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15 September 2026

Organizers, Workshop on Development Economics and Networks for Early-Career Researchers
National Bureau of Economic Research

Dear Professors Breza, Chandrasekhar, and Viviano,

I am a fifth-year doctoral candidate in Agricultural, Food, and Resource Economics at Michigan State University, and I am writing to apply to the NBER Workshop on Development Economics and Networks for Early-Career Researchers. My dissertation examines the political economy of agricultural water use in Tanzania. The workshop would be a valuable opportunity to present and improve the third chapter of my dissertation, which studies how social norms and peer effects shape irrigation-fee compliance among Tanzanian irrigators.

In the working paper titled "Irrigate as I Say, Not as I Do," I ask whether non-pecuniary factors like peer effects and social norms shape irrigators' compliance with fee regulations. To disentangle these two channels, I designed a lab-in-the-field experiment that pairs an irrigation-fee game (a modified public goods game) with a norm-elicitation framework, so that peers' behavior and prevailing norms can be identified separately in compliance decisions.

Rather than specifying a structural model ex ante and estimating its parameters, I first document reduced-form patterns in the irrigation-fee game and then ask which theories of social preferences can account for them. I am now moving from those reduced-form patterns to estimating the behavioral model and testing which class of social-preference theory best fits the observed behavior. The workshop's focus on development economics and the empirical study of social interactions suits this stage of the project well. As an early-career researcher working with original field data, I would benefit greatly from the lectures and from discussion with participants working on related methods and questions.

My application includes my curriculum vitae with a list of all completed PhD courses, a one-page statement of motivation and research interests, and an extended abstract with the key results tables. Dr. Mywish Maredia (Professor of Development Economics, Department of Agricultural, Food, and Resource Economics, Michigan State University; maredia@msu.edu) has agreed to provide a recommendation if I am shortlisted. Thank you for considering my application.

Sincerely,
Leslie Alex

Statement of Motivation and Research Interests

I am a Ph.D. candidate in Agricultural, Food, and Resource Economics at Michigan State University, specializing in the political economy of economic development in low- and middle-income countries. My research explores how resource constraints and institutional weaknesses shape the governance, financing, and sustainability of the agricultural water sector. My work draws on large-scale primary data collection, applied econometrics, geospatial data, and impact evaluation to identify how public infrastructure investment affects smallholder farmers. As part of my doctoral dissertation, I undertook extensive fieldwork across mainland Tanzania to examine how political economy factors mediate the relationship between irrigation infrastructure and agricultural outcomes, and how trust, social norms, and peer effects shape farmers' willingness to pay for irrigation.

Two of my dissertation essays ask why farmers pay for water when the state has limited monitoring and enforcement capacity. While policy discourse attributes persistent non-compliance to weak enforcement, compliance in Tanzania substantially exceeds what enforcement-based models would predict. The first essay asks whether social norms account for that gap. I develop a norm elicitation framework measuring the existence and intensity of fee payment norms, and apply it to two original surveys conducted across 24 regions in January 2026- an Irrigator Organization Leader Survey of 250 leaders and a National Irrigation Commission Manager Survey covering 478 schemes- testing whether leaders' injunctive and descriptive norms causally affect scheme-level compliance, and whether persuasion-based fee collection strategies outperform punitive ones, exploiting variation in the strategies a single manager applies across the irrigation systems across their portfolio. The second essay isolates the peer channel through a lab-in-the-field fee game in which respondents make a fee payment decision after observing hypothetical peer organizations' fee payment decisions. Together, the essays treat compliance as a multidimensional problem: what the state cannot extract through enforcement it may obtain through legitimacy, peer expectations, and the actions of irrigation fee managers.

Two features of the agenda draw me to the workshop. First, one of my identification strategies rests on indirect social interaction: I use an instrumental variable derived from regional-level means of the norm indicator. This strategy raises questions about reference-group definition, spillovers, and inference that the frontier of empirical network research could help address directly. Second, the irrigation fee experiment uses a hypothetical peer to sidestep the simultaneity that confounds estimating peer effects in observed behavior. Although this facilitates a cleaner identification strategy, it raises some concerns about external validity. I would welcome discussion of that trade-off with experts and peers who have encountered it in field settings. I would come to the workshop with original data from an under-studied setting and an interest in the methods that connect individual decisions to the social structures in which they are made.

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Research Interests

Political Economy of Water in Agriculture, Climate Adaptation and Resilience, Institutional Economics and Governance, Applied Econometrics and Impact Evaluation

Education

Michigan State University East Lansing, Michigan

Ph.D. in *Agricultural, Food, and Resource Economics* (2027 Spring)

University of California, Davis Davis, California

M.S. in *Agricultural and Resource Economics* (2022)

Visvesvaraya Technological University Bangalore, India

B.E. in *Industrial Engineering and Management* (2012)

Academic Publications

Akram, A. A., Alex, L., Freeman, J., Dal Santo, L., & Betancourt, T. S. (2026). Labor Market Impacts of a Mental Health and Entrepreneurship Intervention in Post-Conflict Sierra Leone: Evidence from Young Women and Men. The Journal of Development Studies, 1–19. https://doi.org/10.1080/00220388.2026.2658546

Desrosiers, A., Kumar, P., **Alex, L.**, et al. (2020). Diffusion and spillover effects of an evidence-based mental health intervention among peers and caregivers of high-risk youth in Sierra Leone: study protocol. BMC Psychiatry, 20(85).

Working Papers

Alex, L.J., Maredia, M.K., Tschirley, D., Wineman, A. From Plans to Pipelines: Unpacking the mediatory role of political economy factors in the relationship between irrigation infrastructure and household agricultural outcomes

Alex, L.J., Maredia, M.K., Tschirley, D., Nyange, D. Trust the Messenger: Improving Legitimacy of Irrigation Pricing Reforms in Tanzania

Alex, L.J., Maredia, M.K., Tschirley, D., Nyange, D. , The role of peer effects in irrigation fee compliance in Tanzania

Lawlor, C., Van Den Boom, W., Akram, A. A., **Alex, L. J**., Betancourt, T. S., Long-Run Labor Market Impacts from an entrepreneurship and mental health intervention in Sierra Leone.

Policy Reports and Technical Publications

Alex, L. J., World Bank. (2022). Somalia: An Institutional Analysis. Technical Report, World Bank (link)

Tuinhof, A., Delacámara, G., Groen, J., Danert, K., Sandström, K., **Alex, L. J.,** & Jain, N. (2021). Economics of Water: Digging for Data in Somalia - Towards Understanding Water as a Limiting or Enabling Factor for Socioeconomic Growth in Somalia (link)

Lee, S., Lavin, B., **Alex, L**., et al. (2018). Endline Performance Evaluation of the USAID Global Health Ebola Team Ebola Virus Disease Survivor Program. (link)

Conference Presentations

- *Advances in Field Experiments (AFE),* Becker Friedman Institute for Economics, University of Chicago, 2026: Paper presentation: Alex, L.J., Maredia, M.K., Tschirley, D., Nyange, D. Irrigate As I Say, Not As I Do: Disentangling Peer Effects and Social Norms Among Tanzanian Irrigators
- *Agricultural and Applied Economics Association (AAEA)*, Kansas City, Missouri, 2026: Paper presentation: Alex, L.J., Maredia, M.K., Tschirley, D., Nyange, D. Do Norms Pay the Bill: Norms, Fee Collection Strategies, and Irrigation Fee Compliance in Tanzania
- *Agricultural and Applied Economics Association (AAEA)*, Denver, Colorado, 2025: Paper Presentation: Alex, L.J., Maredia, M.K., Tschirley, D., Wineman, A. From Plans to Pipelines: Unpacking the impact of irrigation infrastructure on household agricultural outcomes
- MSU Graduate Research Symposium, East Lansing, Michigan, 2025: Alex, L.J., Maredia, M.K., Tschirley, D., Wineman, A. From Plans to Pipelines: Unpacking the impact of irrigation infrastructure on household agricultural outcomes

Teaching Experience

Lecturer. AFRE203 (Undergraduate) : Data Analysis for the Agri-Food System . Michigan State University, AFRE	2025

Guest Lecturer. (1 class). AFRE 891 (Ph.D.): Research Design and Writing in Applied Economics, Michigan State University, AFRE	2023
Guest Lecturer. (1 class). AFRE 900 (Ph.D.): Applied Microeconomics; Michigan State University, AFRE	2023
Reader. ARE 132 (Undergraduate): Cooperative Business Enterprises and AFRE 119 (Undergraduate): Financial Accounting for Managerial Economics; University of California, Davis	2021

Awards and Fellowships

- Outstanding Graduate Student Instructor Award, 2025; AFRE, Michigan State University
- The Allan Schmid Fellowship in Institutional Economics, AFRE; Michigan State University, 2024
- The Glenn and Sandy Johnson Dissertation Fellowship; AFRE, Michigan State University, 2024
- Rackham Research Endowment Grant Program, MSU AgBioResearch, 2025 — Grant supporting dissertation research and graduate stipend; PI: Dr. Mywish Maredia. Contributed to proposal development.
- Graduate Research Symposium Best Presentation Award, AFRE, Michigan State University, 2024

PhD Courses

Course	Course Type
Microeconomics I	Core Courses
Econometrics IA	
Microeconomics II	
Econometrics IB	
Applied Microeconomics	
Cross-Section Econometrics I Research Design and Writing in Applied Economics	
Empirical Methods in Field Research in Developing Countries	

