

Report



AfricaRice



EXPERIMENTAL AUCTION FOR MOTORISED WEEDING SERVICE IN MADAGASCAR

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A. Background and objective

In Madagascar, 2 prototype motorized weeders were imported by AfricaRice in 2020. These machines were piloted in the region of Menabe (western of Madagascar) and some adaptations were made together with local fabricator to match the spacing of rice used by farmers in the region. Demonstration and testing were completed with rice farmers from Ankilizato in 2021 during the two rice growing seasons.

According to the farmers, they appreciated the machine as it allows quick and efficient weeding and most of them indicated that they would like to buy and own the weeder. Unfortunately, local fabricators could not manufacture and sell motorized weeders at the moment because engines are not available locally. The solution we can propose is to sell a motorized weeding service to farmers with the two weeders that are available now.

That's why we conducted experimental auction which aimed at eliciting the farmers' willingness to pay (WTP) for a motorized weeding service per are (100m²).



B. Process of the experimental auctions

1. Preparation of the WTP elicitation instructions

In 2021, similar experimental auction was already conducted by researchers working with AfricaRice with rice farmers from the Doho Irrigation Scheme in Uganda. So, the WTP elicitation instructions that we used during the experiment in Madagascar were adapted from the instructions used in previous experiment in Uganda.

2. Training on the WTP elicitation instructions

Before conducting the experiment, our three research assistants were trained by Dr Lauriane Yehouenou, Agro-economist and Research Project Manager at Northwestern University Evanston (United States) through on-line training. The training aimed at helping the trainees to fully understand the instructions on conducting the experimental auction.

3. Design of the experimental session

➤ Where and when were the experimental auctions conducted?

Two experimental auction sessions were conducted by the AfricaRice agronomic researcher team with rice farmers from two different places: Malaimbandy and Ankilizato (in the western

region of Madagascar) respectively on 20th and 21st July 2022 (around the beginning of the second rice growing season).

➤ **How did we recruit the participants?**

In Malaimbandy, we collaborated with the local motorized weeding service provider. We explained the objectives of the study to him and he helped us in randomly recruiting rice farmers from the scheme. He also served as a link between us and the farmers.

Whereas in Ankilizato, we decided to inform the farmers through radio telecast as it enabled to randomly reach the famers.

➤ **How did we organize the experimental auction sessions?**

During the first day in Malaimbandy, we first proceeded with demonstration to show the motorized weeder to farmers. It also aimed to enable farmers to see how the weeder works and to perceive the efficiency of the weeding with the motorized weeder. Right after the demonstration, the bidding process were explained to farmer and we followed up with the auction in the field.

As for Ankilizato, farmers were able to demonstrate with the motorized weeder during the 1st and 2nd rice growing season of 2021, so we didn't do the demonstration part in Ankilizato village. We directly conducted the experimental auction by gathering the farmers in a meeting room.

4. The bidding procedures

Each experimental session involved the following steps:

➤ **Introduction**

We started the experimental auction session in Malagasy language. We explained to participants the purposes of the study, that we will be selling a weeding service and they will bid to receive a motorized weeding service per are (100 m²) for the first weeding during the current growing season. They were also informed that they were going to receive a participation fee of 5 000 MGA per person (~US\$1.21).

➤ **Explanation of the bidding procedures**

The bidding instructions were first explained to participants jointly, however the auction was done individually. Here is how the promotion works:

- Farmers were asked to tell the maximum price they are willing to pay for the weeding service per are.
- They were shown a bag in which there were many different prices written on paper and folded. The numbers represent prices for the weeding service per are. Based on the service provider's price (20 000 MGA per are), we defined 13 different prices as the actual price which are 5 000, 8 000, 10 000, 13 000, 15 000, 18 000, 20 000, 23 000, 25 000, 28 000, 30 000, 33 000 and 35 000 MGA. During the auctions, we did not reveal the market price of the service to the participants in order to incite farmer to state the true maximum price they are willing to pay for the service.
- Then, they were asked to pick one price from the bag, and we looked at the price together.
- If their Willingness to Pay **is equal or higher** than the price selected from the bag, they will purchase the weeding service and will pay the price they picked from the bag.
- In contrary, if their Willingness to Pay **is lower** than the price selected from the bag, they will not purchase the weeding service.
- Each farmer had only one chance to play and could not change their bid after drawing a price from the bag.

