DESIGNING A CHOICE EXPERIMENT TO EVALUATE ADOPTION OF ORGANIC FARMING FOR IMPROVED CATCHMENT ENVIRONMENTAL SERVICES & POVERTY REDUCTION

Technical report for DFID FRP R8174:
"Socio-economic Opportunities from Upland Catchment Environmental Services: A Negotiation Support System"

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APPENDICES

1. Problem statement

Wide-scale use of inorganic fertilisers, pesticides and herbicides has increased agricultural production and farmer returns in developing countries over the last thirty years. This has contributed to increased pollution loads in water bodies contributing to environmental degradation, particularly water quality levels, that negatively impacts on ecological health and human health. Mechanisms to promote more sustainable land use practices include organic farming that can capture higher crop returns from certified production channels linked to national and international markets. Farmer adoption of organic farming is influenced by risk of crop failure, yield impacts, technical expertise, input supply and access to higher value, certified organic crop markets. Small-scale poor farmers are thought least likely to experiment with organic farming where risks threaten their only income stream and household food supply. Exploratory experimentation of organic farming innovations across a range of attributes of organic farming scenarios will provide guidance on which incentives and interventions will lead to adoption by different farmer groups. Scenario attributes will include land conversion to organic farming, price incentive thresholds, collective organisation choices and preferences to buy or make their own compost. Results will indicate which scenarios are most likely to reach poor farmers and provide a basis to implement incentive mechanisms for improved land use management and poverty reduction. This report documents the steps taken in designing a Choice Experiment to evaluate adoption of organic farming in the Kolans catchment. The study catchment drains into the Bhoj wetlands, which is of ecological importance as a RAMSAR site and of social significance as a principal source of drinking water for the city of Bhopal's 1. 8 million residents.

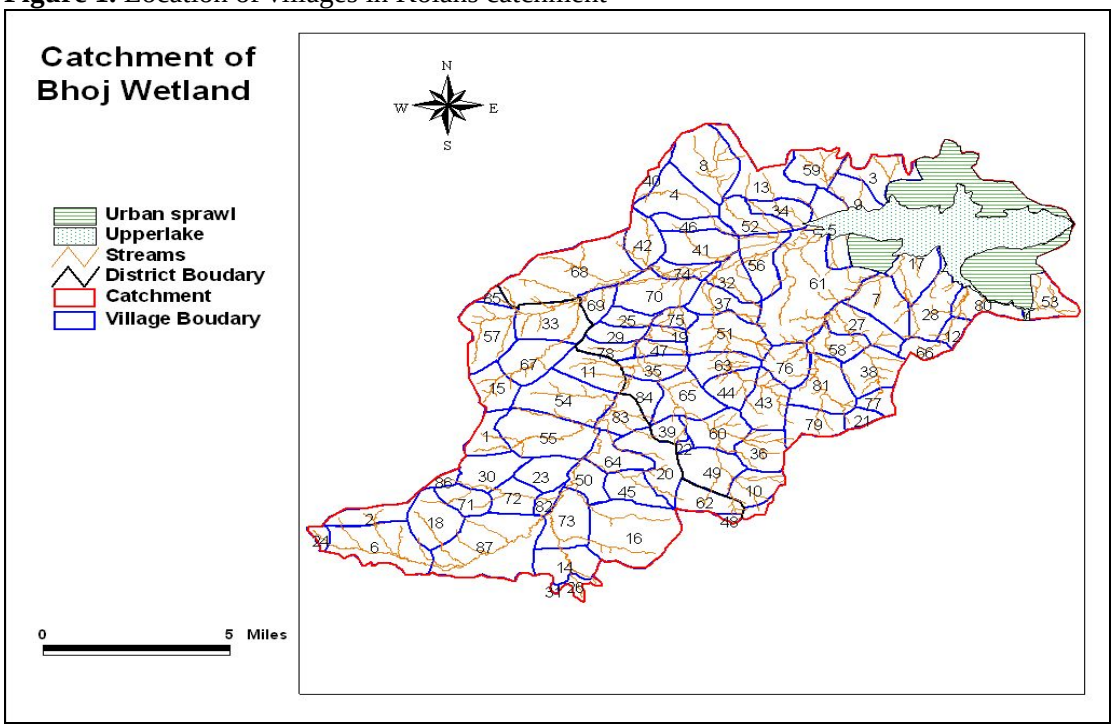
2. Study context

The Bhoj wetlands were created in the 11th century when the *Raja Bhoj of Dhar* built an earthen dam across the Kolans river. The wetlands constitute an upper and lower lake; the upper lake is the major water body and is the primary focus of this report. The upper lake measures 14 km in length and varies between 2 to 12 km in width covering a total area of 36 km^2. Average lake depth is 4 metres with the deepest point reaching 14 metres. The upper lake is classified as mesotrophic with pollution sources derived from urban and rural sources. Urban pollution is linked to the growth of state capital, Bhopal (population 1.8 million), which has developed rapidly on the borders the wetlands in the past 50 years. Urban pollution includes various industrial effluents, idol immersion, laundry houses (*dhobi ghats*), human sewage and chemical inputs for water chestnut farming. A Japanese Bank of International Cooperation (JBIC) project in the 1990s helped address many of the urban pollution issues in partnership with the Government of Madhya Pradesh (GoMP). Interventions include buffer zones between the lake and the city (forestry and roads), building over 85km of new sewage

pipes to divert 56 million litres of sewage per day, re-locating dhobi ghats away from the main lake and collaborating with GoMP to set up the Lake Conservation Authority (LCA), which acts as a state-wide resource for scientific research and policy on improved management of the state's water bodies.

Rural sources of non-point pollution from the 361 km^2 Kolans catchment also contribute to the declining health of the wetlands which supplies 40% of Bhopal's drinking water needs. Located in the *Vindhyan* range on the borders of the *Malwa* plateau, the main geological formations are *Bhander* sand stone and *Deccan* trap lava flows. This contributes to good black cotton soils and with average rainfall greater than 1200 mm and a gentle topography, agricultural is the main land use amongst the 87 villages in the catchment (Figure 1).

Figure 1. Location of villages in Kolans catchment



Following improved crop varieties linked to the Green Revolution and the Government of India's (GoI) 'Grow More Food' programme, intensity and extensiveness of cropping patterns have changed closely associated with state subsidised promotion of and access to inorganic farm inputs such as fertilisers, pesticides and herbicides. Often poor land management practices has further contributed to the transfer and transportation of inorganic compounds and sediment to the upper lake. Wider access to free electricity has increased irrigation of non-monsoon cropping (*rabi* and *zaid*), which also contributes to higher pollution loads in the upper lake and local drinking water sources. One intervention strategy that will reduce

negative environmental impacts on water quality and may secure higher farmer incomes is organic farming. While extension activities have demonstrated organic farming techniques, such as vermi-composting and improved composting of farm yard manure, uptake by farmers has been minimal. The role of other attributes in promoting a switch to organic farming requires better understanding of a) access to higher organic crop prices through certification channels, b) farmers' willingness to act collectively, c) prices of manure and d) elasticity of own labour inputs. One method that can investigate exploratory scenarios of farmer trade-offs and preferences to varying attribute levels is a Choice Experiment.

3. Why a Choice Experiment?

Choice Experiments provide an approach to evaluate the impacts, adoption or preferences of target groups to a proposed future scenario that cannot be assessed with existing knowledge (e.g. climate change, price shifts, new technology). It allows policy-makers or project managers to gain insights from target beneficiaries to alternative scenario designs to test significant but unknown predicted future events (e.g. increasing extreme weather events, new drug trials). Such techniques have been commonly used in marketing, transport economics, medicine and psychology for many years with the methodological basis, design criteria and econometric models rigorously tested and developed into a broad range of tools and modelling approaches.

In this context, a Choice Experiment is considered a relevant approach to test farmer adoption of organic farming innovations due to the uncertainty of farmer responses across different social, economic and agro-ecological conditions under different implementation strategies. Understanding what price thresholds, certification costs, input demands and own farmer labour inputs to different organic farming scenarios will allow policy-makers predict how much land is likely to be converted to organic farming permitting a more objective and defensible basis to design appropriate implementation strategies across environmental, institutional and social criteria.