Advanced Development Economics	Field Courses
Applied Econometrics	
Agriculture in Economic Development	
Advanced Data Analytics and Frontier Methods for Applied Economists	

Professional & Research Experience

Michigan State University

East Lansing, Michigan

Research Assistant (Dr. Mywish Maredia & Dr. David Tschirley) *(2022- present)*

- Management of the complete research cycle from proposal development, scoping fieldwork, questionnaire development, and data collection for irrigation surveys in Tanzania
- Developing the theoretical framework for the political economy of irrigation fee payments in Tanzania
- Oversaw data collection of two surveys across twenty-four regions in Tanzania. Responsible for data quality and field team monitoring.
- Currently leading the analysis and writing of two papers based on the two respective surveys
- Managing partnerships with government ministries and in-country partners to access and analyze administrative data required to complement primary data

The World Bank

Water Practice, East Africa Region

Economic Analyst Consultant *(Sept. 2020- Aug. 2021)*

- Exploratory socio-economic analysis of the water sector in Somalia in the context of drought management and climate change mitigation. Research outputs informed discussions between the World Bank country team and the Government of Somalia on investment in water resource infrastructure
- Geospatial analysis of the economics of water endowment, demand, and supply analysis disaggregated by regions, districts, livelihood zones, and aquifer/riverine zones
- Quantifying the socio-economic impact of failed rains on agropastoral and agriculture sectors
- Cost-benefit analysis- contributed to the development of a hydro-economic model that quantifies the long-run costs and benefits of improving water services

- Main author of the institutional analysis chapter of the publication
- Co-authored the final project report.

United Nations Development Program SDG Integration Team, Global

Economic Analyst *(Dec. 2020- Aug. 2021)*

- Impact evaluation consultant for multiple experimental and quasi-experimental studies on climate change adaptation and resilience of vulnerable ecosystems
- Development of economic analyses to support UNDP's Data Futures Platform and the Global Dashboard for Vaccine Equity
- Economic analyses of regional and economic planning policies for the Saudi Arabia country office
- Organized a series of workshops on evidence-based policymaking for the Government of Uzbekistan

Innovations for Poverty Action Freetown, Sierra Leone

Senior Research Associate/ Research Associate *(2018– 2020)*

- Research management- oversaw data collection for multiple concurrent RCTs with a combined sample size of 7000 respondents and a field team of 150 staff.
- Grant management and research administration- managed a cumulative research budget of USD 1 million. Coordinated proposal submissions and secured ethical approval from local and international institutional review boards.
- Digital survey coding- designed and coded complex adaptive socio-economic surveys in SurveyCTO
- Experimental tasks- co-led the design, piloting, and finalization of experimental tasks to measure willingness to pay in the context of improved labor market outcomes for women.
- Data quality assurance- analysis of survey data quality, reliability, and enumerator performance across multiple surveys
- Deliverables management- managed data cleaning and submission of multiple datasets, field reports, grant reports, and other deliverables in a multi-donor setting
  Worked with the following PIs: Imran Rasul (UCL), Oriana Bandiera (LSE), Marcus Goldstein and Niklas Buehren (World Bank), Theresa Bettencourt (Boston College)

Technical Skills

- Statistical programming: STATA and R
- Software and Tools: SurveyCTO, QGIS, SQL, .NET

References

1. **Dr. Mywish K. Maredia**

Professor of Development Economics
Department of Agriculture, Food and Resource Economics
Michigan State University
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2. **Dr. David Tschirley**
Professor,
Department of Agriculture, Food and Resource Economics
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Personal Information

- Citizenship: Indian
- Languages: English (native), Malayalam (native), Kannada (fluent), Tamil (fluent), Hindi (conversational), Sierra Leonean Krio (conversational)

Irrigate As I Say, Not As I Do: Disentangling Peer Effects and Social Norms Among Tanzanian Irrigators

Abstract

Irrigation fee compliance in Tanzania substantially exceeds what standard enforcement-based models would predict, suggesting that non-pecuniary factors play an important role in irrigators' payment decisions. This chapter investigates one such factor — peer effects — using a lab-in-the-field experiment embedded within a survey of 250 irrigator organizations (IO) leaders. The experiment takes the form of an irrigation fee game adapted from the gift-exchange literature. In the first round, respondents make an unconditional payment decision; given their IO's actual irrigation service fee (ISF) bill, they indicate how much they would choose to pay. In the second round, respondents observe the payment decision of a hypothetical peer IO: paying 0%, 25%, 50%, 75%, or 100% of its billed ISF, presented in randomized order. Respondents may revise their initial decision for each hypothetical scenario presented to them. Because the peer IO's payment has no effect on the respondent's payoff, any revision reflects behavioral rather than strategic motives. We combine the game data with an incentivized norm elicitation procedure and measures of altruism and reciprocity to examine which class of social preference theory—inequity aversion, reciprocity, or norm compliance—best accounts for the observed peer effects in irrigation fee payment decisions.

1. Introduction

Compliance behavior in settings such as tax payment and public service fees often exceeds what standard deterrence models would predict. Tax compliance rates, for instance, remain substantially higher than expected given the low rates of monitoring, auditing, and enforcement that characterize many emerging economies (Luttmer and Singhal, 2014). A parallel pattern holds for irrigation service fees in Tanzania, where irrigator organizations continue to make payments despite limited enforcement capacity. These surprising empirical regularities suggest that non-pecuniary factors, beyond the probability and severity of sanctions, play an important role in compliance decisions. A large experimental literature corroborates this view: in coordination games such as the dictator game, the gift-exchange game, and the public goods game, individuals routinely behave prosocially, accepting reduced own earnings to increase the earnings of other participants (Gachter, Nosenzo, and Sefton, 2013; Fischbacher, Gachter, and Fehr, 2002). Such prosocial behavior has been attributed to two broad classes of explanation—social norms and distributional social preferences (Thoni and Gachter, 2015). In Chapter 2, we examined the role of social norms in irrigation fee compliance. In this chapter, we investigate whether theories of social preferences can account for the peer effects observed in an experimental irrigation fee game embedded within a survey of Tanzanian irrigator organizations.

The experimental design of this chapter draws on the literature on peer effects in gift-exchange games. In a standard three-person gift-exchange game, itself an extension of the bilateral gift-exchange framework of Riedl (1993), a firm consists of an employer and two employees. The employer first chooses wages for both employees, which are publicly observed. Each employee then selects an effort level, incurring a cost that benefits the employer. A central feature of the design is that Employee 2 observes Employee 1's effort choice before making her own decision, even though the two employees' payoffs are independent. Studies using this framework have documented three key findings. First, employees' effort is positively correlated with the employer's wage offer: higher wages elicit higher effort, consistent with a reciprocity motive (Gachter, Nosenzo, and Sefton, 2013). Second, when one employee's effort is publicly observable, it substantially influences the other employee's effort choice despite the absence of payoff interdependencies between them. This phenomenon is labeled a “peer effect” (Thoni & Gachter, 2015; Gachter, Nosenzo, & Sefton, 2013). Third, this peer effect is asymmetric: employees tend to revise their effort downward in response to a co-worker's low effort but do not significantly revise upward in response to high effort (Thoni & Gachter, 2015).

A key methodological challenge in studying peer effects is the reflection problem (Manski, 1993): when individuals simultaneously influence one another, it is difficult to distinguish causal peer effects from correlated unobservables. Thoni and Gachter (2015) address this by introducing a revision stage in which participants first make an unconditional effort choice, then observe their co-worker's effort and may revise their own decision. Because the co-worker's effort is determined before the revision stage, it is exogenous to the revising participant's decision. We adapt this design for the irrigation fee context. In the first round, respondents make an unconditional payment decision indicating how much of their irrigation service fee they would choose to pay. In the second round, they observe the payment decision of a hypothetical peer irrigator organization and may revise their initial choice. This game structure with an unconditional decision followed by conditional revision is a variant of the strategy method (Selten, 1967) that is used widely in the experimental games literature (Gachter, Nosenzo, & Sefton, 2013) and enables causal identification of peer effects without the confounding effects of simultaneous mutual influence due to in-game decisions by multiple participants.

We make three contributions in this study. First, we provide a theoretical test of competing models of social preferences. We specifically analyze the Fehr and Schmidt (1999) model of inequity aversion, models of reciprocity (Dufwenberg and Kirchsteiger, 2004), and hybrid frameworks that combine distributional preferences with norm compliance and evaluate which class of theory best accounts for the peer effects observed in the irrigation fee game. Second, the study contributes to the policy literature on irrigation fee compliance by experimentally identifying the sensitivity of IO leaders' payment decisions to peer behavior. The game's five discrete peer payment levels—ranging from complete noncompliance (0%) to full compliance (100%)—provide a schedule of conditional responses from which we estimate compliance thresholds and the elasticity of payment decisions to peer signals. Third, the study seeks to disentangle the respective roles of social norms and social preferences in shaping compliance behavior. By combining the game data with survey-based measures of norms, altruism, and

reciprocity, the analysis can assess whether peer effects operate through internalized distributional preferences, adherence to perceived social norms, or some combination of both channels.