➤ **Practice game with soap**

Before bidding for the weeding service, we practiced the WTP instructions by playing for a perfumed soap to familiarized the participants with the auction procedures. We showed the perfumed soap to participants and asked them the maximum amount that they were willing to pay for the soap. Then, we followed all the instructions described above. We conducted one round with an evaluation in order to ensure that all participants fully comprehended the instructions.

➤ **Individual auction for the weeding service**

After the practice game with soap, each farmer played individually to buy the motorized weeding service per are by using a similar procedure described above.

The farmer bid for the service per unite surface. If their bid is successful, they received a voucher which mentioned the selected price for the weeding service per are. Therefore, the total amount that farmer should pay depends on the size of the plot they wanted to be weeded.

C. Results from the experimental auctions

- Session times were around 2h and 20 min in Malaimbandy (first day) and 3h and 45 min in Ankilizato (second day) from the introduction until all the farmers finished individual auction.

- The number of participants to the experimental auction is presented in table 1. In total, 162 farmers took part in the study, 38.3% of them are women.

Table 1: Number of participants to the experimental auction

Location	Malaimbandy	Ankilizato	Total
Number of participants	61	101	162
Man (%)	75.4	53.5	61.7
Woman (%)	24.6	46.5	38.3

- The farmers' willingness to pay for motorized weeding service per are is shown in figure 1.

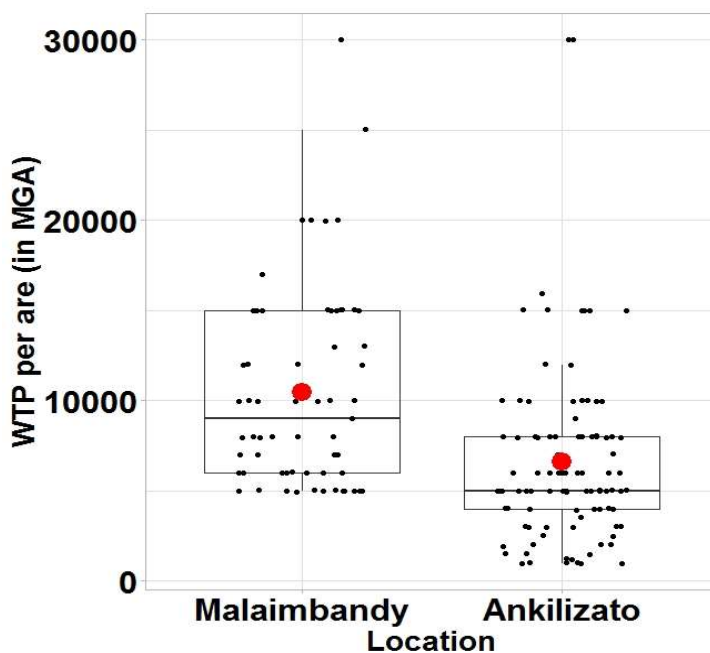


Figure 1: Farmers' WTP for motorized weeding service

This figure shows that most of the farmers (95%) are willing to pay lower than the service provider's price of 20 000 MGA per are.

In Malaimbandy, the maximum price that farmers are willing to pay for motorized weeding service per are varied from 5 000 to 30 000 MGA. Whereas in Ankilizato, it ranged between 1 000 to 30 000 MGA.

Analysis of variance shows that the farmers' WTP for weeding service in Malaimbandy (mean 10475 ± 708 MGA) is significantly higher than in Ankilizato (mean 6637 ± 492 MGA) (p -value < 0.05). Farmers in Ankilizato are not willing to pay more than 7 000 MGA per day (which is the daily rate for hand weeding) even though motorized weeder can weed greater surface than hand weeding.

- Number of farmers who purchased the weeding service (who won the bid)

Table 2: Number of farmers who win the auction

Location	Malaimbandy	Ankilizato	Total
Number of farmers who won the bid	13	14	27
%	21.3	13.9	16.7

Among 162 farmers who participated to the auction, only 27 (=16.6%) won the auction. None of them has practiced with the motorized weeder due to unavailability of the service provider during the period of weeding. Some of the winner also didn't plant in line.

Recurring issue:

Self-recruitment of participant would still be a problem as was the case during our experiment. Some participants would just come to the experiment in the hope they would receive the participation fee (without being interested in buying the service).

D. Some pictures



Demonstration of motorized weeder in Malaimbandy



Explanation of the objective of the auction and the process to the participants in Malaimbandy



Explanation of the objective of the auction and the process to the participants in Ankilizato