4. Questionnaire design

The questionnaire is designed to capture specific data related to current farming practices with particular interest in knowledge of and level of organic farming (Appendix 1). Where applicable, questions followed protocols and coding adopted in a national farm survey conducted by the GoI in 2003. This permits comparison across State-level and all-India data. The final version of the questionnaire was translated into Hindi and back-translated into English to test for any inconsistencies or anomalies in language, sense or interpretation. The questionnaire structure consists of four sections:

- Section 1 - Household selection and data quality;
- Section 2 – Farming System;
- Section 3 – Choice Experiment;
- Section 4 – Household characteristics.

4.1 Respondent identification and data quality review

Standard locator parameters were used to identify each household. Two preliminary questions were asked to ensure the respondent qualified as a farmer responsible for land use decision-making. Codes for sample zone, respondent capability and a unique enumerator code were elicited to strengthen data management and data quality. A post-interview review by the enumerator and team leader also provides a further check on data quality or additional relevant information.

4.2 Farming system

Parsimonious information was captured on type of land holdings, use of land and farming system practices related to organic and inorganic inputs. The data was captured seasonally were relevant. Specific and detailed information was captured on existing organic practices to classify farmers and to act as baseline data to inform any future implementation strategy. A simple attempt was made to understand how farmers allocate harvested crops by use (own consumption, seeds, exchange, income, debt) across seasons.

4.3 Choice Experiment

The Choice Experiment section follows the ‘Farming System’ section to minimise respondent fatigue and to allow ‘fresh’ interaction with the voting game. The section begins with five steps that introduce the issue of chemical agricultural impacts and what shifting to organic farming is likely to entail based on key informant information in the study area. The choice experiment (or voting game) is then introduced step-by-step and respondents are requested to participate in a ‘voluntary and serious’ manner. After the symbols that relate to the attributes and levels in the experiment are carefully explained to the farmers a ‘dummy’ card is shown to test whether the farmer has clearly understood the process. One of the eight sets of eight choice cards (see Section 7.6) for analysis are only shown to the farmer after the dummy card round has been satisfactorily completed.

4.4 Household characteristics

Standard demographic data of household composition, social status, asset endowments and income sources are elicited in the final brief section. This permits disaggregation of respondents into particular poverty profile cohorts that can be determined arbitrarily or evaluated using regression methods.

4.5 Village questionnaire

Due to the wide variation in village conditions across population, infrastructure, location and land holding classes in the study catchment, a separate one page fact sheet will be captured by the team leader in each village (Appendix 2). This permits later weighting of village-level variation that may bias household-level analysis.

5. Enumerator training

Implementation of the choice experiment questionnaire was sub-contracted to the Centre for Advanced Research and Development (CARD). CARD is a Bhopal-based NGO that works in the states of Madhya Pradesh and Chhatisgarh. CARD offers specialist research services in evaluation, monitoring and policy analysis and has conducted projects for centre and state governments of India, the World Bank and DFID-India. CARD has conducted numerous village assessments using qualitative and quantitative methods and has capacity to manage large databases and conduct descriptive statistical analysis of questionnaire data.

An enumerator training workshop took place on Friday 2nd and Saturday 3rd September in Bhopal. CARD interviewed and invited eight recent university graduates from Agricultural Sciences masters programmes to attend the training as potential enumerators along with several of their own experienced staff who would be responsible for implementing the questionnaire. The training included two days intensive exposure and discussion of the questionnaire followed by three separate field visits to pilot iterations of the questionnaire and choice experiment design. Dr. Pradip Nandi, Senior Executive LCA, and his staff attended the training days and facilitated pilot visits to selected villages. The training event was chaired by Dr. Vivek Sharma, Chief Functionary CARD.

5.1 Workshop training

The training event was managed by Winrock International India (WII) and conducted in Hindi other than minor clarifications or specific explanations of the Choice Experiment by Rob Hope in English. Following introductions by all participants, WII introduced the context of the Negotiation Support System project in the context of the IIED-managed Markets for Watershed Services programme and the increased interest of innovative financing

mechanisms for integrated environment and development goals. The potential role of the project to improving farmer incomes and protecting the health of the Bhoj Wetlands as a potentially replicable approach in the state of MP and beyond was discussed and questions answered. How the questionnaire could contribute to this purpose was explained with particular emphasis on the Choice Experiment module. A brief explanation was made of how stated choice methods could contribute to improved policy understanding and more effective project implementation. A overview of the questionnaire was presented and a more detailed explanation of how the Choice Experiment module functioned. The enumerators were given a copy of the pilot questionnaire and asked to study it overnight.

Figure 2. Workshop enumerator training

The following day began with a questions and answers session to clarify aspects of the questionnaire. This was followed by a question-by-question walk through the questionnaire. After each of the four sections were completed a supervised role play was conducted with questions and answers following. Particular attention was placed on introducing, clarifying and assisting enumerators with the Choice Experiment module. In addition, special attention was paid to the issue of data quality and the need to code all entries in the questionnaire by following coding protocols to specific questions and including a four-point framework to avoid blank entries: 1) mark all zero responses (e.g. no cattle or no tractor) as “0”; 2) mark “don’t know” responses as ‘DK’; 3) mark “no response” as ‘NR’; and, 4) mark “not applicable” as ‘NA’. In this way, no cell in the data spreadsheets should be blank (see Section 8 also).

5.2 Village-level training

WII and senior CARD staff monitored the approach, quality and effectiveness of the enumerators in completing the questionnaires with farmers. Enumerators initially worked in groups of two to observe both the approach of their fellow enumerator and farmer responses.

WII provided clear guidance, support, mentoring and direction to both CARD staff and the enumerators. Initially, imperfect understanding of how to introduce and elicit responses from the Choice Experiment were common, which led to long completion times. In addition, data entry quality was variable and below the standard required.

Figure 3. Village-level training

Following entering data from pilot 1 and an enumerator debrief, a revised, simplified and common approach to introducing the Choice Experiment was explained and a 'no blanks' rule were both emphasised as the major improvements required for pilot 2. Pilot 2 resulted in a significant improvement in data entry though some enumerators still did not manage to explain the Choice Experiment effectively to some farmers. Three of the enumerators appeared to have particular difficulties which were related to an unsympathetic manner to some of the less well-educated farmers and a tendency to 'give-up' if the respondent did not grasp the approach quickly. Extra support and mentoring was provided to these enumerators and CARD were instructed to be particularly vigilant of their work.

The third and final pilot only tested the revised Choice Experiment module. With a shorter questionnaire enumerators and farmers seem to have more energy and increased satisfaction and enjoyment was noted by everyone. Accordingly, the Choice Experiment module was moved forward in the questionnaire with the socio-demographic module relegated to the final part. The revised design and increased familiarity and confidence with the Choice Experiment approach contributed to shorter completion times than before. Following a final debrief, minor changes in the general questionnaire were noted and the final Choice Experiment design was agreed.

6. Pilot design, testing and analysis

The questionnaire was piloted in three separate field trials in different catchment villages with three different versions tested. This was an iterative and collaborative process with farmers,

enumerators, the LCA, CARD and secondary stakeholders involved in organic farming contributing to revisions that informed the final design. Questions were reduced to the minimum required for the purpose of this study in order to reduce administration time and allow greater focus on the choice experiment part. A critical objective in the pilot phase was to identify and crystallise the most relevant attributes and levels that would contribute to farmers shifting to organic farming. Revisions were largely informed by the qualitative understanding of the enumerators, project team and farmers' feedback, however the choice data were also entered into NLOGIT software and analysed to provide limited understanding of which attributes were influencing farmer choices. This analysis is reported here though caution should be taken with these results due to the small sample sizes available.

6.1 Choice pilot 1 (Sunday 4th October)

The full questionnaire was administered in two villages. The objective of the first pilot was to both familiarise the enumerators and team leaders with the questionnaire and to gain insights into which attributes and levels in the choice experiment were influencing farmer voting preferences. Survey implementation took between one and two hours depending on the enumerator and the ability of individual farmers to grasp the concept of the choice experiment. Unfamiliarity with the questionnaire created excessive time collecting some of the more general data. Enumerators more adept at explaining the choice experiment were generally recorded the shortest completion times.

One aspect of the design that is consistent across all pilot versions is the uniform application of levels of land committed to organic farming (25%, 50%, 75%, 100%). The reason for this aspect in the design is to explore which attributes are likely to influence different land conversion to organic production. This will permit objective guidance on which attributes and levels are most significant in promoting organic farming in the study catchment. One method of analysing these data is to evaluate the elasticity (or responsiveness) of changes in continuous attributes (price or labour) to the four different organic land use options identified. This will indicate what level of organic farming uptake is likely to be realistic to inform specific and realistic targets for implementation. As such, the land conversion to organic farming is not analysed in the following results tables. Choice experiment attributes and levels for Pilot 1 are indicated in Table 1.