2. METHODS

2.1 Description of Experimental Task

The irrigation fee game is structured as a two-round incentivized task embedded within a broader survey of irrigator organization (IO) leaders across Tanzania. In the first round, we present each respondent with their IO's actual irrigation service fee (ISF) bill for the 2024–2025 main cropping season, calculated as total irrigated area multiplied by TSH 50,000 per acre. We then ask respondents to make an unconditional payment decision about how much of the billed ISF they would choose to pay. In the second round, respondents are asked to consider a hypothetical peer IO identical to their own in all aspects—irrigated area, crop composition, and cost structure — and billed the same ISF amount. Respondents then observe, in randomized order, five scenarios in which the peer IO pays 0%, 25%, 50%, 75%, or 100% of its billed ISF. For each scenario, the respondent indicates whether they would revise their first-round payment decision and, if so, specifies a new amount. Two features of this design merit emphasis. First, the peer IO's payment decision has no effect on the respondent's in game compensation. Any revision in the irrigation fee amounts in the second round, therefore, reflects behavioral motives rather than strategic considerations. Second, we designed the incentive mechanism to be orthogonal to game decisions: respondents receive TSH 5,000 or TSH 2,500 based on a coin flip, and we explicitly informed respondents that no response strategy can influence the probability of receiving either amount.

Additionally, we specified to respondents that their decisions need not mirror their IO's actual ISF payment behavior and that all responses are strictly confidential and will not be shared with the National Irrigation Commission (NIRC) or any government body. We complement the game by measures of altruism and reciprocity. The altruism task asks whether respondents would donate a one-time government cash transfer to a drought-affected IO and if so, specifies a transfer amount. The reciprocity task asks respondents whether they would purchase a thank-you gift for a stranger who helped them with directions in a hypothetical scenario.

The experimental task script and the game payoff section is presented in Appendix A, and the altruism and reciprocity tasks are described in Appendix B.

2.3 Data and Variables

Each respondent's game decisions generate five scenario-level observations—one for each peer payment level presented in Round 2—yielding a panel of 1,250 observations when we reshape the data from wide to long format. Some variables are defined at the scenario level and vary across peer scenarios within a respondent; others are aggregated to the individual level and are constant across the five observations for a given respondent. We describe each set of variables in turn.

Game outcome variables. The primary input to the game is the billed irrigation service fee, calculated as the IO's total irrigated area in the main season multiplied by TSH 50,000 per acre. The respondent's Round 1 decision—how much of the billed ISF they would choose to pay—is recorded as the unconditional payment percentage. This measure serves as the baseline against which all subsequent revision behavior is evaluated.

At the scenario level, the revision decision is a binary indicator equal to one if the respondent chose to alter their Round 1 payment upon observing the peer IO's payment in a given scenario. For respondents who revised, the revised payment percentage records the new amount both in Tanzanian Shillings and as a percentage of the billed ISF. For respondents who do not revise, the payment percentage remains same as the baseline percentage. We then construct the effective payment, defined as the revised payment if the respondent specified a modified payment in a given Round 2 scenario and the unconditional baseline payment otherwise. The effective payment percentage is the principal scenario-level outcome: it captures the respondent's final payment decision conditional on the peer signal, regardless of whether a formal revision occurred.

To characterize the direction and magnitude of revision behavior, we define two additional sets of variables. The peer gap measures the signed distance between the peer's payment percentage and the respondent's unconditional payment (i.e., the peer payment minus the unconditional payment), in percentage points, defined only for respondents who revised. A positive gap indicates that the peer paid more than the respondent initially chose; a negative gap indicates the reverse. At the individual level, we compute the smallest positive gap—the minimum peer percentage above the respondent's own unconditional payment that triggered an upward revision—and the largest negative gap—the maximum peer percentage below the respondent's unconditional payment that triggered a downward revision. These threshold measures identify the peer payment levels at which a respondent first becomes responsive to upward and downward signals, respectively.

Two scenario-level binary indicators capture the direction of revision. The first, move up, equals one if the peer's payment exceeded the respondent's unconditional payment and the respondent revised upward, i.e., specified a revised payment strictly greater than their unconditional amount. The second, move down, equals one if the peer's payment fell below the respondent's unconditional payment and the respondent revised downward. Both indicators are defined only for respondents who revised in a given scenario. At the individual level, we aggregate these into binary measures of whether the respondent ever revised upward or ever revised downward across the five peer scenarios.

We construct two further variables to facilitate the analysis of competing social preference theories. The first is payoff inequality, a scenario-level measure defined as the difference between the respondent's hypothetical payoff and the peer's hypothetical payoff, where payoff is the residual of the billed ISF after payment, i.e., the amount retained (or unpaid balance) by the IO after partial payment or evasion. Formally, payoff inequality equals (billed minus unconditional payment) minus (billed minus peer payment). Because the billed amount is the same for the respondent and the hypothetical peer, this simplifies to the peer's payment minus

the respondent's unconditional payment. Positive values indicate that the respondent retains more (pays less) than the peer, placing the respondent in an advantageous position relative to the hypothetical peer IO. This relative difference in payoff inequality forms the basis for inequity aversion as defined by Fehr and Schmidt's (2006). The second is the conformity index, a scenario-level measure of the degree to which a respondent's revision moves toward the peer's payment level. We define the index as the absolute change in the respondent's payment divided by the absolute distance between the peer's payment and the respondent's unconditional payment. Stated differently, the index is the ratio of |revised percentage minus unconditional percentage| to |peer percentage minus unconditional percentage|. This index is computed only for respondents who revised in scenarios where the peer's payment differs from the respondent's unconditional payment. A conformity index of one indicates full conformity: the respondent revised all the way to the peer's level. Values between zero and one indicate partial adjustment, while values exceeding one indicate that the respondent overshot the peer's payment. We compute individual-level means of the effective payment percentage, payoff inequality, and the conformity index by averaging across each respondent's five peer scenarios.

Finally, we classify respondents by their unconditional payment decision into five bins: 0–24 percent, 25–49 percent, 50 percent, 51–99 percent, and 100 percent. We chose the bins to distinguish respondents who pay nothing or near-nothing, those who pay below the equal split, those who choose the equal split exactly, those who pay above the equal split but short of full compliance, and those who pay the full billed amount.

Additional behavioral measures. Two outcomes from the survey capture individual-level social preferences that are independent of the game itself. The altruism indicator equals one if the respondent chose to donate a hypothetical one-time government transfer of TSH 50,000 to a low-income, drought-affected IO in another region, rather than redeeming the transfer as cash or applying it toward future fee obligations of their IO. The reciprocity indicator equals one if the respondent stated they would purchase a thank-you gift for a stranger who had helped them at personal cost, specifically, a stranger who walked the respondent to their destination in an unfamiliar city, forgoing TSH 2,500 in wages and refusing direct compensation. These measures provide independent proxies for two classes of social preference—altruism and positive reciprocity—that can be examined alongside the game outcomes to assess whether revision behavior reflects broader dispositional tendencies or is specific to the fee payment context.

Classifier variables. To examine heterogeneity in game behavior, we stratify the descriptive analysis by six covariates that capture variation in respondents' normative beliefs, scheme characteristics, and real-world compliance behavior. The first two classifiers are drawn from the norm elicitation module administered earlier in the survey. The injunctive norm indicator is a binary variable that captures the respondent's perception of the socially expected ISF payment level—that is, what IO leaders believe they ought to pay —is greater than 50 percent. The descriptive norm indicator, also a binary variable, captures whether the respondent's belief about the share of IOs that actually pay their irrigation service fees exceeds 50 percent. These two variables correspond to the standard distinction in the social norms literature between

injunctive norms (what one ought to do) and descriptive norms (what others actually do), as defined in Chapter 2.

The next two classifiers capture structural features of the respondent's irrigation scheme. The ISF rate indicator is a binary variable that distinguishes IOs whose billed ISF rate per acre is equal to or below TSH 50,0000, the latest irrigation fee rates per acre specified in NIRC's latest regulations. The irrigated area variable classifies IOs into quartiles based on total irrigated area, providing a measure of scheme scale.

The final two classifiers relate to compliance behavior. The unconditional payment category classifies respondents by their Round 1 game decision and thus captures the respondent's baseline willingness to pay in the experimental setting. The real-world ISF compliance indicator is a binary variable equal to one if the respondent's IO actually paid its irrigation service fee during the 2024 season—a measure of revealed compliance behavior outside the experimental context. Together, these last two classifiers enable comparison of game behavior between respondents who differ in both their stated and revealed payment propensities.

3. Descriptive Results

The descriptive analysis reveals two main findings. First, IO leaders start the game with high baseline compliance: the mean unconditional payment is approximately 71 percent of the billed ISF, and nearly half the sample—114 of 250 respondents—chose to pay the full billed amount in Round 1. Second, most IO leaders do not revise their initial decision upon observing a peer's payment. Only 23 percent of respondents altered their payment in any of the five peer scenarios, and the mean number of rounds with a revision is less than one. The modal response in the irrigation fee game, then, is static: the majority of respondents anchor to their unconditional payment and do not adjust it regardless of the peer signal presented. These two facts—high initial compliance and low responsiveness—establish the baseline against which we interpret all subsequent heterogeneity.

Peer effects: direction, magnitude, and concentration. Although the majority of respondents do not revise their payment decision in any of the Round 2 scenarios, the pattern among those who do is consistent across all six classifiers. Figures 1 through 6 plot mean effective payment against peer payment level for each classifier, and all six figures display upward-sloping profiles: effective payment increases monotonically as the peer's payment rises from 0 to 100 percent of billed ISF. The direction of the peer effect is unambiguous: respondents pay more when the peer pays more, but its magnitude is modest. Across most subgroups, the swing in mean effective payment from the lowest to the highest peer payment level spans approximately 5 to 10 percentage points, a range that is likely to be economically meaningful but far smaller than the 100-percentage-point variation in the hypothetical peer signal itself.

