Is there an Urban Market Niche for Vegetables from Tribal Jharkhand, India?

Kriesemer[a][1], Simone Kathrin, Katinka M. Weinberger[b], Madan L. Chadha[c]

[a] AVRDC – The World Vegetable Center, P.O. Box 42, Shanhua, Tainan 74199, Taiwan.
[b] CIFOR, Forests and Livelihoods, Bogor, Indonesia.
[c] AVRDC – The World Vegetable Center, Regional Center for South Asia, Hyderabad, India.

Introduction

In Jharkhand, AVRDC – The World Vegetable Center is promoting vegetable production among tribal communities with the goal of diversifying diets and improving household nutrition. Over time, farmers also may be able to generate income from commercial vegetable production if suitable market opportunities are identified. AVRDC – The World Vegetable Center's Regional Center for South Asia advocates integrated pest management (IPM) for safe vegetable production, and when IPM is successfully adopted, suggests that vegetables be labeled in a way to indicate the production method, e.g. as "safely produced." However, little is known about consumers' shopping preferences in Jharkhand and neighboring West Bengal. The questions this study posed were: to what extent could higher quality vegetables be marketed through quality market channels and how much would urban wet market consumers be willing to pay for vegetables free of pesticide residues?

Material and Methods

The study used a survey format to collect information about respondents' sociodemographic characteristics, their vegetable shopping behavior, and criteria of importance for buying vegetables with a structured questionnaire. The interviews then focused on respondents' willingness to pay for "safely produced" and "certified organic" eggplant (in 269 cases) and cauliflower (in 227 cases). A short paragraph was read out to respondents to inform them of the definition of "safely produced" and "certified organic" vegetables. Willingness to pay was elicited using the open-ended method (WALSH et al. 1984) by asking how much respondents would be willing to pay for the respective quality of vegetables. Finally, questions about the latent constructs of the theory of planned behavior (Figure 1) were integrated into the structured questionnaire, following the methodology suggested by AJZEN (2002). These questions inquired about respondents' intention, attitudes, subjective norm, and perceived behavior control of "*purchasing safely produced eggplant/ cauliflower whenever it is available in the market places where they buy their vegetables at the price of ___[2] INR/kg.*" Answers were recorded using a Likert scale from one to seven where positive and negative ends were interchanged from question to question (FRANCIS et al. 2004). The questionnaire was translated into Hindi and Bengali, back-translated into English, and pre-tested before interviewing 500 vegetable consumers face-to-face at wet markets in November–December 2009.

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[1] Corresponding author, e-mail: simone.kriesemer@worldveg.org
[2] The individual price each respondent indicated he/she was willing to pay.
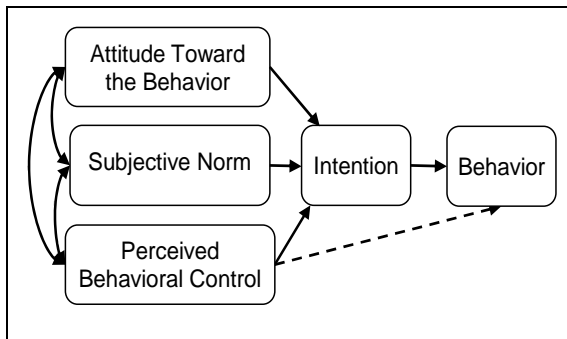
Figure 1: Theory of Planned Behavior
Source: AJZEN AND MADDEN (1986)

The cities of focus, Kolkata and Ranchi, were stratified into five and four areas, respectively, each containing about 20 quarters, of which one quarter was selected randomly for each area. Every seventh customer passing was approached by the interviewers and on average, 2.8 persons were approached before a candidate was identified who was willing to be interviewed. The paragraphs on quantitative survey results present the outcome of descriptive statistics. A multiple linear regression model was used for the theory of planned behavior variables.

Results and Discussion

The survey yielded 497 usable questionnaires. In Kolkata, a total of 375 interviews were conducted and 122 vegetable shoppers in Ranchi were interviewed. The responses of 368 men and 129 women were collected. The mean age of respondents was 32 with ages between 14 and 75 years represented. The level of education was relatively high with about 38% of respondents indicating having a bachelor degree of arts, science, or commerce. Taking into consideration the fact that only every third person who was approached was willing to be interviewed, this hints towards the presence of a self-selection bias that is likely in sampling designs where respondents are approached in public.

Vegetables were purchased fresh and frequently in the sampled markets with 35% of respondents buying vegetables every day, 25% visiting the market five or six times per week, and 20% four times a week. Twelve and a half percent came to the market three times a week and shoppers who bought vegetables once or twice a week were less than 2% and 6% of the sample, respectively. The median vegetable purchasing frequency was five times per week.

Per month, respondents purchased 45 kg of vegetables on average, which corresponds to 289 g of vegetables purchased per capita and day. On average, households spent INR 1,539 (SD 1,204) per month on vegetables and INR 2,910 (SD 1,626) for other food items. The mean total food expense per household was INR 4,464 (SD 2,217)[3] and consequently, the share of vegetables in the total food expenditure was 33%. In comparison, the average vegetable share in total food expenditure for urban Jharkhand and urban West Bengal was 16% and 14% respectively (calculated from GOVERNMENT OF INDIA 2008).