Table 1. Attributes and levels in Pilot 1

Attributes	Levels			
Land committed to organic farming	25%	50%	75%	100%
Organic crop price increase	0%	10%	20%	30%
Organic price guarantee	Yes		No	
Cost of 2 tonne trolley of compost manure	R1000 to R2750 in R250 increments (i.e. 8 value options)			
Minutes spent own-composting per day	4	6	8	10

Analysis of the results from 73 valid observations (less than 10 farmers) are presented in Table 2. In accordance with observation of farmer prioritisation in choosing the preferred option, increases in organic crop price strongly influence which option was chosen. This was closely followed by a price guarantee (similar to the existing Minimum Support Price that applies to soybean, rice and wheat). Cost of organic manure was presented at higher levels than current local prices to reflect likely price increases from increased demand and insufficient supply locally. Though these costs are considerably higher than the R400-600 local cost of a two tonne trolley, this attribute was insignificant in the analysis. Finally, while higher labour costs of own-production resulted in an expected negative coefficient, the relative value was so small that is appears to have been equally discounted by farmers, who are most strongly influenced by access to increased prices.

Table 2. Multinomial regression results from Pilot 1 (73 observations)

Variable	Coefficient	Standard error	b/St.Er. [P(Z)>z]
Organic price	12.90	2.96	4.36*
Price guarantee	4.66	0.86	5.44*
Compost price	0.00	0.00	-0.58
Labour	-0.40	0.11	-3.61*

*significant at the 1% level.

6.2 Choice pilot 2 (Tuesday 6th October)

After collaborative discussion of the outcome of Pilot 1, a number of adjustments were considered for testing:

- Increase the range of organic price levels to reduce price ‘jumps’;
- Introduce a realistic cost of certifying organic produce in order to access higher market prices. This includes a realistic price differential between individual and collective action;
- Lower manure costs to a range slightly higher than current local prices;

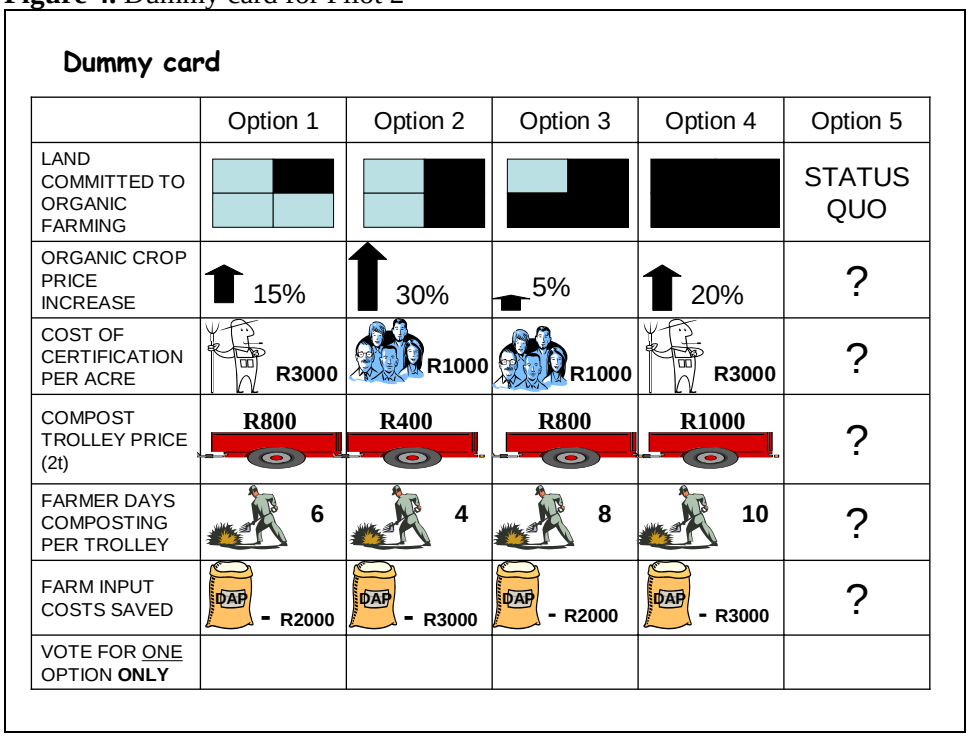
- Introduce a range of cost savings from switching to organic only farming (i.e. fertilisers, pesticides and herbicides) (Table 3).

Table 3. Attributes and levels in Pilot 2

Attributes	Levels					
Land committed to organic farming	25%	50%	75%	100%		
Organic crop price increase	5%	10%	15%	20%	25%	30%
Cost of organic certification per acre	Individual (R3000)		Group (R1000)			
Cost of 2 tonne trolley of compost manure	R400	R600	R800	R1000		
Input cost savings (fertilisers) per acre	R2000		R3000			
Minutes spent own-composting per day	4	6	8	10		

As noted, attributes and levels were presented to farmers in simple symbols to aid understanding and participation. The dummy card for pilot 2 is shown in Figure 4.

Figure 4. Dummy card for Pilot 2



A number of lessons emerged from reviewing qualitative feedback from testing Pilot 2 in association with the results from the quantitative data analysis. First, the revised pilot often tended to result in farmers working out the sums of the various scenarios, which, though understandable and realistic, limited the potential of the experimental approach. Second, the

addition of a further attribute caused cognitive complexity for some farmers, increasing the time taken for completion and stretching some farmers' patience. Third, price again dominated response patterns highlighting the significance of price shifts influencing farmer behaviour (Table 4). Fourth, it was believed that the input costs saved attribute could not be accurately estimated and therefore could have resulted in farmers discounting it in preference to exogenous variables outside their control (i.e. crop prices). This presented a methodological challenge that reflected earlier concerns that though price was likely to be one of the key incentives for land use change, it may dominate all other endogenous considerations (i.e. labour, land conversion).

Table 4. Multinomial regression results from Pilot 2 (124 observations)

Variable	Coefficient	Standard error	b/St.Er. [P(Z)>z]
Organic price	9.61	1.45	6.64*
Certification	0.00	0.00	-5.94*
Compost price	0.00	0.00	-2.75*
Labour	-0.04	0.05	-0.93
Input savings	0.00	0.00	2.40**

*significant at the 1% level; significant at 5% level.

6.3 Choice pilot 3 (Thursday 8th October)

Based on experience from the first two pilots, two revised experimental formats were piloted in the final phase of testing. The important difference between the two final pilot designs was that one included a crop price attribute (Table 5) and the other design excluded prices. In addition, input costs saved from converting to organic, likely yield decreases following organic conversion in years 1 and/or 2 and crop price increase were labelled on each choice card to encourage farmers to consider these impacts across all eight choice cards. This was thought to better reflect where interventions could respond to farmers' preferences and where factors would be largely outside the influence of any project (e.g. yield reduction, input cost savings).

The results from the two pilots are presented in Tables 5 and 6. Qualitative assessments of the revised designs indicated that the simpler format was more accessible though price again dominated response patterns. The econometric analysis has to be approached with great caution due to the limited sample size and the danger that presenting results in this beguilingly objective fashion carries more weight than is merited. It was decided to base the final design on the qualitative experiences of the three pilot exercises though acknowledge that price was clearly the pivotal attribute for farmers. It was noted that the objective of the study was not to identify a competing attribute to price but to evaluate identified attributes

and levels that would influence different levels of land conversion to organic farming in the study catchment. If price dominated everything else then this was an important and valid finding; the value of the choice experiment would be to allow objective understanding of what price levels would influence different levels of land conversion to organic farming.