The scenario-level analysis in Table B1 clarifies where peer effects concentrate. Among respondents whose unconditional payment falls in the 51–99 percent bin, effective payment rises from 63 percent when the peer pays nothing to 75 percent when the peer pays in full, a statistically significant difference (F-test across peer levels, $p = 0.007$). The 50 percent group shows a similar pattern, with effective payment increasing from 47 to 55 percent ($p = 0.013$).

By contrast, respondents at the extremes of the unconditional payment distribution are largely unresponsive. Those who initially chose to pay 100 percent maintain effective payments between 95 and 100 percent across all five peer scenarios ($p = 0.077$)—a ceiling effect that leaves little room for upward movement. Those in the 0–24 percent bin show no significant variation ($p = 0.611$). The implication is that peer effects in the irrigation fee game operate primarily on the interior of the payment distribution, where respondents have scope to adjust in both directions, rather than at the tails, where initial choices limit the feasible range of revision.

Heterogeneity by social norms. The most striking source of heterogeneity across classifiers is the injunctive norm—the respondent's perception of what IO leaders ought to pay. Table A2 reveals that respondents with high injunctive norms (greater than 50%) state significantly higher unconditional payments than those with low injunctive norms (77 percent versus 47 percent, $p = 0.016$) and are significantly less likely to revise their decision in any round (12 percent versus 37 percent, $p = 0.014$). Figure 2 illustrates the consequence: high-norm and low-norm respondents occupy distinct levels of effective payment—separated by approximately 30 percentage points—that persist across the full range of peer payment levels. What the injunctive norm does not appear to do, however, is moderate the slope of the peer response. Within-group F-tests for effective payment across peer levels are insignificant in both subgroups ($p = 0.964$ for low norm; $p = 0.801$ for high norm), indicating that while the injunctive norm strongly predicts the level of payment, it does not visibly alter the sensitivity of payment to peer signals. Additionally, the direction of revision differs sharply between groups: among high-norm revisers, 78 percent revised upward in at least one round, compared with none of the low-norm revisers ($p < 0.001$). This asymmetry suggests that the behavioral meaning of revision differs across normative contexts—high-norm respondents revise to move closer to full compliance, while low-norm respondents revise exclusively downward.

The descriptive norm—the respondent’s perception of the average ISF compliance in their respective region— by contrast, exhibits no predictive power over any game outcome. Table A3 shows that respondents with high and low descriptive norms are statistically indistinguishable on unconditional payment (71 versus 71 percent, $p = 0.929$), revision propensity (22 versus 24 percent, $p = 0.730$), and mean effective payment (69 versus 70 percent, $p = 0.920$). Figure 3 confirms the null visually: the two groups' effective payment profiles overlap almost perfectly across all peer levels. This divergence between injunctive and descriptive norms is noteworthy. It implies that what IO leaders believe they ought to pay matters considerably for their game behavior. In contrast, what they believe other IO leaders actually do pay does not seem to have implications for their game behavior.

Real-world compliance and the aspiration gap. The classification by actual ISF compliance in 2024 exhibits a counterintuitive pattern. Table A6 shows that respondents whose IOs did not pay the ISF in 2024 state higher unconditional payments in the game than those whose IOs did pay (77 versus 66 percent, $p = 0.008$), and their mean effective payments are correspondingly higher across all peer scenarios (75 versus 65 percent, $p = 0.006$). This gap is visible in Figure

6, where the non-payer curve lies uniformly above the payer curve. The pattern is consistent with an aspiration or social desirability interpretation: respondents who did not comply in practice may be stating what they would like to pay, or what they believe they should pay, rather than what they would actually pay under similar circumstances. Importantly, neither group's effective payment varies significantly across peer levels ($p = 0.352$ for non-payers; $p = 0.416$ for payers), suggesting that the gap is a level effect rather than a difference in peer responsiveness. This finding warrants caution in interpreting the unconditional payment measure as a straightforward indicator of willingness to pay; it may capture normative aspirations as much as behavioral intentions.

Scheme classifiers: ISF rate and irrigated area. Two classifiers related to the structural characteristics of the irrigation scheme—the billed ISF rate per acre and total irrigated area—reveal patterns consistent with a cost-of-compliance interpretation. The latest fee per acre, as specified in NIRC regulations, is TSH 50,000. However, not all IOs have implemented these rates. Only 140 IOs (50 percent) in our sample have implemented the latest NIRC fee regulations. Respondents facing ISF rates lower than the official rates per hectare state higher unconditional payments than those facing the official rates (75 versus 67 percent, $p = 0.050$), and their mean effective payments are correspondingly higher (Table A4). Figure 4 shows that the high-rate group, although starting at a lower level, exhibits a slightly steeper upward slope across peer levels, suggesting greater peer responsiveness among those for whom the fee possibly represents a larger financial burden — though the within-group F-tests do not reach significance in either subgroup ($p = 0.645$ for low rate; $p = 0.222$ for high rate).

Table A5 and Figure 5 present a similar gradient by irrigated area. Respondents in the smallest quartile (Q1) state the highest unconditional payments (81 percent), while those in the third quartile state the lowest (63 percent), with the difference across quartiles jointly significant ($p = 0.010$). The payoff inequality measure varies dramatically by irrigated area—the Q4 group shows the largest absolute payoff differences across peer levels ($p = 0.001$ in Table A5)—reflecting the amplification of payment differences when billed amounts are large. For the analysis of peer effects in effective payment, however, none of the irrigated area subgroups show significant within-group variation across peer levels (Table B5, all $p > 0.46$), indicating that scheme scale shifts the level of payment behavior without detectably altering its sensitivity to peer signals.

Social preferences as non-differentiators. The altruism and reciprocity measures from Section H of the survey show limited variation across classifiers and no significant association with game behavior. Reciprocity is near-universal — approximately 90 percent of respondents across all subgroups report that they would purchase a thank-you gift for a helpful stranger — and does not differ significantly across any of the six classifiers (all $p > 0.30$ in Tables A1–A6). Altruism is less prevalent, with 15 to 25 percent of respondents choosing to donate the hypothetical windfall to a drought-affected IO. Still, it too fails to differentiate meaningfully across subgroups (all $p > 0.20$). The proposed empirical analysis will explore whether this reflects genuine homogeneity in social preferences, ceiling and floor effects in the respective measures, or insufficient variation to detect real differences at the present sample size

Conformity Index. Among the minority of respondents who do revise, the conformity index provides a measure of how far the revision travels toward the peer's payment level. Mean conformity across revisers ranges from approximately 0.7 to 1.0, indicating that the typical revision closes most or all of the distance between the respondent's unconditional payment and the peer's level. In some subgroups, the mean conformity index exceeds one, implying that certain respondents overshoot—revising beyond the peer's payment level rather than converging to it. These estimates, however, are based on a small number of revisers (approximately 57 respondents distributed across subgroups and peer scenarios) and should be interpreted with appropriate caution.

Taken together, the descriptive results suggest that peer effects in the irrigation fee game are real but circumscribed. They are positive in direction, modest in magnitude, and concentrated among respondents in the interior of the unconditional payment distribution. The injunctive norm emerges as the strongest predictor of game behavior, shaping both the level of payment and the direction of revision. In contrast, the descriptive norm, social preference measures, and several structural classifiers differentiate payment levels without detectably moderating the peer response. These patterns motivate a regression framework that can simultaneously control for respondent heterogeneity, identify the marginal effect of peer signals on payment decisions, and test whether the injunctive norm and other covariates interact with the peer signal to shift the slope, rather than merely the intercept, of the compliance response function.

Below, I expound on the proposed theoretical and empirical framework I plan to implement for this third chapter of my dissertation.

3. Proposed Theoretical Background and Empirical Framework

Rather than deriving a structural model ex ante and estimating its parameters, we first document reduced-form empirical patterns in the irrigation fee game and then evaluate whether various theories of social preferences can account for them. We adapt this approach from Thoni and Gachter (2015), who follow a ‘test and predict’ approach based on a lab-based experimental game. We propose an analysis in two stages. In the first stage, we summarize descriptive and regression evidence addressing three sequential questions about peer effects in the game data. In the second stage, we adapt the theoretical predictions of several canonical social preference models—originally derived for the three-person gift-exchange game of Thoni and Gachter (2015) and Gachter, Nosenzo, & Sefton (2013)—to the one-person irrigation fee game used in this study. The primary objective of the proposed analysis is to assess which theory is consistent with the empirical regularities.

3.1 Reduced form regressions

The reduced-form analysis is organized around three questions that go from the extensive margin to the intensive margin to the slope of the reaction function, summarizing the key patterns described in the descriptive analysis to motivate the regression-based formal estimation that follows.

Question 1: Do peer effects exist? The first question asks whether observing a peer's payment decision changes the respondent's own decision—the extensive margin of peer responsiveness.

