Heterogeneous interests and monetary payments for afforestation: findings from a framed field experiment in Uttara Kannada, India

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Online Appendix

Appendix A. Procedure involved in playing the game

Each session proceeded as follows. The five participants in a session played five rounds of tree plantations. Before every game, the participants were given 5 minutes for discussion before making their decisions, but they were not bound by the decisions discussed in the group. Each participant then gave the money (INR 500 per tree from their initial INR 10,000 endowment) for the number of trees they decided to plant, which was represented by tokens. They then placed tokens on the game board representing the number of trees to plant out of the total 100 spaces available. The two varieties of trees were identified by two types of tokens which they could take. After the decisions were made simultaneously by all the participants, trees were first 'planted' on the game board. Figure A1 presents an example of a planted forest simulated using a board game.

Figure A1. The Simulated Forest at the end of a round in a game.

The individual payoffs in the three games are as follows:

$$Payoff\ for\ Game\ 1\ (Only\ NTFP):$$
$$\left(10{,}000 - 500 * (C_{iG} + N_{iG})\right) + 160 * C_G + NT\ (worth\ 200) * N_S \ldots (\text{A. } 1)$$

$$Payoff\ for\ Game\ 2\ (NTFP + Money):$$
$$\left(10{,}000 - 500 * (C_{iG} + N_{iG})\right) + 160 * C_G + 140 * N_S + NT(worth\ 60) * N_S \ldots (\text{A. } 2)$$

$$Payoff\ for\ Game\ 3\ (Only\ Money):$$
$$\left(10{,}000 - 500 * (C_{iG} + N_{iG})\right) + 160 * C_G + 200 * N_S \ldots (\text{A. } 3)$$

$$where$$
$$C_G = \sum_i C_{iG}$$
$$N_S = \sum_i N_{iG} * Survival\ rate \ldots (\text{A. } 4)$$

If, for instance, everybody in the group plants five native species and five commercial species and the die roll is 4, the payoff in each game scenario will be as follows:

Game 1: Each person will have game money of 5,000 left with them $(10{,}000 - 500 * 10)$. Since each commercial tree gives a payoff of Rs. 800 and is a public good, each player gets Rs. 160 from each of the planted commercial trees. In total, the player gets game money of 4,000 from the commercial trees ($160 * 25$ commercial trees planted by the group). The payoff from the native species is dependent on the survival rates decided by the die roll. For a die role of 4, it corresponds to a survival rate of 80% which would mean the individual gets payoff for $25 * 0.8 = 20$ native species trees. Since these trees also are a public good, the individual will receive a payoff of $20 *$ NT (worth 200) or NT worth 4,000 rupees.

Game 2: Each person will have game money of 5,000 left with them $(10{,}000 - 500 * 10)$ and will receive game money of 4,000 from the commercial trees ($160 * 25$ commercial trees planted by the group). For a die role of 4, it corresponds to a survival rate of 80% which would mean the individual will receive a monetary payoff of $20 * 140$ game money and $20 *$ NT (worth 60) i.e., 2,800 rupees of game money and NT worth 1,200 rupees.

Game 3: Each person will have game money of 5,000 left with them ($10{,}000 - 500 * 10$) and will receive game money of 4,000 from the commercial trees ($160 * 25$ commercial trees planted by the group). For a die role of 4, it corresponds to a survival rate of 80%, which would mean the individual will receive a monetary payoff of $20 * 200$ game money or 4,000 rupees of game money.

The differences in payoffs in the three games are related to the rewards for native species, which is NT worth 4,000 rupees of game money in the "only NTFP" game, 2,800 rupees and NT worth 1,200 rupees in the "NTFP+Money" game, and 4,000 rupees of game money in the "Only money" game.

Each of the group plays only one of these games, which is randomly assigned by the experimenter.

Appendix B. Results of OLS Regression

Estimation using a linear regression using ordinary least squares method is as follows:

$$y_{jn} = \beta_0 + \beta_1 * Money\ and\ NTFP\ Game\ Dummy + \beta_2 * Only\ Money\ Game\ Dummy + \beta_3 * Money\ and\ NTFP\ Game\ Dummy * Betta\ Land\ Ownership\ Dummy + \beta_4 * Only\ Money\ Game\ Dummy * Betta\ Land\ Ownsership\ Dummy + \sum_i \beta_i x_{jn} + u_{jn},$$

where y_{jn} is the outcome variable for an individual *j* in the *n* the group, β_1 to β_4 are the estimates of our interest for game-type dummies and dummies for *betta* land ownership, x_{jn} are the correlates including age, sex, education, and a dummy for areca cultivation, and u_{jn} is the error term. In such an estimation, the underlying assumption is that there is no impact of group-level aggregation of variables on the outcome variable.

Table A1: OLS estimation results

Dependent variable	Share of total trees planted	Share of native species planted
Base = "Only NTFP" game		
Played "NTFP+Money" game	9.45***	8.11***
Played "Only Money" game	-0.27	5.41*
Betta owner dummy	-21.82***	-28.2***
Game 2 * *betta* ownership dummy	10.23	17.31**
Game 3 * *betta* ownership dummy	27.83***	33.25***
Has grown areca nut tree in their land	-2.09	10.02***
Age of the respondents	0.08	0.28***
Gender (=1 if female and 0 otherwise)	-7.55***	-4.28
Education (base = illiterate and primary)		
Education (secondary)	2.99	3.95
Education (higher secondary and above)	6.32*	18.45***
Village fixed effects	Yes	Yes
N	**600**	**600**

Note: *, **, and *** indicate statistical significance at the 10%, 5%, and 1% confidence level respectively.