Figure 5. Attributes and levels in Pilot 3

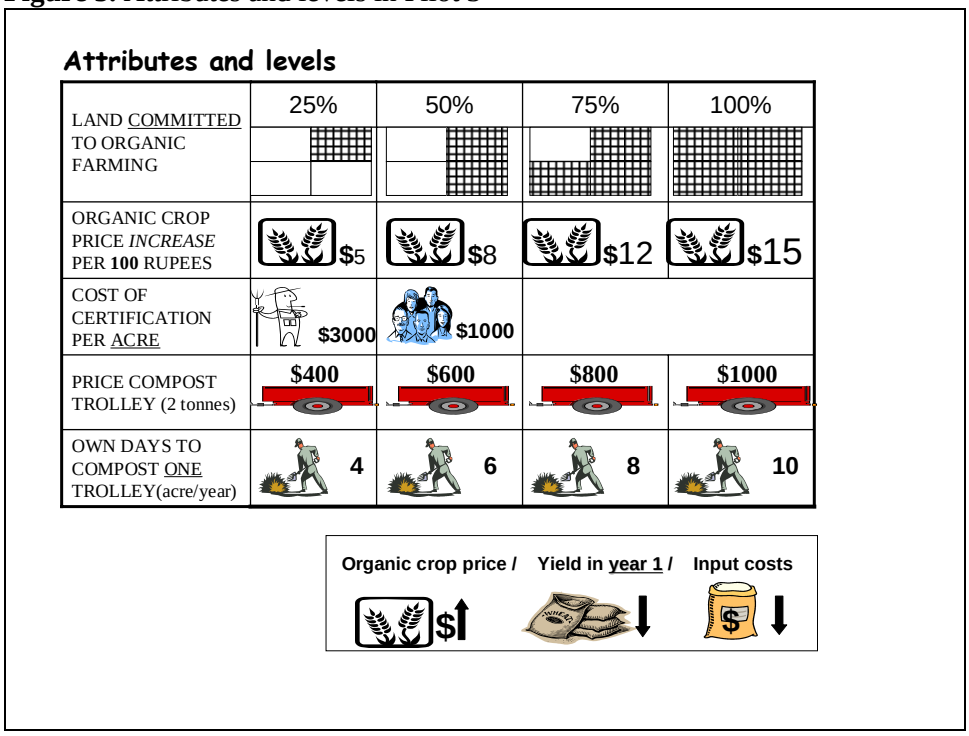


Table 5. Multinomial regression results from Pilot 3a (71 observations)

Variable	Coefficient	Standard error	b/St.Er. [P(Z)>z]
Organic price	32.72	8.63	3.79*
Certification	0.00	0.00	-5.78*
Compost price	0.00	0.00	-2.71*
Labour	-0.23	0.00	-2.97*

*significant at the 1% level; significant at 5% level.

Table 6. Multinomial regression results from Pilot 3b (88 observations)

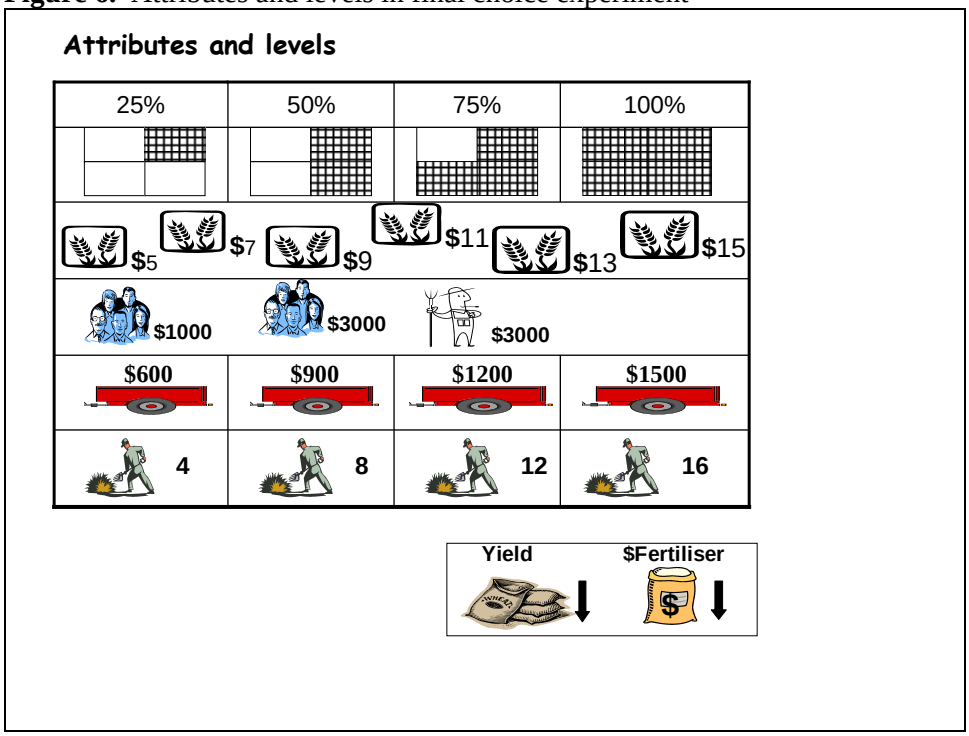
Variable	Coefficient	Standard error	b/St.Er. [P(Z)>z]
Certification	0.00	0.00	-6.19*
Compost price	0.00	0.00	-3.56*
Labour	-0.18	0.07	-2.49**

*significant at the 1% level; significant at 5% level.

After further discussions with the institutes which are likely to commission a pilot trial of organic farming, the final attributes and levels were chosen (Figure 6). While organic price increases are expected to be a significant consideration for farmer adoption preferences, it

was decided to widen the range of prices in smaller increments of R2 from a R5 increase to a maximum of R15 (six in total). These prices fell below current prices achieved in certified organic markets. In this way, farmer expectations would not be unrealistically raised. Another change was to introduce a third level to the certification cost attribute. This was due to the belief that many farmers were voting on cost alone and not whether to work as a group or individually. Accordingly, a third variable offered a second group attribute at the same higher individual cost level of R3000. It is believed this will disentangle embedding problems in the trade-off between certification financial cost and collective organisation preferences. It is anticipated that small-scale farmers dependent on agriculture will prefer the security of working collectively while larger land-holding farmers, who may be better educated or with alternative non-farm income sources, may opt to work alone given no price differential. The manure cost attribute was slightly revised upwards to reflect the likely scarcity of manure with wider organic farming adoption. Finally, labour days composting were also revised slightly upward to attempt to tease farmer substitution effects between buying compost or making their own. This will then allow a better understanding of appropriate intervention activities for particular farmer groups.

Figure 6. Attributes and levels in final choice experiment



7. Sampling frame and sampling strategy

Sampling frame design was informed by existing research by the LCA in eight communities in the riparian, peri-urban area within Bhopal Municipal Corporation and a need to better understand adoption of organic farming along a continuous river system from upstream, rural and remote villages to downstream villages within a reasonable proximity of the wetlands. A sampling strategy that captured a broad cross-section of villages across the Kolans catchment is considered to be more representative than a more intensive sampling approach in fewer villages due to the socio-economic and agricultural heterogeneity across the catchment.

7.1 Sampling frame

The sampling frame operates on three hierarchical levels:

a) Sampling zone;
b) Village-level;
c) Within village groups of particular interest.

7.2 Sampling zones.

Three sampling zones have been selected:

i) **BMC** – Bhoj Municipal Corporation. Villages located in the riparian zone of the Bhoj wetlands within the BMC District and in a peri-urban area;
ii) **LOWK –** Lower Kolans catchment. Villages located in the lower catchment area of the Kolans river near the Bhoj wetlands;
iii) **UPK –** Upper Kolans catchment. Villages located in the upper catchment area of the Kolans river in a rural and remote setting.

7.3 Village selection

Village selection within the three sampling zones was informed by a range of criteria:

- Villages in the BMC zone fell in a riparian cluster;
- Villages in the UPK zone were located on the main Kolans river and/or were located on tributary intersections;
- Villages in the LOWK zone were located near the upper lake shore close to the Kolans river;
- A discernible border separated the UPK and LOWK village clusters;
- Total village land area was relatively high within the sampling zone;

- Current cultivated land in the village was relatively high within the zone;
- Percentage of agricultural village land was roughly 50% or greater;
- Village households dedicated to cultivation was relatively high;
- There was representation of SC and ST households across the study catchment.

Villages selected to be sampled are indicated in table 7.