The descriptive results establish that the modal response in the irrigation fee game is static: the large majority of respondents anchor to their unconditional payment and do not revise it in any of the five peer scenarios. This low revision rate stands against a backdrop of high baseline compliance intentions, with mean unconditional payments well above what deterrence-based models of compliance would predict. These two facts, high initial compliance and low responsiveness, circumscribe the scope for detectable peer effects and establish the baseline against which all subsequent heterogeneity must be interpreted. What the descriptive analysis cannot determine, however, is whether the low probability of revision masks significant variation across respondent types once individual-level covariates are held constant. The regression framework addresses this by estimating the marginal effect of the peer signal on the probability of revision conditional on respondent characteristics, and by testing whether that effect varies across subgroups defined by normative beliefs, unconditional payment category, and scheme structure.

Question 2: What direction do peer effects take? The second question moves to the intensive margin and asks how the peer signal shapes the level of payment among those who do revise their payment decision at least once in Round 2. The descriptive evidence is unambiguous in direction: effective payment rises monotonically with peer payment across all six classifiers examined above. The magnitude, however, is modest, with the full swing from the lowest to the highest peer level spanning only a fraction of the variation in the peer signal itself. Further, the effect is concentrated among respondents in the interior of the unconditional payment distribution, where there is scope to adjust in both directions. The descriptive analysis also reveals that the injunctive norm strongly predicts the level of payment but does not visibly moderate the slope of the peer response. This pattern requires formal interaction tests to confirm. Similarly, the counterintuitive finding that real-world non-compliers state higher game payments than real world compliers raises questions about what the unconditional payment measure captures and has implications for the interpretation of any regression coefficient on the peer signal. The fixed-effects and correlated random-effects specifications described below isolate the within-respondent effect of peer payment after controlling for confounding individual heterogeneity and test whether the injunctive norm and other classifiers shift the slope of the peer response or only its intercept.

Question 3: What is the slope of the reaction function? The third question asks how respondent i's payment responds to the distance between the peer's payment and the respondent's own unconditional level—that is, the slope of the reaction function. The descriptive evidence suggests that revisers close most or all of the gap between their unconditional payment and the peer's level but these estimates rest on a small number of revisers distributed across subgroups and peer scenarios. Descriptive means cannot distinguish whether the reaction function is symmetric i.e., whether respondents adjust equally to peers who pay more versus less than their own unconditional amount. Further, we cannot determine from descriptives alone whether the reaction function exhibits the asymmetric kink pattern documented by Thoni and Gachter (2015), in which downward revision dominates upward revision. The piecewise regression specification below directly estimates the slope in each

domain and tests for the kink, providing a formal basis for the theoretical reconciliation that follows.

3.2 Proposed Regression Framework

We propose the following regression specifications to address these limitations. All specifications exploit the within-respondent panel structure of the data, in which each of the 250 respondents contributes five scenario-level observations (one per peer payment level), and cluster standard errors at the respondent level to account for within-person correlation.

Specification 1: The decision to revise (extensive margin). The first specification models the binary revision decision using a probit:

$$\Pr(Revised_{ir} = 1) = \Phi(\beta_0 + \beta_1 * PeerPct_r + \alpha_i + \epsilon_{ir}) \qquad (1)$$

where $Revised_{ir}$ is a binary indicator equal to one if respondent i revised their Round 1 payment upon observing peer payment level r, $PeerPct_r$ is the peer's payment as a percentage of the billed ISF (taking values 0, 25, 50, 75, or 100), and α_i is an individual specific round invariant fixed effect which captures individual-level factors including the injunctive norm indicator, descriptive norm indicator, ISF rate, irrigated area quartile, altruism and reciprocity indicators, and unconditional payment category. The coefficient β_1 captures the marginal effect of the peer signal on the probability of revision. We will also estimate an extended version of the above specification by interacting $PeerPct_r$ with selected classifiers (particularly the injunctive norm and unconditional payment category) to test whether the sensitivity of the revision decision to peer signals varies across subgroups.

Specification 2: The effective payment level (intensive margin). The second specification models the effective payment percentage using OLS with respondent fixed effects:

$$EffPay_{ir} = \beta_0 + \beta_1 * PeerPct_r + \alpha_i + \epsilon_{ir} \qquad (2)$$

where $EffPay_{ir}$ is respondent i's effective payment in scenario r (equal to the revised payment if the respondent revised, and the unconditional payment otherwise) and α_i is a respondent fixed effect that absorbs all time-invariant individual heterogeneity — including the unconditional payment level, social preferences, normative beliefs, and scheme characteristics. The coefficient β_1 estimates the average marginal effect of the peer signal on effective payment, after 'netting out' individual-level variation. Because the peer payment levels are randomized in order of presentation, $PeerPct_r$ is exogenous conditional on respondent fixed effects.

We will estimate an extended version of the above specification using Correlated Random Effects (CRE) that interacts $PeerPct_r$ with key classifiers:

$$EffPay_{ir} = \beta_0 + \beta_1 * PeerPct_r + \beta_2 * Classifier_i^K + \beta_3 * (PeerPct_r \times Classifier_i) + \alpha_i + \epsilon_{ir} \qquad (3)$$

Where $Classifier^K\ is\ one\ of$ six classifier variables: injunctive norm measure, descriptive norm measure, updated per acre rate dummy, irrigated area quartiles, Round 1 payment category, and 2024-2025 fee compliance dummy.

The coefficient β_3 tests whether the classifier shifts the slope of the effective payment response to peer signals, as the descriptive evidence suggests the injunctive norm and unconditional payment category may do.

Specification 3: Slope of the reaction function. The third specification estimates the slope of the reaction function by regressing the revision amount on the signed distance between the peer's payment and the respondent's unconditional payment:

$$\Delta Pay_{ir} = \beta_0 + \beta_1 * Gap_{(ir)} + \epsilon_{(ir)} \qquad (4)$$

where $\Delta Pay_{ir} = EffPay_{ir} — UnconditionalPay_i$ is the change in payment from Round 1 to Round 2 for respondent i in scenario r, and $Gap_{(ir)} = PeerPct_{ir} - UnconditionalPayPct_i$ is the signed gap between the peer's payment and the respondent's unconditional payment, in percentage points. The slope coefficient β_1 is the key parameter of interest: it estimates the fraction of the peer-respondent gap that is closed by revision. A slope of zero indicates no peer effect; a slope of one indicates full conformity (the respondent revises all the way to the peer's level); and intermediate values indicate partial adjustment.

To test whether respondents respond differently to peers who pay more versus less than their own unconditional payment (asymmetry in the peer response), we will estimate the following specification:

$$\Delta Pay_{ir} = \beta_0 + \beta_1 * Gap_{(ir)} + \beta_2 * PosGap_{(ir)} + \beta_3 * I\big(Gap_{(ir)} > 0\big) + \gamma * X_i + \epsilon_{(ir)} \quad (5)$$

Where $\Delta Pay_{ir} = EffPay_{ir} — UnconditionalPay_i$ is the change in payment from Round 1 to Round 2 for respondent i in scenario r ; $PosGap_{(ir)} = max(Gap_{(ir)}, 0)$ is the positive part of the gap and I($Gap_{(ir)}$ >0) is an indicator for scenarios in which the peer paid more than the respondent's unconditional amount.

This specification allows the relationship between the $Gap_{(ir)}$ (difference between peer payment and the respondent's Round 1 payment) and the Round 2 payment revision to differ depending on whether the gap is positive or negative. β_1 captures the slope of the reaction function in the negative domain (peer paid less), and $\beta_1 + \beta_2$ captures the slope in the positive domain (peer paid more). A significant and negative β_2 would indicate that the positive-domain slope is flatter than the negative-domain slope, indicating that respondents revise downward in response to low peer payments but do not revise upward in response to high peer payments. β_3 equals one when the gap is positive and zero otherwise. Consequently, β_3 allows the predicted payment adjustment to make a discrete jump when the gap crosses from nonpositive to positive. This means that β_3 captures a potentially distinct behavioral reaction to the sign of the gap, separate from the size of the gap. For example, individuals might react differently as soon as they learn that a peer paid more than they did, even when the numerical difference is very small.

Specification 4: Direction of revision. Finally, we will model the direction of revision using separate probits for the move-up and move-down indicators:

$$Pr\big(MoveUp_{(ir)} = 1\big) = \Phi\big(\beta_0 + \beta_1 * PeerPct_r + \gamma * X_i + \epsilon_{(ir)}\big) \qquad (6)$$

$$Pr\left(MoveDown_{(ir)} = 1\right) = \Phi\left(\beta_0 + \beta_1 * PeerPct_r + \gamma * X_i + \epsilon_{(ir)}\right) \qquad (7)$$

These specifications test whether higher peer payment levels increase the probability of upward revision and decrease the probability of downward revision, and whether covariates such as the injunctive norm differentially predict the direction of adjustment.

3.3 Theoretical Predictions

The second stage of the analysis evaluates whether established theories of social preferences can account for the empirical patterns documented above. We adapt the theoretical framework of Thoni and Gachter (2015), who derive best-reply predictions from several models of social preferences organized in three classes—distributional preferences, reciprocity, and hybrid models—from the three-person gift-exchange game to the one-person irrigation fee game used in this study.

