

## Extended Abstract

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<b>Paper/Poster Title</b>	Seasonal scarcity and environmental conservation: Investigating the impact of the hunger season on farmers' decision making in Madagascar
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**Abstract prepared for presentation at the 98th Annual Conference of The Agricultural Economics Society will be held at The University of Edinburgh, UK, 18th - 20th March 2024.**

<b>Abstract</b>	<b>200 words max</b>
<p>This paper focuses on how relative poverty affects decision-making in developing countries, in the context of conservation programmes used to encourage behaviour change amongst farmers. Recent evidence suggests that the psychological impact of being poor exacerbates a poverty trap mechanism. In parallel to the effect of absolute poverty, other research demonstrates the effect of relative poverty (i.e. unbalanced cash flow) on behavioural preferences. Under some circumstances, such as in poor rural areas, this relativity of poverty can be very pronounced. In this paper, we are interested in complementing earlier research on the effect of economic fluctuation on risk and time preferences in the context of poor and rural areas, by integrating the study of scarcity's impact on social and environmental preferences. We implemented a choice experiment (CE) and a behavioural preferences module both before and after harvest, collecting about 400 observations in total. We find that farmers in Madagascar rural areas are significantly affected by the relative scarcity phenomenon. The impact on risk preference is strong and robust to the method used for its assessment, and if reflected in farmers' preferences for conservation contracts' characteristics.</p>	
<b>Keywords</b>	Payments for Ecosystem Services, preferences, risk
<b>JEL Code</b>	Q18, Q57, D9 see: <a href="http://www.aeaweb.org/jel/guide/jel.php?class=Q">www.aeaweb.org/jel/guide/jel.php?class=Q</a> )
<b>Introduction</b>	<b>100 – 250 words</b>
<p>The agricultural calendar in developing countries is characterised by important variations in farmer's resource availability and income streams, with periodic successions of shortage and abundance. This intra-annual variability is often experienced within a setting of high levels of poverty. Our main objective in this paper is to investigate how such seasonal variations affect the willingness of farmers in a low-income country to enrol in Payment for Ecosystem Service (PES) schemes, through the mechanisms of changing time, risk, social and environmental preferences.</p> <p>PES schemes need to operate year-round and be attractive to "enough" farmers to achieve their environmental goals. The effects of seasonal variations in resources or income on up-take of PES schemes is thus an important, though neglected, issue. We suggest that farmers' willingness to participate in PES programmes will depend not just on the payment offered, but on their risk, time, social and environmental preferences. Moreover, we contend that these preferences may vary according to changes in relative poverty or income flows over the course of a year. Work by Dessart et al (2019), amongst others, highlights the wide range of economic and behavioural factors underlying farmers' willingness to adopt more</p>	

sustainable land use practices. Time, risk, social and environmental preferences are key factors in economic decision-making, particularly among farmers in developing countries (Binswanger, 1980, Yesuf & Bluffstone, 2009, Galarza, 2009).

We show that variations over time in incomes related to seasonal scarcity lead to changes in both willingness to enrol in a PES scheme and preferences.

### **Methodology**

**100 – 250 words**

The study takes place in 8 villages surrounding Lake Alaotra, Madagascar. We conduct a field study to examine differences in preferences and intended participation in a PES scheme in two extreme conditions: before and after harvest. Individual rice producers in Madagascar have resources incomes largely based on their harvest, which happens only once a year. The end of the cycle immediately prior to this year's harvest (their hunger season) is a particularly difficult period for many rural households.

Our experimental method develops a single protocol to estimate time, risk, social and environmental preferences simultaneously through a stated preference choice experiment (Hanley and Czajkowski, 2019). This contextualised protocol enables the estimation of the relative weights of time, risk, social and environmental preferences in individual choices over participation in a hypothetical but realistic local PES scheme. This choice experiment (CE) is complemented by in-depth survey questions on time, risk and social individual preferences, from the Global Preference Survey (Falk et al., 2022), an experimentally validated module to assess risk, time and social preferences. Finally, we use the New Environmental Paradigm scale as an alternative measure of environmental preferences (Dunlap, 2008). Thus, our protocol allows us to estimate time, risk, social and environmental preferences simultaneously within a context-specific choice experiment, but also allows alternative, more widely-used measurements of each of these 4 preference parameters as a cross-check. We undertake this estimation in 2 samples: one collected during the hunger season, and one after harvest.

### **Results**

**100 – 250 words**

We first see that farmers have a strong preference for participation in the PES scheme rather than continuing in their current situation. We find a positive effect of the timing of the first payment suggesting that farmers prefer to receive payments later rather than sooner. Farmers prefer schemes with a lower share of the payment conditioned on achievement of environmental results, displaying risk aversion. Farmers seem to prefer schemes that provide payments to individuals rather than the group of farmers. Farmers display positive and significant preferences for schemes associated with more wetland restoration holding everything else constant, therefore displaying positive environmental preferences. Finally, the payment attribute has a positive and significant effect on farmers' choices.

The choice experiment's results show that the only PES design preference that varies between the pre-harvest (hunger) and the post-harvest season, i.e. with relative scarcity, is their preference for the share of payment conditioned on uncertain outcomes. This would indicate that, while being globally risk averse, farmers display more risk-loving attitudes after harvest. This result is supported by farmers' risk preferences elicited in the behavioural module.

<b>Discussion and Conclusion</b>	<b>100 – 250 words</b>
<p>We find that farmers in Madagascar rural areas are significantly affected by the relative scarcity phenomenon. The impact on risk preference is strong and robust to the method used for its assessment. We also find an impact on social and environmental preferences in results from the behavioural module, but that do not translate into the choice experiment results. The impact on time preference is not straightforward, although this could be due to the assessment method, and the difficulty to measure time preferences in such context.</p> <p>Second, our findings contribute to the debate on poverty and decision-making (e.g., Spears 2011; Mullainathan &amp; Shafir 2013; Haushofer &amp; Fehr 2014), but do not support the hypothesis that resource scarcity impedes cognitive function. In our case, the change in decision making does not seem to be inferred by physiological abilities but rather a change in the economic situation, shifting from relatively poorer to relatively richer.</p> <p>Development programmes impact farmer’s cash flow via economic incentives. They could also impact farmer’s preference by interfering with their level of relative poverty. Those results suggest that the schedule of the incentives matter. It opens new way to design policy interventions by suggesting the leveraging potential of the seasonality of incentives in generating impact.</p>	