Table 7. Sample frame for Choice questionnaire

ID	ZONE	VILLAGE	Sample size (farmer households)	No. of Sets (units of 8)	SC?	ST?
5	BMC	Bamhori	8	1	☐	☐
7	BMC	Barkheda Nathu	48	6	☒	☒
17	BMC	Bishan Khedi	48	6	☒	☐
27	BMC	Gol Khedi	24	3	☐	☐
28	BMC	Goria	8	1	☐	☐
61	BMC	Mugaliyachhap	56	7	☒	☐
80	BMC	Sewaniya	8	1	☐	☐
		sub-total	***200***	***25***		
32	LOWK	Int Khedichhap	32	4	☒	☒
37	LOWK	Kajlas	32	4	☐	☐
41	LOWK	Khajoori Sadak	64	8	☒	☒
52	LOWK	Kolu Khedi	32	4	☒	☒
70	LOWK	Pipaliya Dhakad	40	5	☒	☒
		sub-total	***200***	***25***		
16	UPK	Bilkisganj	48	6	☒	☒
23	UPK	Dhabla	48	6	☒	☐
54	UPK	Kulas Kalan	48	6	☒	☐
55	UPK	Kulas Khurd	48	6	☒	☐
87	UPK	Uljhawan	48	6	☒	☒
		sub-total	***240***	***30***		
		Total	***640***	***80***		

7.4 Particular interests groups.

a) **Scheduled caste/Scheduled tribe**. While farmers are the primary interest group for this questionnaire, scheduled caste (SC) or scheduled tribe (ST) households will be over-sampled in villages where they are more commonly represented. This is indicated by a 'crossed' box in table 7. This is to be consistent with the poverty reduction focus of the study.

b) **Female-headed**. Purposively sampling of female-headed farmer households in each village is requested.

c) **Land holding classes**. Team leaders are instructed to sample small, medium or large farmers in each village to capture a representative sample of land holding classes across villages and the wider study catchment.

7.5 Sampling strategy.

Sampling within the village should attempt to be as random as possible within the purposive constraints indicated above. Team leaders are instructed to be opportunistic in sampling farmers who volunteer but ensure that farmers are sampled across the village and not only those that may be more entrepreneurial, inquisitive or members of a village elite that are more easily encountered on arrival. Given the complicated and multiple sampling criteria already specified and the experience of fieldwork in the study area, CARD team leaders are instructed to fulfil this requirement pragmatically and sensitively in each village.

7.6 Questionnaire choice sets

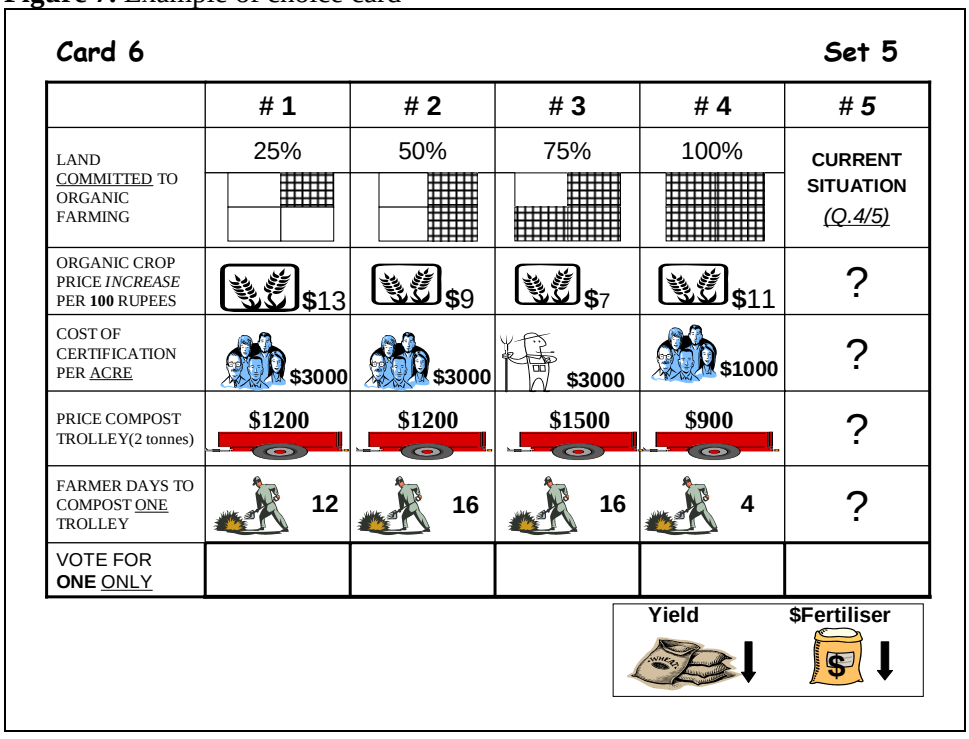
An important feature of the questionnaire is the need for implementation to be rotated in units of eight. The reason for this requirement follows the attribute and attribute levels determined in Figure 6. The attribute levels result in a 4^3*6*3 factorial design with effects and degrees of freedom (df) decomposed to:

- Main effects (16 df);
- Two-way interactions (100 df);
- Other interactions (1035df = 1152 – 16 – 100 – 1).

Running the mains effects orthogonal design function in SPPS (version 11.5) resulted in a 64 card design with 8 cards repeated. Eliminating duplicate cards would reduce orthogonality and the cards are left in the design. As indicated, the four attribute levels for land conversion to organic farming remain consistent across all cards along with the ‘status quo’ option. To test all choice cards against each land conversion level, each respondent is given 8 choice profiles to ‘vote’ on. To test each of the 64 choice cards, 8 questionnaire sets are designed, e.g. 8 cards per respondent with a total of 8 sets equal to 64 cards. Each card is placed systematically in the 25% land conversion column, i.e. in card 1/set 1, choice card 1 is placed against 25% land conversion, in card 2/set 1, choice card 2 is placed against 25% land conversion; card 9 is placed in 25% land conversion in card 1/set 2; this continues until the 64^{th} card is placed in card 8/set 8. A simple rotation format then allocates the n^{th} + 1 card in the adjacent and higher land conversion column, where n is a factor of 8. For example, in set 1, the choice card in 50% land conversion commences with choice card 9; 75% conversion begins with choice card 17; and, 100% conversion starts with the 25^{th} choice card. In this way, each choice card appears in each of the final 64 choice card profiles with no repetition. The full choice card list appears in Appendix 4 and an example of one of the 64 choice profiles is illustrated in Figure 7.

Enumerate team leaders have been instructed to attempt to sample in units of 8 respondents to be consistent with the design of the choice experiment. The number of 'sets' (households divided by 8) is also indicated (see Table 7). Team leaders are instructed to manage the distribution of the 8 questionnaire sets to enumerators to simplify this procedure, i.e. each enumerator is required to complete a full set of 8 questionnaires (marked 'SET 1' to 'SET 8') before a further set is released. The aim is to reduce potential confusion in the field and permit a more thorough statistical analysis.

Figure 7. Example of choice card



8. Data management and monitoring

Data management and data quality monitoring are critical components in achieving accurate and reliable results. While every effort is made to support and improve data elicitation from farmers, it is equally important that data are managed, inputted and checked to ensure the experimental design is not prejudiced. Three approaches are used to reduce data management errors.

8.1 Pre-coded data spreadsheets

Given the relative complexity of the survey design, three pre-coded MS excel spreadsheets were designed and discussed with CARD's data manager. Household data that had a pre-designed coded response were inputted into the household spreadsheet with 'drop-down' boxes that provided a discrete and controlled input option. For example, the social status

question resulted in four options appear in a column box when the cell was highlighted: ‘scheduled caste’, ‘scheduled tribe’, ‘other backward caste’ and ‘other’. Similarly, all possible entries were coded to assist optimal and accurate data entry. A similar format was applied for the short village questionnaire. A separate MS excel file was created with eight spreadsheet sections for the Choice Experiment responses. Each spreadsheet was clearly labelled ‘set 1’ through ‘set 8’ and colour-coded. The rotational format of the design permitted easy entry of attributes and attribute levels in a format that allowed simple transfer for analysis in the NLOGIT econometric software. The only inputs required were the choices per each card (‘0’ or ‘1’ format), the sample zone (pre-coded) and the unique identity number of the respondent by letter, date and survey number. For example, an enumerator called Monica may be assigned the letter ‘M’ and administer a Set 1 questionnaire on 20th September, this would be uniquely coded “**M-2009-01**”. This allows later comparison across data sets.

8.2 Random data quality checks

A random data quality check of one in ten questionnaires will be performed by CARD on a weekly basis with an additional random check by WII. If any significant errors are found that indicate the data entry protocol has not been adequately followed, all data will be re-entered.

8.3 Update from

In order to monitor progress and highlight any significant difficulties in field implementation, a weekly questionnaire update form will be sent from CARD to WII (Appendix 5). This provides a clear communication channel to identify and discuss uncertainties, unforeseen events and maintain regular assessment of progress against agreed targets.