Our irrigation fee game differs from Thoni and Gachter's setup in two important aspects. First, there is no principal whose payoff depends on both agents' decisions. Respondent i and hypothetical peer j each face a billed ISF of equal magnitude, and each player's payoff depends only on their own payment decision. This eliminates the channel through which altruism over total surplus and reciprocity based on payoff interdependence generate predictions in Thoni and Gachter's framework. Second, the peer is hypothetical rather than real. Respondents observe a stated payment level for a peer IO described as identical to their own, but they do not interact with an actual decision-maker. This further undermines the applicability of reciprocity and belief-based models that require attributing intentions to a real agent. A hypothetical peer, by construction, has no intentions to evaluate. The only channel through which a peer effect can arise in this setting, then, is through models in which the respondent's utility depends directly on the comparison between own payoff and the peer's payoff — that is, through distributional preference[1].

Distributional preferences: altruism and inequity aversion. First, we will consider distributional preference models in which respondent i's utility function $u_i(x_i, x_j)$ takes as arguments respondent i's monetary earnings and those of hypothetical peer j. The models vary based on the assumption of the sign and magnitude of the derivative of u_i with respect to x_j. Altruism models assume the derivative is positive, i.e., respondent i gains utility when peer j's payoff, x_j, increases. On the other hand, inequity aversion models assume the derivative is negative when peer j is poorer than i, i.e., respondent i experiences disutility when peer j's

[1] Despite its limitations, we designed the game to include hypothetical peers since it closely reflects the actual irrigation fee payment ecosystem in Tanzania. Most IOs in our sample are not aware of the decisions of other peer IOs in general, and specifically, during the fee remittance process they do not observe peer IO decisions given the large distances between irrigator organizations. Anecdotal information collected by our survey team further corroborates this view. During survey piloting, the survey team found it challenging to elicit respondent's unconditional beliefs about peer IOs (in the descriptive norm question) since most IO Leader were not familiar with peer leaders and did not want to speculate about their decisions.

payoff. x_j increases. Specifically, we will derive predictions from three models: the CES altruism model of Cox, Friedman, and Gjerstad (2007), the hybrid model of Charness and Rabin (2002), and the inequity aversion model of Fehr and Schmidt (1999).

We will derive predictions for each model in the following manner:

i. We assume respondent i maximizes a utility function $u_i(x_i, x_j)$ subject to constraints defined by the money retained by partial evasion, i.e., the amount saved by not paying the irrigation bill in full
ii. We will plot the choice sets and indifference curves for each model to characterize the respondent's optimal payment as a function of the peer's payment level.
iii. We will derive and plot the corresponding reaction function. We will begin with a Constant Elasticity of Substitution (CES) utility function, which assumes a continuously variable rate of substitution between own payoff and peer payoff, as a general functional form for both altruism and inequity aversion specifications. We will also explore alternative functional forms for the reaction function.
iv. We will compare the theoretically predicted reaction function slopes, their sign, magnitude, and symmetry properties, against the empirically estimated slopes from the regression specifications described above, and assess which class of model, if any, is consistent with the observed patterns of peer responsiveness in the irrigation fee game.

Incorporating survey-elicited social preferences. The structural features of the irrigation fee game like the absence of payoff interdependence and the hypothetical nature of the peer preclude reciprocity and belief-based models from generating peer effects through their standard channels. Yet our survey data provide independent measures of altruism and reciprocity for each respondent: the government donation task and the gift-purchase task, respectively. These measures cannot be incorporated into the two-agent models of payoff interdependence and shared production functions that employ them, since their framework reveals social preference types through observed pairwise interactions between real agents. I intend to explore alternative theoretical approaches, drawing on the literature surveys in Sobel (2005) and Fehr and Schmidt (2006), that can accommodate individual-level measures of prosocial motivation as covariates or type indicators within the distributional preference framework developed above.

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Chapter 3: Appendix A. Experimental Task Script and Sections

Introductory Note

'"In the following Activity, I will describe an imaginary scenario about the irrigation service fee (IRRIGATION SERVICE FEE (ISF) charged to your irrigator organization (IO) for the 2024-2025 cropping season. This section consists of two rounds. In each round, you will be asked to make a hypothetical decision about the IRRIGATION SERVICE FEE (ISF) payment for your IO. Depending on your responses, you may receive Tsh 5,000 or Tsh 2,500 after the completion of this section. Let me explain the rules for receiving this cash.

At the end of round two, we will do a coin flip. You will first be asked to select heads or tails. If your answer matches the outcome of the coin toss (heads or tails), you will receive Tsh 5,000 via mobile money. For example, if you select 'heads' and the coin lands on 'heads', you will receive Tsh 5,000 via mobile money. However, if your answer is different from the outcome of the coin toss, you will receive Tsh 2,500 via mobile money. For example, if you select 'tails' and the coin lands on 'heads', then you will receive Tsh 2,500 via mobile money

However, please note that this is not a ‘game’ where you can use a strategy to win money. There is no strategy that will increase your chance of receiving the money. For example, saying you will pay the full amount (100%) will not increase your chances of receiving the money. Similarly, if you say you will not pay any fees (0%), that will not reduce your chances of receiving money. There is no relationship between your answers and the money you receive. I encourage you to approach this Activity as if you were making a real-world decision about the IRRIGATION SERVICE FEE (ISF) payment for your IO, with a chance that you may receive some cash for participating in this activity based on the rule I just explained. If your 'heads' or 'tails' selection matches the outcome of the coin toss, then you will receive payments after you complete the survey.

Do you have any questions? Do you understand the rules of this Activity?

<Enumerator: Please answer any questions the respondent may have. Then proceed>

'Before we begin this Activity, I would like to highlight two important points.

- First, the decisions you make in these scenarios do not have to mirror your IO’s real-life decision regarding IRRIGATION SERVICE FEE (ISF) payment in 2024-2025. You are free to make your decision irrespective of the amount of IRRIGATION SERVICE FEE (ISF) you paid during the above period. To reiterate, your decision regarding IRRIGATION SERVICE FEE (ISF) payment can be the same as your IOs in 2024-2025, or it can be different. However, what is important for this Activity is that you make your decision after considering all the information and assumptions I read out to you at the beginning of each round.

- Second, any decisions you make or information you share in this section will not have an impact on your IRRIGATION SERVICE FEE (ISF) payment status for the 2024-2025 cropping season or any previous or future cropping seasons. As mentioned during the start of the survey, your responses will not be shared with NIRC or any other governmental or parastatal organizations. Further, only the research team will be able to view your data. Even when the research team uses the data, they will not use your data individually. Instead, they will analyse the responses of all IO leaders who take part in this survey as a whole.

Please let me know if you have any questions or need more clarification.

If you have no further questions, let us now begin this Activity.”

ROUND 1

Note : “This is the beginning of round one. Please listen to the following instructions carefully.

Consider the irrigation service fee (IRRIGATION SERVICE FEE (ISF)) that was charged to your irrigator organization (IO) for the 2024-2025 cropping season. For this task, let us consider only the fee for the 2024-2025 main cropping season, i.e., total irrigated area multiplied by Tsh 50,000 per acre. As a reminder, for your IO, that amounts to Tsh _____ for the 2024-2025 cropping seasons. Assume that all other IO-related expenses, such as maintenance, administration, and monitoring, remain at the same level as in the 2024-2025 cropping season.

Furthermore, assume that you have successfully collected contributions/payments from all the members of your IO.

g1	How much of the IRRIGATION SERVICE FEE (ISF) will you choose to pay? Please specify answer in TSH
g1_note	Please note the amount you mentioned corresponds to ____% of the total billed amount for 2024-2025

ROUND 2

Note: Consider an irrigation scheme that is identical to your own irrigation scheme in terms of irrigated area and crop cultivated. Further, assume the IO incurs similar additional costs as your IO (administrative, maintenance, operational costs, etc). Like your scheme, they are billed TSH_____ for the 2024-2025 cropping season. Now, assume that you can observe the IO's decision regarding IRRIGATION SERVICE FEE (ISF) payment, i.e., you know the amount of IRRIGATION SERVICE FEE (ISF) the imaginary IO decides to pay. In each of the following scenarios, please specify if you would alter your fee payment decision from Round One in response to the imaginary IO's decision.

The following questions are presented in a random order for each survey participant

g2	The IO pays TSH _____ (0% of the ISF) (no payment made).	Response Option
	Would you alter the your payment decision in round 1 after observing the imaginary IO's decision?	(Yes=1, No=2)
g3	How much would you choose to pay now ? (in TSH)	numeric
g4	The IO pays TSH_____ (25% of the billed ISF)	(Yes=1, No=2)
	Would you alter your previous payment decision after observing the IO's decision?	(Yes=1, No=2)
g5	How much would you choose to pay now ? (in TSH)	numeric
g6	The IO pays TSH _____ (50% of the ISF)	select one
	Would you alter your previous payment decision after observing the IO's decision?	(Yes=1, No=2)
g7	How much would you choose to pay now ? (in TSH)	numeric
g8	The IO pays TSH _____ (75% of the ISF)	(Yes=1, No=2)
	Would you alter your previous payment decision after observing the IO's decision?	select one
g9	How much would you choose to pay now ? (in TSH)	numeric
g10	The IO pays TSH _____ (100% of the ISF (full payment))	select one
	Would you alter your previous payment decision after observing the IO's decision?	(Yes=1, No=2)
g11	How much would you choose to pay now ? (in TSH)	numeric

