❖ Ricebean – an orphan crop
- ❖ Ricebean network
- ❖ Consumer's evaluation
- ❖ The field work
- ❖ Results & interpretation
- ❖ Conclusion

Ricebean: An orphan pulse crop in India and Nepal

- ❖ Ricebean (*Vigna umbellata*) as 'orphan crop' has been overlooked by the research community despite its importance:
 - High nutritional value,
 - well adapted to the low-input conditions typical of marginal areas,
 - gives yields where modern crop varieties can barely survive,
 - grows well on a wide range of soils,
 - shows pest tolerance,
 - potential for good yields along with nutritious fodder.

- ❖ However, there are no improved varieties, and so the ricebean has fallen behind other pulses and only poor farmers in marginal areas grow it.

Ricebean: An orphan pulse crop in India and Nepal



Nutritional composition of ricebean

Chemical composition of ricebean compared to other pulses

Crop	Protein (%)	Ash (%)	Fat (%)	Fibre (%)	Ca (mg/100g)	Fe (mg/100g)	P (mg/100g)
Ricebean	25.0	4.3	0.6	4.8	450.0	6.0	393.0
Greengram	23.6	4.0	1.2	3.3	199.0	7.5	313.0
Pigeonpea	20.9	3.9	1.5	3.1	296.0	6.7	366.0

Source: Dutta, M. 2000

Chemical composition of collected ricebean samples in India and Nepal, January to February 2008

	Protein (%)	Ash (%)	Fat (%)	Fibre (%)	Carbohydrates (%)	Moisture (%)
Mean	22.49	4.05	0.39	4.70	65.07	10.26
Minimum	14.53	2.44	0.12	3.55	58.15	8.10
Maximum	32.16	9.54	0.75	6.98	71.99	15.51

n = 167, Source: own calculations

Aims: Make ricebean much more widely grown

By providing varieties that match farmers' and consumers' needs

- ❖ 'Food Security through Ricebean research in India and Nepal' (FOSRIN)
- ❖ 6th Framework Programme of the European Commission
 - Gramin Vikas Trust, Dahod, Gujarat, India
 - Agricultural University Palampur, Himachal Pradesh, India
 - Agricultural University Jorhat, Assam, India
 - Nepal Agricultural Research Council (NARC), Kathmandu, Nepal
 - Li-Bird (NGO), Pokhara, Nepal
 - Christian-Albrechts University Kiel, Germany
 - CAZS-NR Bangor, UK
 - University Bergen, Norway

Consumers evaluation I

- ❖ Quality of goods is a collection of characteristics (nutrients)
- ❖ Consumers are not evaluating the good itself but its characteristics and their present amount
- ❖ Product heterogeneity arises because different products contain different kinds, different amounts, or both of various characteristics
- ❖ Consumers show their preferences by their willingness to pay
- ❖ Market prices vary with certain characteristics
- ❖ Price variation can be explained by **quality variation** / presence and quantity of certain characteristics

Consumers evaluation II

Price paid

=

sum of the marginal monetary values of product's characteristics



marginal monetary values of one characteristic

=

quantity of the characteristic in one unit of the product \times marginal
implicit price of that characteristic

Hedonic Price Analysis

- ❖ Link ricebean prices to the selected **quality** characteristics in the ricebean
- ❖ Explain price variation of 167 ricebean samples by determined characteristics
- ❖ Price as dependent variable & characteristics as independent variables

