**“Money Growing on Trees” Instructions**

**Overview:**

You are a household in the beautiful, but low-income, tropical country of Ephoria. You live in a rural area on the margin of a forest. There used to be much more forest and many fewer people living in this area, but the expansion of urban areas and agriculture over the last few decades has put a bit of a crunch on your local area (even though it is not geographically close to urban centers).

You and the members of your small, traditional community support yourselves primarily through small-scale agriculture in your garden plots (subsistence farming) and from harvesting wood and non-timber forest products such as fruits and nuts, medicinal plants, fish and game, and bark and fibers from the local forest. You use the wood you harvest from the forest for cooking and heating, but this harvest contributes to climate change and deforestation. If you don’t harvest wood and materials from the forest, you either do without or buy replacement food and fuel on the market.

You were randomly given a playing card at the start of this session. The number on this card (1-10, or Joker or a face card) determines your harvest value: the benefits your family gets when you harvest from the forest. Harvest values vary for many reasons. For example, different parts of the forest may yield different harvestable goods, some households may have more family members (e.g., children or aging relatives) to support, and some households may have better access to other opportunities to earn income. If you got a number card, then your value for harvesting is usually $10 times the number on your card. If you got a Joker or a face card, then your value for harvesting is $0. Note the forest is commonly owned, but is so large that your harvest doesn’t affect that of your community members right now, and vice versa.

To fight deforestation and raise revenue, policymakers in your country have decided to experiment with payments for ecosystem service (PES) schemes through an internationally-financed program. Local households and/or communities will make contracts with the program’s administrators. Then people or firms outside the country, typically in developed countries, will “buy” units of avoided deforestation from Ephoria to offset their greenhouse gas emissions.

In this session, we will play through contract periods of several different situations. In each period, you must make a decision: usually, whether to enter into a PES contract, which will prohibit you from harvesting wood from the forest. You may have another decision to make as well. You will have earnings that will depend on your choices, in some cases the choices of other households, and in some cases on chance. However, if your earnings are not at least $75 in a period, then you and your family are unable to eat for a day, which means that any babies in the family will cry all night and your life will be pretty unpleasant.

At the end of the session, we will pick one or more participants who will earn actual money equal to the sum of their earnings in all rounds divided by $100. Because real money is on the line, you should pay close attention and be sure to make the decisions that you really want to make!

**Your earnings:**

In each contract period, your earnings are:

Earnings = Farming Income + PES Payment + Forest Harvesting – (Policing or Fines)

Farming Income: this comes from your subsistence farming on the plot of land in your yard. Except when otherwise noted, this is $70.

PES Payment: if you enter into a contract, you get a PES (payments for ecosystem services) payment. Except when otherwise noted, this is $50. You can think of this as including both the money from the PES contract and any additional value (e.g., labor earnings) you get from the time that has been freed up that you would have otherwise spent harvesting from the forest.

Forest Harvesting: if you enter into a PES contract, you agree not to harvest wood from the forest. If you don’t enter into a PES contract, except as noted, you earn an amount from harvesting equal to $10 times the number on your card or $0 if you got a Joker or face card.

(Policing or Fines): these do not apply in periods in which illegal harvest is impossible. When illegal harvesting is possible, you may incur additional costs from fines or to finance policing.

**Contract Period 0: Baseline**

Earnings and decisions are as described above but PES contracts are not available. Your decision is simply to harvest wood or not.

**Contract Period 1: Payments for Ecosystem Services (PES)**

Earnings and decisions are exactly as described above. If you decide to enter into a PES contract, you must not harvest wood. (All PES parcels are audited and monitored to ensure zero harvesting; this is true in all contract periods except as otherwise noted.)

**Contract Period 2: PES + Illegal Harvest**

Everything is as in the PES Contract Period except that you can commit enter into a PES contract and then harvest wood anyway. Each parcel in a PES contract will be audited with a 25% likelihood. If you are audited and found to be harvesting, you will not receive your PES payment and you will have to give up your harvest, and you will also be fined $70.