Game Payoff Section

[Enumerator Instruction]: Now ask the respondent to select 'heads' or 'tails'. Then write their selection on a piece of paper and show it to the respondent.
Enumerator : Please specify the respondent's selection
[Enumerator Instruction]: Now show the respondent the coin you will use in the coin toss. Indicate clearly which side is heads and which side is tails.
[Enumerator Instruction]: Now flip coin in such a way that it lands in such a way that the outcome (heads or tails) is clearly visible to the respondent.
Enumerator: Please specify the outcome of the coin toss
"You will receive Tsh 5,000 for this task. You will receive the payment after survey completion."
"You will receive Tsh 2,500 for this task. You will receive the payment after survey completion. "

Chapter 3: Appendix B: Altruism and Reciprocity tasks

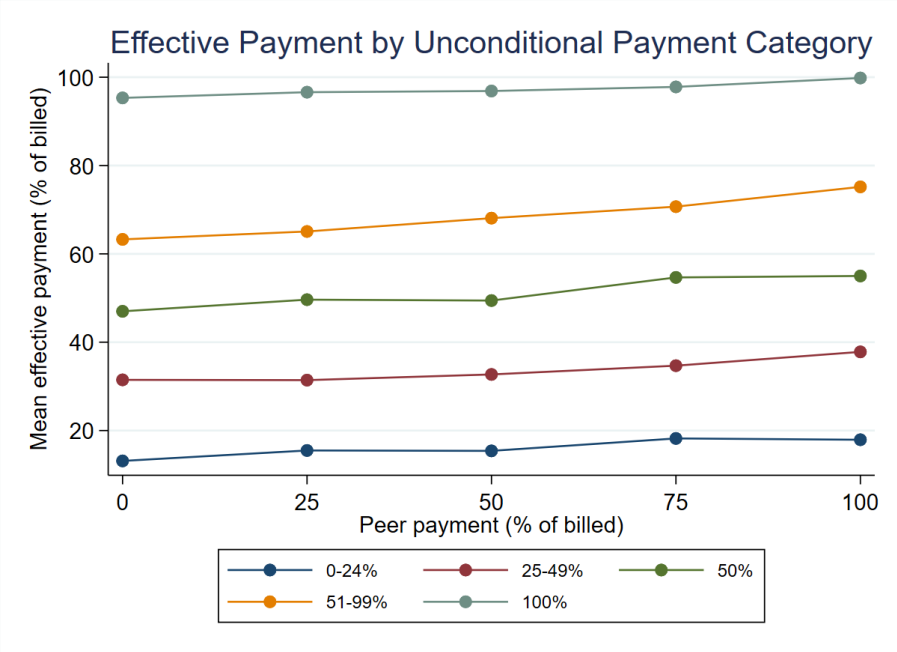
Task 1: Altruism
H1. Consider the following scenario, consider that your IO receive a one-time transfer of Tsh 50,000 as a good will gesture from the government to IOs. You can redeem this transfer as cash, or as a deduction from the irrigation fees for the next cycle. You can also choose to donate this transfer to a low-income drought-affected IO in another region in Tanzania. Which of the following would you choose: a. Receive Tsh 50,000 in cash b. Deduct Tsh 50,000 from future ISF/AF payments c. Donate Tsh 50,000 or a smaller amount to a low-income drought affected IO
H2. How much of the Tsh 50,000 would you donate to the low-income IO ?
H3. How would you choose to donate the amount to the low-income IO ? A. Deduct TSH (amount from h2) from the IO's ISF/AF bill B. Give TSH (amount from h2) as cash

Task 2: Reciprocity

H4. Consider the following scenario: You are in a city you are not familiar with, and you realize you lost your way. You ask a stranger for directions. The stranger offers to walk with you and show you the way to your destination. By helping you the stranger misses an hour of work and thus loses 2500 TSH in total. However, the stranger says he or she does not want any money from you. When you arrive to your destination, you can buy a gift for the stranger in a shop.
H5. Do you buy a "thank-you" gift for the stranger ? (Yes =1, No = 0)
H6. How much money will you spend on the present ?

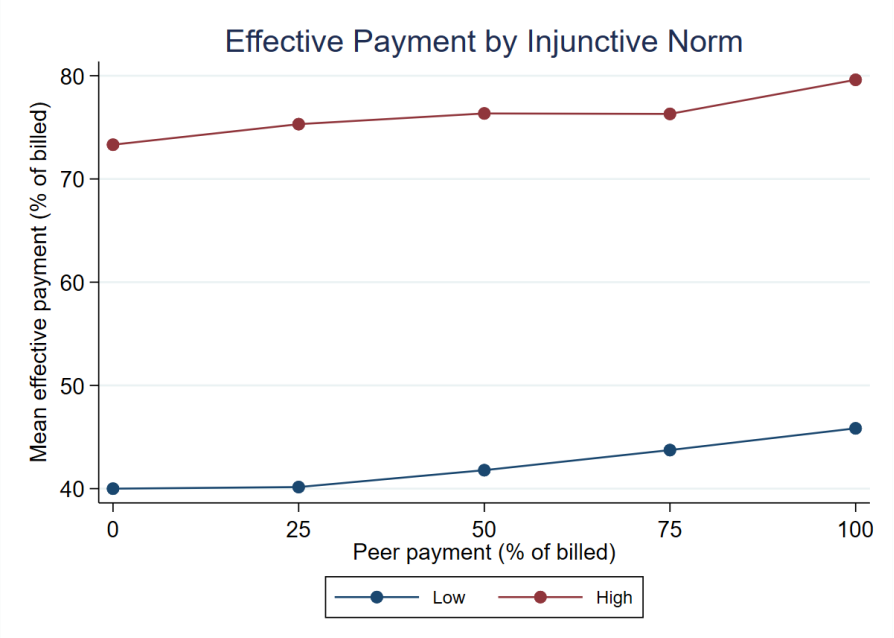
Chapter 3: Figures

Fig 1: Effective Payment by Unconditional Payment Category;



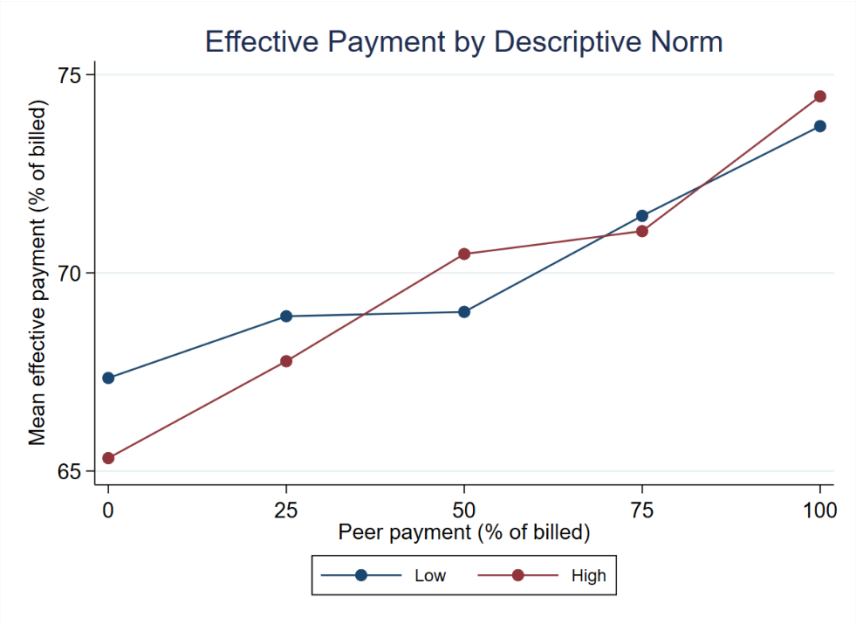
Note: Unconditional payment category: respondent's Round 1 ISF payment as a percentage of billed ISF, grouped into five bins: 0-24%, 25-49%, 50%, 51-99%, 100%.

Fig 2: Effective Payment by Injunctive Norm



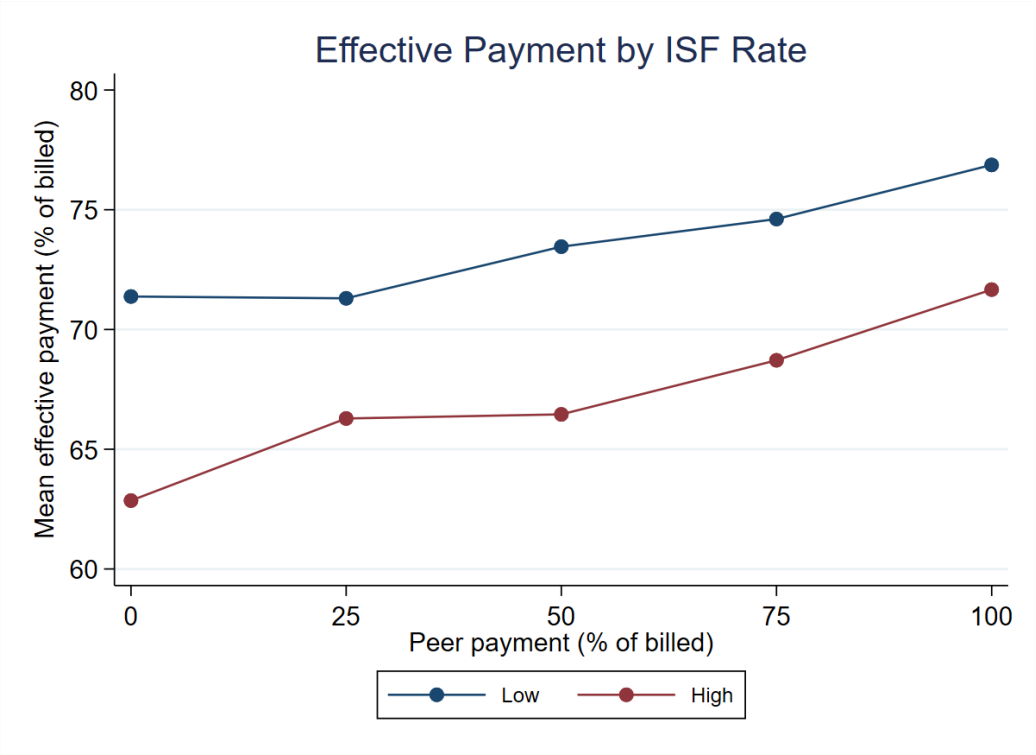
Note: Injunctive norm (binary): respondent's perception of the socially expected ISF payment level. Low = below 50%; High = above 50%.