$$\ln P_i = f(\ln q_1, \dots, \ln q_n)$$

- ❖ Ln form of price and metric variables: coefficients as elasticities

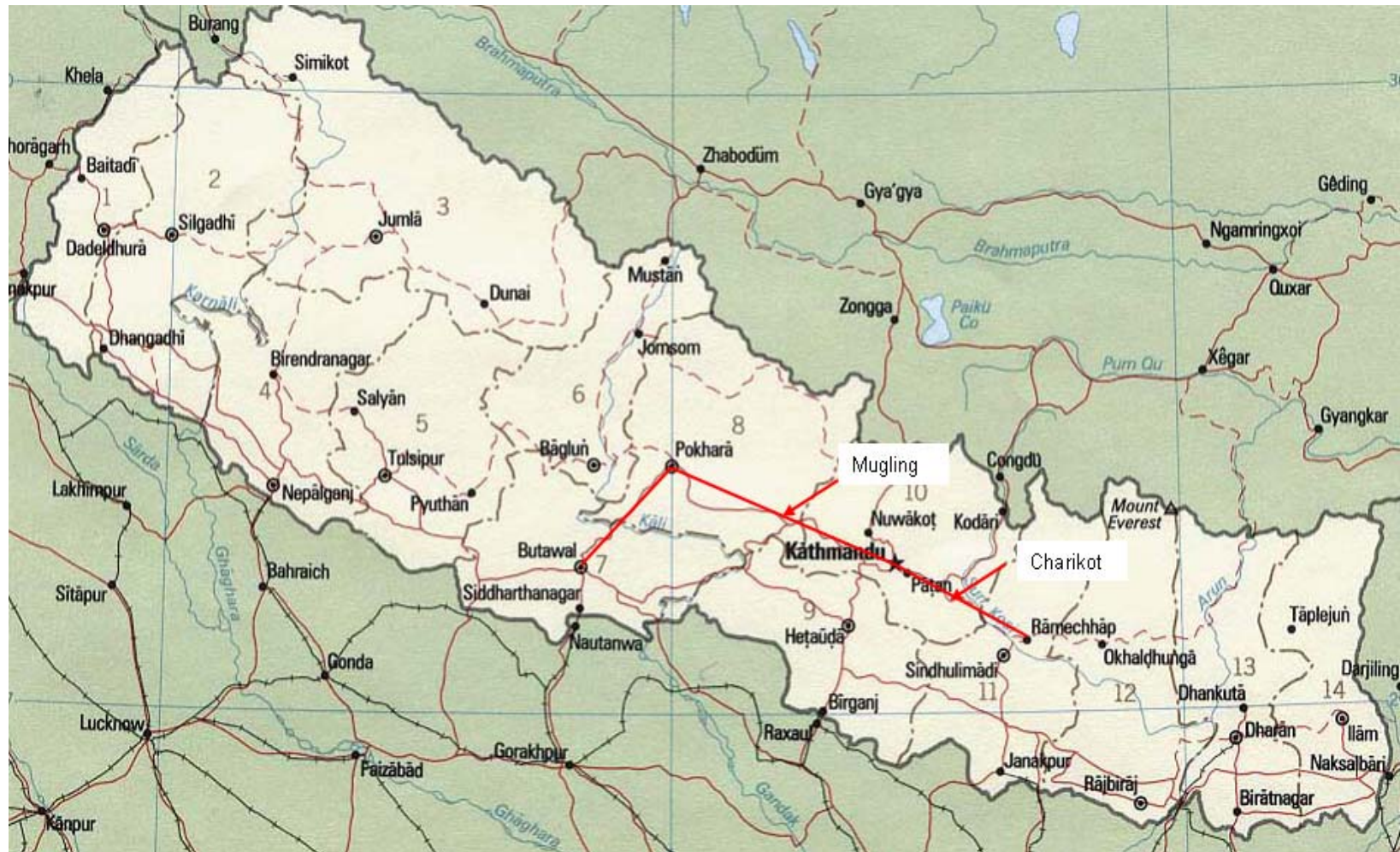
The field work

- ❖ 7 January 2008 – 25 March 2008:
 - collection of 167 ricebean samples in Nepal and India

- ❖ Nepal: 12 locations in 9 districts, samples: 114
 - Lab analysis at Li-Bird

- ❖ India: 19 locations in 3 states, samples: 53
 - Lab analysis at the Anand Agricultural University

Locations in Nepal



Locations in India



Determined characteristics

Characteristic	Unit	Mean	Minimum	Maximum
Price India/ kg	Indian Rupees INR	23.30	12.20	36.00
Price Nepal/ kg	Nepalese Rupees NRs	43.36	10.00	80.00
Weight	g/100 seeds	9.14	4.07	19.42
Water uptake	Ratio of weight increase	2.00	1.69	2.24
Swelling capacity	Ratio of Volume increase	1.33	1.02	1.96
L/B ratio	Ratio length to breadth	1.66	1.31	2.10
Foreign material	%	6.78	1.10	19.31
Moisture	%	10.26	8.10	15.51
Ash	%	4.05	2.44	9.54
Fat	%	0.39	0.12	0.75
Protein	%	22.49	14.53	32.16
Carbohydrates	%	65.07	58.15	71.99
Crude fibre	%	4.70	3.55	6.98
Colour diversity	Herfindahl-Index	0.62	0.27	1.00

Colour diversity index

- ❖ Herfindahl-Index

$$HI = \sum_{i=1}^n s_i^2$$

- ❖ Ranges from $1/n$ to 1

Hedonic Price Analysis - Nepal & India

Variables	Coefficient	T-value
Constant	1.936 **	3.24
Country	0.915 **	8.45
Orissa	0.078	0.99
Uttarakhand	0.197 **	2.52
Ramechhap	-0.403 **	-8.38
Dhading	0.238 **	3.77
Chitwan	-0.155 **	-3.18
Syanja	0.226 **	2.86
Nawalparasi	0.107	1.16
Moisture	-0.107	-0.82
Protein	0.166	1.42
Fat	0.095 *	1.75
CrudeFibre	0.346 **	2.84
Ash	-0.192 *	-1.85
Seedweight	0.250 **	4.06
Foreignmatter	-0.076 **	-2.36
LBRatio	0.157	0.94
Black	0.024 **	3.95
Gray	-0.009 *	-1.81
Olive	-0.012 **	-3.13
Red	-0.005	-1.13
Colour diversity	-0.121 **	-2.18

N = 167 adj. R²: 0.84

* significant at α : 0.1, ** α : 0.05

Summary of the hedonic price analysis

Positive

- Crude fibre
- Seed weight
- Colour diversity
- Black
- Fat

Negative

- Foreign material
- Olive
- Ash
- Gray

Interpretation of the results

Characteristic	Mean	Minimum	Maximum	Difference	%	Coefficient	Price effect %
Crude Fibre	4.70	3.55	6.98	2.28	48	0.35	17
Ash	4.05	2.44	9.54	1.61	40	-0.192	-8
Foreign matter	6.78	1.10	19.31	5.68	84	-0.08	-7
Seed weight	9.14	4.07	19.42	10.29	113	0.250	28



Conclusion

- ❖ Provide (breed) a ricebean variety which matches consumers & farmers needs

Seed size +
Crude fibre +
Colour diversity +
Ash –

Enhanced quality

x

High yield
Pest resistant
Drought tolerant

More beans to sell

= Improved ricebean for consumers &
more income for farmers

Thanks!!