Respondents were asked to judge the importance of nine criteria for the selection of vegetables they purchase. Answers were collected using a five point Likert-scale: "very important" (5), "important" (4), "not sure" (3), "little/not important" (2), and "not important at all" (1). Most respondents agreed that good visual appearance (i.e. absence of spots and defects) (mean score 4.63, SD 0.758), cleanness (mean score 4.62, SD 0.705), a low price (mean score 4.52, SD 0.965), and nice color (mean score 4.39, SD 0.883) are criteria that they consider. The trust in vendor received some positive attention (mean score 3.62, SD 1.359) but had the highest standard deviation, which indicates divergent points of view about this criterion. The criteria information provided on the label, packaging, presence of a quality label and information about the geographical origin of the product were considered less important, with mean scores below 2.52 and standard deviations below 1.140.

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[3] The standard deviations for both the expenditures for vegetables and other food items were found to be high. However, cases with very high expenses appeared plausible, bearing in mind the close coexistence of very rich and very poor people in India.

Overall, 41% of respondents were willing to pay more for safely produced vegetables while 41% wanted to pay the same price and 17% were willing to pay less than what they usually pay for their cauliflower and eggplant.

The mean real prices on the day of the interview for eggplant and cauliflower were 16.3 INR/kg and 16.9 INR/kg, respectively (Table 1). Consumers were willing to pay 16.4 INR/kg for "safely produced" eggplant and 18.4 INR/kg for "certified organic" eggplant on average. The average prices consumers were willing to pay for cauliflower was slightly higher, namely 18.3 and 20.0 INR/kg for "safely produced" and "certified organic" cauliflower, respectively.

Table 1: Actual prices and willingness to pay for "safely produced" and "certified organic" eggplant (N=254) and cauliflower (N=213), (in INR)

| | Mean price | | Willingness to pay for | |
| | | | "safely produced" | "certified organic" |
Vegetable	today	(if today's price is unknown) last time	vegetable	vegetable
Eggplant	16.3 (4.18)	15.2 (4.52)	16.4 (5.20)	18.4 (11.55)
Cauliflower	16.9 (5.63)	17.4 (5.48)	18.3 (6.16)	20.0 (10.87)

Note: numbers in brackets are standard deviations

The increases in price consumers were willing to pay are higher for "certified organic" (14% for eggplant and 20% for cauliflower) compared with "safely produced" vegetables (6% for eggplant and 12% for cauliflower) (Table 2).

Table 2: Percentage consumers are willing to pay more for "safely produced" and "certified organic" eggplant (N=254) and cauliflower (N=213), (in %)

Vegetable	"safely produced" vegetable vs. today's or last time's price	"certified organic" vegetable vs. today's or last time's price	"certified organic" vegetable vs. "safely produced" vegetable
Eggplant	6.20 (.325)	13.66 (.354)	8.98 (.162)
Cauliflower	11.71 (.347)	20.05 (.377)	11.16 (.677)
Both vegetables	9.00 (.349)	16.62 (.366)	7.97 (.156)

Note: numbers in brackets are standard deviations

The following results apply for respondent's willingness to pay for "safely produced" eggplant and cauliflower. "Certified organic" vegetables were not considered in this part of the study. Responses to questions measuring intention, subjective norm, perceived behavior control and attitudes were recoded such that all positive answers scored on the higher end of the Likert scale and were checked for internal consistency. Cronbach's Alpha for perceived behavior control (.630) could have been improved by dropping two items from the construct but because the reliability coefficient was sufficiently high (>.6 as suggested by FRANCIS et al. [2004]), the construct was kept as such. Likewise, all items were retained for behavioral intention and attitudes that had Cronbach's Alphas of .595 and .703, respectively. Subjective norm questions had a consistency coefficient of .449 before and .470 after dropping one question from the list. Subsequently, overall scores were computed by calculating the mean for each construct as suggested by FRANCIS et al. (2004).

All constructs correlated significantly with each other. The scores for intention, attitudes, subjective norm, and perceived behavior control ranged from 1 on the negative end to 7 on the positive end. Except for the attitudes, the mean scores were slightly above the neutral level score, 4 (4.71 to 4.98), indicating the respondents had a very weak but positive point of view regarding these constructs. Their attitude scored slightly higher (5.33).

Using multiple linear regression revealed that the theory of planned behavior model was able to explain 35% (adjusted R^2 = .349) of the variance of consumers' intention to purchase "safely

produced" vegetables (Table 3). The standardized beta values indicate the unique importance of the independent variables. This means that the dependent variable I (intention) will increase by 0.463 standard deviations when the independent SN (subjective norm) increases by one standard deviation while all other independents are held constant.

Table 3: Regression results

Variable	Standardized Beta	t	R^2	Adjusted R^2
(Constant)		7.02		
SN	.463 ***	11.94		
A	.331 ***	6.63		
PBC	-.169 ***	-3.51		
			.353	.349

Note:*p < 0.05,**p < 0.01,***p < 0.001; SN= subjective norm, A= attitudes, PBC= perceived behavioral control

Conclusions and Outlook

The criteria that consumers used to choose their vegetables do not favor the rapid diffusion of vegetables with quality labels or indications of a certain geographical origin. Respondents had a weak positive intention to purchase eggplant and cauliflower at the rate they indicated themselves. Therefore, the promotion of safely produced vegetables from Jharkhand will require large-scale provision of information about the content and purpose of a quality label.

The insights of this study on the marketing potential of vegetables from tribal Jharkhand needs to be complemented with economic studies on the actual costs of production and marketing of those vegetables to see if the price consumers are willing to pay is profitable for farmers.

Although the method to elicit willingness to pay from respondents is the most conservative as it usually results in lowest rates of willingness to pay (VENKATACHALAM 2004), respondents still had only a weak positive intention to actually purchase eggplant or cauliflower at the rate they indicated themselves. This justifies the use of the open-ended method and underlines the usefulness of additional probing with questions on respondents' intention, attitude, subjective norm, and perceived behavior control.

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