9. Institutional collaboration and policy uptake

The design, development and implementation of the Choice Experiment has benefited from direct and close collaboration with government institutions responsible for and promoting organic farming in MP. In particular, the Lake Conservation Authority and the Rajiv Ghandi Mission for Watershed Development are both investigating new approaches and mechanisms to encourage wider adoption of organic farming across the state on both developmental and environmental criteria. WII has a long-established good working relationship with the ‘end users’ of the development research in MP, which has contributed to the design phase of the Choice Experiment being well-informed and responding to specified government and civil society needs. It is believed that the experimental results will contribute to policy uptake within a planned pilot scheme in the near future. This is evidenced by an invitation to present the results of the Choice Experiment at a one day ‘Incentive-based Mechanisms for Watershed Services’ workshop in Bhopal in later November 2005, hosted by the Executive

Director (name) of the LCA and including all relevant government departments. It is also important to note that the excellent partnership with CARD also provides important dissemination pathways of the research and developmental implications into both government and civil society institutions, including the DFID-India Madhya Pradesh Rural Livelihoods Programme and World Bank rural development programmes, for which CARD is contracted as a key collaborator and implementing agency in MP and Chhatisgarh.

APPENDIX 1. HOUSEHOLD QUESTIONNAIRE

Choice experiment
- household questionnaire (SET 1)

Introduction to respondent:

"We are conducting a farm survey in this area. The survey is investigating ways to improve farmer livelihoods and the environment. All information collected is completely ***confidential****.*

Accurate information will improve the quality of any recommendations.

Your time and assistance is greatly valued. Thank you very much."

SECTION 1. HOUSEHOLD SELECTION AND DATA QUALITY

1.1 IDENTIFICATION OF SAMPLE HOUSEHOLD	
Village: ……	Date: …….. (day)
Block: ……	……. (month)
District: ……..	Sample code[1]: ……
Name of respondent:……	Response code[2]: ……..
Gender of respondent : Male ☐ Female ☐	Enumerator code: ……/……/…… (letter) (date) (number)
Do you farm any land? Yes ☐ No ☐	
Are you responsible for farm decision-making? Yes ☐ No ☐	

[1]Sample code – **BMC** (Bhopal Municipal Corporation riparian zone); **UPK** (Upper Kolans catchment); **LOWK** (Lower Kolans catchment).
[2] Response code – (1) co-operative and capable; (2) co-operative but <u>not</u> capable; (3) busy; (4) informant reluctant; (5) other.

1.2 POST-INTERVIEW DATA REVIEW
1. Total time taken to complete interview : ……. minutes
2. Enumerator remarks on any difficulties or omissions in the interview:
3. What action was taken by the enumerator to specific problems:
4. Remarks by team leader in relation to points (2) and (3): Signature …….. (enumerator) Date …… …… (team leader) Date ……..

SECTION 2. FARMING SYSTEM

2.1 LAND MANAGEMENT

			With papers	Without papers
1.	Type of land owned (**acres**)	a) Total land owned (**all**)		
		b) Land owned and cultivated		
		c) Land owned and leased out		
		d) Land owned and not cultivated		
		e) Land leased-in for cultivation		
		Total land cultivated (**b+e**)		

			Kharif	Rabi	Zaid
2.	Area cropped (acres)				
3.	Area irrigated (acres)				
4.	Area farmed only with compost manure (acres)				
5.	Area farmed only with farm yard manure (acres)				
			Kharif	Rabi	Zaid
6.	Fertilisers (**kg** per season)	Urea			
		DAP			
		Super phosphate			
		Other			
7.	Pesticides and herbicides (**litres** per season)	Name 1 (…….)			
		Name 2 (……..)			
		Name 3 (……..)			
8.	Where do you usually purchase fertilizers, pesticides, herbicides, etc. from?[1]				
			Kharif	Rabi	Zaid
9.	Organic manure/ bio-fertilizers (**trolley**)	Farm yard manure			
		Compost			
		Vermi-compost			
		Other (name ……...)			
		Total land **applied** (acres)			
10.	Bio-pesticides	*Please name (if any):*			

11.	What proportion of your dung do you use for…	Dung cakes	Farm yard compost	Compost	Other

12.	In the last year, did you …	Dung (Trolley)	Farm yard manure (Trolley)	Compost (Trolley)	Vermi-compost (Quintal)	Poultry waste (Quintal)	Other (unit?)
	… buy						
	… sell/exchange						
	… give						

13.	Do you buy farm inputs ….	….by cash?		
		…. by credit?		
		… other?		
14.	What is your usual method of ploughing?[2]			
15.	What is your main source of irrigation?[3]	Kharif	Rabi	Zaid

16.	What <u>percentage</u> of the last harvest crops were …		Kharif	Rabi	Zaid
		…eaten by the home?			
		…seeds stored for the future?			
		…exchanged (no money)?			
		…sold for household income?			
		…sold/given to repay debt?			
		…lost/left/stolen/other?			
		*Total by <u>season</u>**			

CODE:
[1] – (1) local supplier; (2) open market; (3) Mandi market; (4) other.
[2] – (1) Animal power; (2) Tractor; (3) Other
[3] – (1) Tube well; (2) Well; (3) Tank; (4) Reservoir; (5) Canal; (6) River/spring; (7) Other
* This must add to 100% , it is important point is to be as accurate as possible.

<u>Enumerator notes and space for farm land diagram:</u>

SECTION 3. CHOICE EXPERIMENT

Carefully introduce this section to the farmer as "*a method to test possible future scenarios that aim to benefit the farmer and the environment*". Before showing the choice cards to the farmer the enumerator must:

1. **Explain impacts of chemical agriculture on the environment (3.1);**
2. **Explain what shifting to organic farming implies (3.2);**
3. **Explain the voting game approach (3.3);**
4. **Explain voting is a 'voluntary and serious' exercise (3.4);**
5. **Test a dummy choice card (3.5).**

3.1 Impact of chemical agriculture: Use of chemicals fertilizers and pesticides have increased in recent years. While their use has contributed to higher crop yields, their price has also increased over time. In addition, there are negative environmental impacts of using chemical farm inputs on the environment, particularly water resources. In this area, fertilizer and pesticide residues accumulate in the soil, enter into ground water systems, and flow into the Upper Bhoj lake. This affects the health of the soil, quality of food, and, importantly, drinking water supplies locally and in a wider area.

3.2 Shifting to organic agriculture implies that you, the farmer:

- Don't apply chemical fertilizer and pesticides (and save on purchasing them)
- Apply compost of various types – Farm Yard Manure, Bhu- NADEP, Vermi-compost etc. You may make the compost yourself, or buy some of the raw materials, e.g. dung, or buy prepared compost.
- Apply organic methods of pest control – bio-pesticides etc
- May be able to access higher prices from the market by certifying organically-grown farm and crop produce.

3.3 Voting Game: In this experiment (or voting game) we will give you eight different organic farming scenarios. Each scenario will contain five options and each option will have information on five factors relevant to converting to organic farming.

- Please vote for only <u>one</u> of the five options.
- If you don't like options 1-4, choose the current situation (Option 5).
- Please note a vote implies that in the given scenario you would try composting for at least <u>ONE</u> year.
- The **purpose** of this exercise is to determine what factors are important to farmers and inform the design of interventions beneficial for the farmer and the environment.

3.4 Voluntary and Serious responses: This is a voluntary exercise. We request you to consider your situation and the options given and give serious responses. Any interventions/changes to crop prices and availability and prices of organic manure will be subject to regular monitoring and evaluation of farmers' commitments being honoured.

3.5 Dummy card testing; The dummy card provides an opportunity to see if the respondent has really understood the experimental design. Ask the respondent to vote on the 'dummy' choice card below. If the respondent has chosen randomly or is unable to explain the choice as being beneficial to his/her particular circumstances then there may have been a lack of understanding of the method or the respondent is unwilling to participate meaningfully.

Clarify if there is any misunderstanding or respondent resistance <u>before</u> preceding to showing the eight choice cards.