**Contract Period 3: Harvest Uncertainty**

There is a disease going around your community this year, so some people will by bad luck be incapacitated and unable to harvest! Each household that tries to harvest has a 50% chance of getting $20 times the number on their card and a 50% chance of getting $0. The plague will strike after you have decided whether to participate in the PES program. Otherwise the period proceeds like the PES Contract Period.

**Contract Period 4: Auction**

Instead of declaring whether to enter into a PES contract at a fixed price, you will instead declare the price at which you would be willing to enter into a PES contract. The lowest 50% of the bids will be given PES contracts, and they will be paid an amount equal to the lowest bid that was *not* accepted. The households with higher bids will not have PES contracts and may instead harvest wood from the forest.

**Contract Period 5: Community Contract**

You will be randomly grouped into one of six small communities. As a group, you must discuss and decide whether to enter your community’s forest into a PES contract, at a payment rate of $50 per household. You must figure out among yourself how to decide (e.g., majority vote, consensus, etc.) and, if you enter into a contract, how to divide the PES payments among yourselves. If a community enters into a PES contract, *no-one* in the community can harvest wood from the forest.

**Contract Period 6: Community Contract + Illegal Harvest**

You will be in the same community as before and again decide collectively on whether to enter into a PES contract and, if so, how to share PES payments. But individual households in the group can now break their contract promise: they can secretly harvest from the forest even though their community has entered into a PES contract.

The community can collectively choose to police itself. If it does, each household pays $5 and all member households will be monitored by trustworthy locals. This monitoring prevents illegal harvest because potential illegal harvesters are totally deterred from entering the forest. If the community does not police itself, there is a chance it will be audited by the government body overseeing the PES project. The audit likelihood increases by 10% for each person in the community who illegally harvests (starting from 0% if there is no illegal harvest), because more harvest makes it easier to detect. Note that auditing happens at the community level: an entire community is either audited or not. If it is audited and *any* illegal harvest is found, no-one in the community will get PES payments or harvest value (harvested wood must be returned), and *each* member of the community will be fined $70.

So the order of actions for this contract period is:

1. Community decision: Join the PES program or not?
2. If adopt the PES contract: Community decision: Engage in policing or not?
3. If no policing: Household decision: Conduct illegal harvesting or not?
4. Government action: each *community* that adopted a PES contract and is unpoliced is audited with probability 10% times number of people harvesting illegally

**“Money Growing on Trees” Recording Sheet**

**Name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

My playing card (1-10 or J, Q, or K for joker or face card):

My ID number (1 to # participants) from spreadsheet:

My decisions and my earnings (fill in the table below as the contract periods progress):

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **CP** | **Conditions** | **CHOOSE:**  **Bid** | **CHOOSE:**  **PES / Harvest?** | **CHOOSE:**  **Illegal Harvest?** | **Audited?** | **A**  **Farming Income** | **B**  **PES Payment** | **C**  **Forest Harvesting** | **D**  **Policing, Fines, etc.** | **Earnings=**  **A+B+C-D** |
| 0 | Baseline |  | Harvest No |  |  | $70 |  | $ |  | $ |
| 1 | PES |  | PES No |  |  | $70 | $ | $ |  | $ |
| 2 | Illegal Harvest |  | PES No | Y N | Y N | $70 | $ | $ | $ | $ |
| 3 | Uncertainty |  | PES No |  |  | $70 | $ | $ |  | $ |
| 4 | Auction | $ | PES No |  |  | $70 | $ | $ |  | $ |
| 5 | Community |  | PES No |  |  | $70 | $ | $ |  | $ |
| 6 | Comm+Ill Hrv |  | PES No | Y N | Y N | $70 | $ | $ | $ | $ |
|  |  |  |  |  |  |  |  |  | TOTAL | $ |

(Reminder: if in some round you illegally harvest, are audited, and are fined, cross out your B and C columns for that round – their values are zero if you are caught cheating on a contract!)