SECTION 4. HOUSEHOLD CHARACTERISTICS

2.1 HOUSEHOLD ASSESSMENT							
1.	Social group[1]		**6.**	Drinking water access		Main Source[6]	Distance[7]
2.	Religion[2]						
3.	Household dwelling code[3]				a) July-Feb		
4.	Dwelling condition[4]				c) Mar-June		
5.	Household sanitation access[5]		**7.**	How many household members have had diarrhoea in the last 30 days?	a) Under 5 years		
					b) Over 5 years		

CODES:
[1] – (1) Scheduled tribe; (2) Scheduled caste; (3) Other backward caste; (4) Other.
[2] – (1) Hindu; (2) Muslim; (3) Sikh; (4) Christian; (5) Other
[3]– (1) Owned; (2) Hired; (3) Other.
[4] – (1) Pucca; (2) Semi-pucca; (3) Kaccha.
[5]– (1) Open field (2) Single pit (no water); (3) Flush toilet; (4) Other
[6] – (1) Tap – public supply ; (2) Tap – own supply (3) Tubewell or handpump; (4) well; (5) tank or pond reserved for drinking; (6) other tank/pond; (7) River/canal/lake; (8) Spring; (11) Tanker; (12) Other.
[7] – (1) In the house; (2) < 500 metres (d) > 500 metres.

2.2 HOUSEHOLD ASSETS		
	Yes	No
...electricity?	☐(1)	☐(0)
...radio?	☐(1)	☐(0)
...television?	☐(1)	☐(0)
...cell phone?	☐(1)	☐(0)
…tractor?	☐(1)	☐(0)
…water pumping set?	☐(1)	☐(0)
…VCD?	☐(1)	☐(0)
...bicycle?	☐(1)	☐(0)
...motorcycle/ scooter?	☐(1)	☐(0)
...thresher?	☐(1)	☐(0)
...bullock cart?	☐(1)	☐(0)
...winnower?	☐(1)	☐(0)
…sewing machine?	☐(1)	☐(0)
…tubewell?	☐(1)	☐(0)
…bio gas?	☐(1)	☐(0)
…pressure cooker?	☐(1)	☐(0)
…number of bullocks?		
…number of buffalo?		
…number of cows?		
…number of goats?		
…number of chicken?		
…number of pigs ?		

2.3 SOCIO-DEMOGRAPHIC CHARACTERISTICS

No.	Name (over 7 yrs only)	Gender Male (1) Female (2)	Age	Education code[1]	Engaged in farming in last year Yes (1), No (0).	Estimated income from last year (Rupees)			
						Cultivation	Livestock	Wage labour	Other
1	(**Head of HH**)								
2									
3									
4									
5									
6									
7									
8									
9									
10									

CHILDREN UNDER AGE OF 7 YEARS		
11	Number of female children under 7 years	
12	Number of male children under 7 years	

CODE –

[1] – (1) Illiterate; (2) Literate without formal schooling; (3) Literate below primary; (4) Primary; (5) Middle; (6) Secondary; (7) Higher secondary; (8) Diploma/certificate; (9) Graduate; (10) Above.

APPENDIX 2. VILLAGE QUESTIONNAIRE

Choice experiment
- village questionnaire

1.1 VILLAGE IDENTIFICATION	
Village name: …….	Date: _ _ _(day) _ _ _ _ _ _(month)
Block: …….	Sample code[1]:…….
District: ……..	Response code[2]: ……..
Name of respondent:……	Enumerator code: _ _ _ _ _ _ _ _ _
Position in village ……	

[1] Sample code: **BMC** (Bhopal Municipal Council); **UPK** (Upper Kolans); **LOWK** (Lower Kolans).
[2] Response code – (1) co-operative and capable; (2) co-operative but not capable;
(3) busy; (4) informant reluctant; (5) other.

1.2 VILLAGE CHARACTERISTICS	
1. Total households in village	……households
2. Total village population	……people
3. SC/ST or OBC households in the village	**SC** ☐ **ST** ☐ **OBC** ☐
4. Households by land holding in the village	**Landless** ☐ **Marginal farmers (<2 acres)** ☐ **Small farmers (2-5 acres)** ☐ **Medium farmers (5-10 acres)** ☐ **Large farmers (>10 acres)** ☐
5. Does the village have electricity?	**Yes** ☐ **No** ☐
6. Does the village have a (land-line) telephone connection?	**Yes** ☐ **No** ☐
7. Is there piped water access to the village?	**Yes** ☐ **No** ☐
8. Does the village have a primary school?	**Yes** ☐ **No** ☐
9. Does the village have a middle school?	**Yes** ☐ **No** ☐
10. Does the village have a high school?	**Yes** ☐ **No** ☐
11. Does the village have a post office?	**Yes** ☐ **No** ☐
12. What is the condition of the main access road to the village?	**Pucca** ☐ **Semi-pucca** ☐ **Kutcha** ☐
13. What is the estimated distance to Bhopal?	**……..km**
14. Is there a daily bus to Bhopal from the village?	**Yes** ☐ **No** ☐
15. How long does it take to travel to Bhopal by public bus?	……minutes
16. Does the village have a cooperative society?	**Yes** ☐ **No** ☐
17. If no, how far is the nearest cooperative?	**…….km**
18. Does the village have a regular market?	**Daily** ☐ **Weekly** ☐ **Other/No** ☐
19. Is there a cowshed (*goshala*) in the village	**Yes** ☐ **No** ☐
20. Has there been any compost (of any 'improved' type – please note*) extension training for the farmers in the village?	**In the last year, yes** ☐ **In the last five years, yes** ☐ **No** ☐

APPENDIX 3. Socio-economic indicators for village sample frame

ID	ZONE	VILLAGE	HH_01	POP-01	P_SC	P_ST	CULT	AREA	IRR	RFD	CLAND	%AGRI	%IRRIG
5	BMC	Bamhori	22	131	0	0	28	222	3	40	43	19	1
7	BMC	Barkheda Nathu	343	1863	323	169	229	699	150	305	608	87	21
17	BMC	Bishan Khedi	253	1434	379	0	299	653	41	452	493	75	6
27	BMC	Gol Khedi	62	380	27	15	102	122	20	86	107	88	16
28	BMC	Goria	20	112	0	0	51	461	0	24	24	5	0
61	BMC	Mugaliyachhap	556	3165	692	10	509	1322	90	651	741	56	7
80	BMC	Sewaniya	18	103	16	0	18	109	43	47	90	82	39
32	LOWK	Int Khedichhap	108	776	67	47	248	483	6	297	303	63	1
37	LOWK	Kajlas	92	535	27	1	107	331	5	173	178	54	2
41	LOWK	Khajoori Sadak	314	1927	343	41	261	347	4	192	196	57	1
52	LOWK	Kolu Khedi	95	497	134	21	69	487	35	105	140	29	7
70	LOWK	Pipaliya Dhakad	104	693	64	35	114	430	61	322	383	89	14
16	UPK	Bilkisganj	777	4504	887	245	360	1022	53	725	778	76	5
23	UPK	Dhabla	183	1026	179	6	190	390	111	232	343	88	28
54	UPK	Kulas Kalan	224	1617	200	6	507	684	304	305	610	89	44
55	UPK	Kulas Khurd	161	1065	90	0	126	619	234	308	542	88	38
87	UPK	Uljhawan	518	2943	503	158	532	1292	286	694	980	76	22

Legend: Zone – BMC (Bhopal Municipal Council); LOWK (Lower Kolans); UPK (Upper Kolans);
HH-01 – Total village households 2001; POP-01 – Village population 2001; P_SC – Scheduled caste population; P_ST – Scheduled tribe population; CULT – Number of cultivators; IRR – irrigated land; RFD – rainfed land; CLAND – total cultivated land (including 'cultivated waste' and 'not cultivated'; %AGRI – percentage agricultural land; %IRRI – percentage cultivated land irrigated. (Source: GOI 2001 national census)

APPENDIX 4. Choice card orthogonal design

Card 1 organic price increase 5% Certification $3000 Group Price of compost trolley 900 Labour days per trolley 12	Card 9 organic price increase 5% Certification $1000 Group Price of compost trolley 600 Labour days per trolley 8	Card 17 organic price increase 9% Certification $1000 Group Price of compost trolley 1500 Labour days per trolley 4	Card 25 organic price increase 15% Certification $1000 Group Price of compost trolley 1500 Labour days per trolley 16
Card 2 organic price increase 11% Certification $3000 Individual Price of compost trolley 1500 Labour days per trolley 12	Card 10 organic price increase 7% Certification $3000 Individual Price of compost trolley 900 Labour days per trolley 4	Card 18 organic price increase 7% Certification $3000 Individual Price of compost trolley 1200 Labour days per trolley 4	Card 26 organic price increase 15% Certification $1000 Group Price of compost trolley 1500 Labour days per trolley 12
Card 3 organic price increase 15% Certification $3000 Group Price of compost trolley 600 Labour days per trolley 16	Card 11 organic price increase 5% Certification $1000 Group Price of compost trolley 600 Labour days per trolley 8	Card 19 organic price increase 5% Certification $1000 Group Price of compost trolley 1200 Labour days per trolley 12	Card 27 organic price increase 9% Certification $3000 Group Price of compost trolley 600 Labour days per trolley 8
Card 4 organic price increase 7% Certification $1000 Group Price of compost trolley 1200 Labour days per trolley 8	Card 12 organic price increase 5% Certification $3000 Group Price of compost trolley 1500 Labour days per trolley 8	Card 20 organic price increase 11% Certification $1000 Group Price of compost trolley 1500 Labour days per trolley 16	Card 28 organic price increase 5% Certification $1000 Group Price of compost trolley 600 Labour days per trolley 4
Card 5 organic price increase 13% Certification $3000 Group Price of compost trolley 1200 Labour days per trolley 16	Card 13 organic price increase 9% Certification $3000 Individual Price of compost trolley 1200 Labour days per trolley 12	Card 21 organic price increase 13% Certification $3000 Group Price of compost trolley 600 Labour days per trolley 4	Card 29 organic price increase 13% Certification $1000 Group Price of compost trolley 900 Labour days per trolley 16
Card 6 organic price increase 9% Certification $1000 Group Price of compost trolley 900 Labour days per trolley 12	Card 14 organic price increase 7% Certification $3000 Group Price of compost trolley 900 Labour days per trolley 8	Card 22 organic price increase 7% Certification $3000 Group Price of compost trolley 900 Labour days per trolley 4	Card 30 organic price increase 9% Certification $3000 Individual Price of compost trolley 1500 Labour days per trolley 8
Card 7 organic price increase 15% Certification $1000 Group Price of compost trolley 900 Labour days per trolley 4	Card 15 organic price increase 9% Certification $3000 Group Price of compost trolley 600 Labour days per trolley 4	Card 23 organic price increase 5% Certification $3000 Individual Price of compost trolley 600 Labour days per trolley 4	Card 31 organic price increase 5% Certification $3000 Individual Price of compost trolley 900 Labour days per trolley 16
Card 8 organic price increase 5% Certification $3000 Group Price of compost trolley 1500 Labour days per trolley 8	Card 16 organic price increase 5% Certification $3000 Group Price of compost trolley 900 Labour days per trolley 16	Card 24 organic price increase 7% Certification $3000 Group Price of compost trolley 1500 Labour days per trolley 12	Card 32 organic price increase 7% Certification $3000 Group Price of compost trolley 900 Labour days per trolley 8

Card 33 organic price increase 7% Certification $1000 Group Price of compost trolley 1200 Labour days per trolley 4	Card 41 organic price increase 7% Certification $1000 Group Price of compost trolley 1200 Labour days per trolley 8	Card 49 organic price increase 15% Certification $3000 Group Price of compost trolley 1200 Labour days per trolley 4	Card 57 organic price increase 5% Certification $3000 Group Price of compost trolley 1500 Labour days per trolley 4
Card 34 organic price increase 5% Certification $3000 Group Price of compost trolley 900 Labour days per trolley 12	Card 42 organic price increase 15% Certification $3000 Individual Price of compost trolley 600 Labour days per trolley 12	Card 50 organic price increase 7% Certification $3000 Group Price of compost trolley 1500 Labour days per trolley 12	Card 58 organic price increase 5% Certification $1000 Group Price of compost trolley 1200 Labour days per trolley 16
Card 35 organic price increase 13% Certification $3000 Individual Price of compost trolley 900 Labour days per trolley 12	Card 43 organic price increase 9% Certification $1000 Group Price of compost trolley 900 Labour days per trolley 16	Card 51 organic price increase 5% Certification $1000 Group Price of compost trolley 1200 Labour days per trolley 12	Card 59 organic price increase 15% Certification $3000 Group Price of compost trolley 1200 Labour days per trolley 8
Card 36 organic price increase 13% Certification $3000 Individual Price of compost trolley 600 Labour days per trolley 8	Card 44 organic price increase 7% Certification $1000 Group Price of compost trolley 600 Labour days per trolley 12	Card 52 organic price increase 11% Certification $3000 Group Price of compost trolley 600 Labour days per trolley 12	Card 60 organic price increase 7% Certification $1000 Group Price of compost trolley 600 Labour days per trolley 12
Card 37 organic price increase 7% Certification $3000 Group Price of compost trolley 1500 Labour days per trolley 16	Card 45 organic price increase 11% Certification $3000 Group Price of compost trolley 600 Labour days per trolley 16	Card 53 organic price increase 5% Certification $3000 Individual Price of compost trolley 1200 Labour days per trolley 16	Card 61 organic price increase 7% Certification $1000 Group Price of compost trolley 600 Labour days per trolley 16
Card 38 organic price increase 13% Certification $3000 Group Price of compost trolley 1200 Labour days per trolley 12	Card 46 organic price increase 9% Certification $3000 Group Price of compost trolley 1200 Labour days per trolley 16	Card 54 organic price increase 7% Certification $3000 Individual Price of compost trolley 1500 Labour days per trolley 16	Card 62 organic price increase 11% Certification $1000 Group Price of compost trolley 900 Labour days per trolley 4
Card 39 organic price increase 11% Certification $3000 Group Price of compost trolley 1200 Labour days per trolley 4	Card 47 organic price increase 13% Certification $1000 Group Price of compost trolley 1500 Labour days per trolley 4	Card 55 organic price increase 11% Certification $1000 Group Price of compost trolley 900 Labour days per trolley 8	Card 63 organic price increase 7% Certification $3000 Individual Price of compost trolley 600 Labour days per trolley 16
Card 40 organic price increase 5% Certification $3000 Individual Price of compost trolley 1500 Labour days per trolley 4	Card 48 organic price increase 13% Certification $1000 Group Price of compost trolley 1500 Labour days per trolley 8	Card 56 organic price increase 15% Certification $3000 Individual Price of compost trolley 900 Labour days per trolley 8	Card 64 organic price increase 11% Certification $3000 Individual Price of compost trolley 1200 Labour days per trolley 8

APPENDIX 5. Questionnaire update form

Choice Experiment Questionnaire Update Form

Week ending: 16th September 2005 (*change weekly*)

Email to: mamta@winrockindia.org
From: Dr. Vivek Sharma, CARD, Bhopal

1. Update sample frame from previous week in table 1.

Table 1. Sample frame

ID	ZONE	VILLAGE	Target sample of farmers	Actual sample of farmers	Interest groups (no. farmers)		
					SC	ST	Female
5	BMC	Bamhori	8	0	0	0	0
7	BMC	Barkheda Nathu	48	0	0	0	0
17	BMC	Bishan Khedi	48	0	0	0	0
27	BMC	Gol Khedi	24	0	0	0	0
28	BMC	Goria	8	0	0	0	0
61	BMC	Mugaliyachhap	56	0	0	0	0
80	BMC	Sewaniya	8	0	0	0	0
		sub-total	***200***	***0***			0
32	LOWK	Int Khedichhap	32	0	0	0	0
37	LOWK	Kajlas	32	0	0	0	0
41	LOWK	Khajoori Sadak	64	0	0	0	0
52	LOWK	Kolu Khedi	32	0	0	0	0
70	LOWK	Pipaliya Dhakad	40	0	0	0	0
		sub-total	***200***	***0***			0
16	UPK	Bilkisganj	48	0	0	0	0
23	UPK	Dhabla	48	0	0	0	0
54	UPK	Kulas Kalan	48	0	0	0	0
55	UPK	Kulas Khurd	48	0	0	0	0
87	UPK	Uljhawan	48	0	0	0	0
		sub-total	***240***	***0***	0	0	0
		Total	***640***	***0***			

2. Random verification of data entry.
   2.1 One in ten questionnaires verified independently against inputted data? Yes/No
   2.2 Who was responsible for the verification? "*name*"
   2.3 What action was taken if there were mistakes identified? …….
   ……..
3. If there were significant problems with data collection this week please specify:
……..
……..
4. Any other important issues that emerged from this week's work?
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