Fig 3: Effective Payment by Descriptive Norm



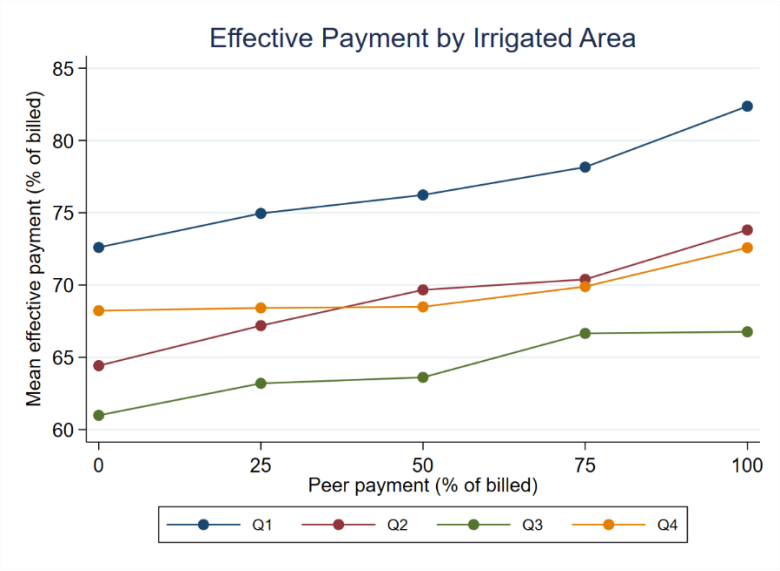
Note: Descriptive norm (binary): respondent's belief about
the share of IO members who actually pay ISF. Low = below 50%; High = above 50%.

Fig 4: Effective Payment by ISF Rate



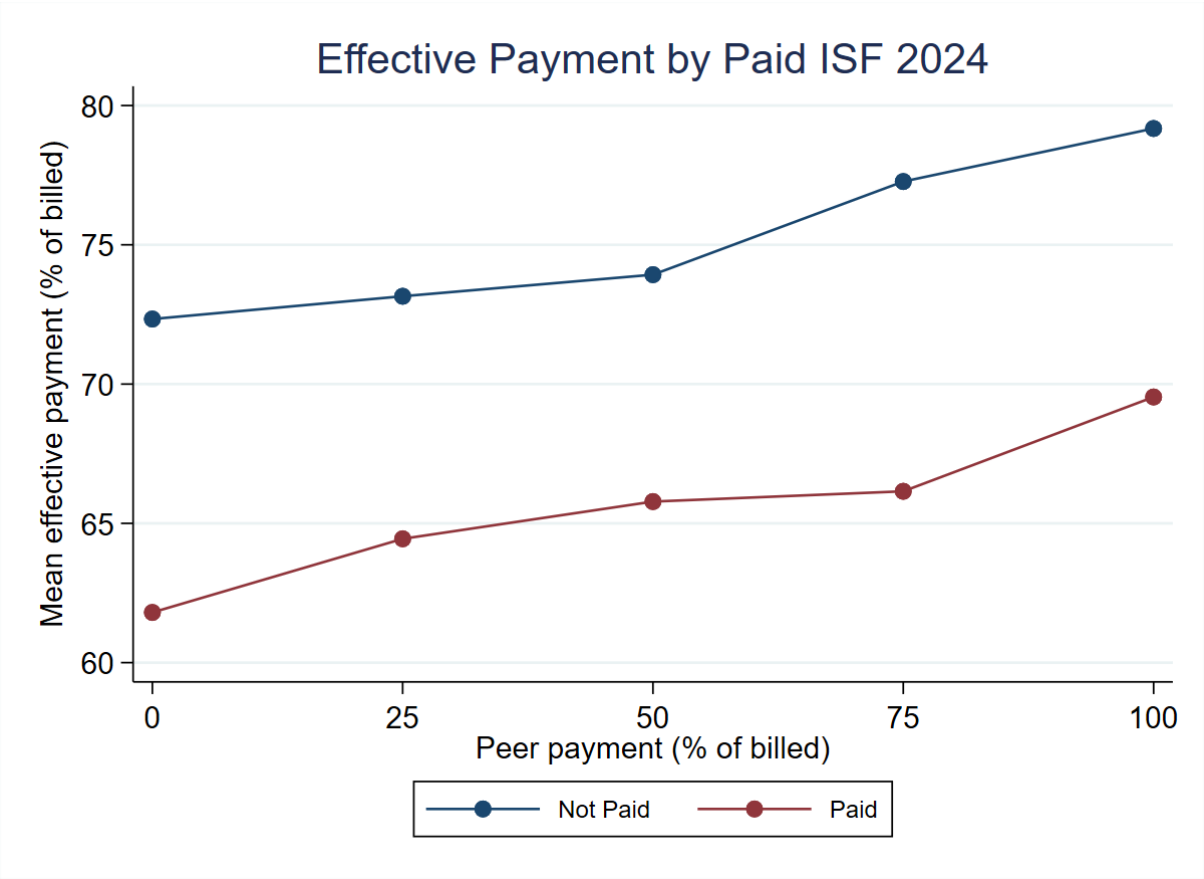
Note: ISF rate (binary) whether the IO's billed ISF rate per hectare is above or below the latest NIRC rates. Low = below ; High = current rate.

Fig 5: Effective Payment by Irrigated Area



Note: Irrigated area quartile: total irrigated area of the IO, split into four quartiles. Q1 = smallest irrigated area; Q4 = largest

Fig 6: Effective Payment by Paid ISF 2024



Note: Irrigated area quartile: total irrigated area of the IO, split into four quartiles. Q1 = smallest irrigated area; Q4 = largest

Chapter 3: Table Section A

Table A1: Individual-Level Descriptives by Unconditional Payment Category

	25-49%			50%			51-99%	
	N	Mean	SD	N	Mean	SD	N	Mean	SD
1	41	32.22	7.41	30	50.00	0.00	45	71.43	12.09
1	41	0.37	0.49	30	0.30	0.47	45	0.24	0.43
7	41	0.85	1.37	30	0.67	1.30	45	0.91	1.74
3	14	0.71	0.47	9	0.78	0.44	11	0.64	0.50
2	14	0.43	0.51	9	0.56	0.53	11	0.82	0.40
8	11	26.92	25.57	6	16.67	12.91	3	17.57	8.04
	4	-19.57	14.63	1	-25.00		7	-10.96	4.24
1	41	33.41	9.92	30	51.15	4.47	45	68.24	13.01
47.54	41	4,874,237.95	9,653,395.90	30	1,666.61	9,128.42	45	-7,786,500.00	12,132,319.12
6	14	0.98	0.47	9	0.83	0.26	11	0.97	0.74
7	41	0.27	0.45	30	0.30	0.47	45	0.22	0.42
1	41	0.88	0.33	30	0.90	0.31	45	0.93	0.25

Notes: IO leader sample (N=250), one observation per respondent.
Classifier: Unconditional payment category: respondent's Round 1 ISF payment as a percentage of billed ISF, grouped into five bins: 0-24%, 25-49%, 50%, 51-99%, 100%.
P-value from F-test of joint equality across groups.
Effective payment: revised amount if revised, otherwise unconditional, averaged across five peer scenarios.
Conformity: |revised% - unconditional%| / |peer% - unconditional%|, defined for revisers where peer != unconditional.

Payoff inequality: respondent's payoff minus peer's payoff.
Altruistic: donated part of hypothetical TSh 50,000 transfer to drought-affected IO.
Reciprocal: would buy thank-you gift for helpful stranger.

Table A2: Individual-Level Descriptives by Injunctive Norm

	Low			High			
	N	Mean	SD	N	Mean	SD	P-value
Unconditional payment (% of billed ISF)	19	46.89	29.68	75	76.63	28.73	0.016
Revised payment in any round (=1)	19	0.37	0.50	75	0.12	0.33	0.014
Number of rounds with revision	19	0.74	1.28	75	0.41	1.19	0.230
Revised upward in any round (=1)	7	0.00	0.00	9	0.78	0.44	0.000
Revised downward in any round (=1)	7	0.86	0.38	9	0.89	0.33	0.575
Smallest positive peer gap triggering revision (pp)	2	7.50	3.54	4	26.40	28.20	0.362
Largest negative peer gap triggering revision (pp)	3	-14.37	10.96	5	-22.52	10.28	0.415
Mean effective payment (%	19	42.30	27.50	75	75.58	29.71	0.002

of billed)							
Mean payoff inequality (self minus peer)	19	1,666,447.37	3,621,473.51	75	-6,214,583.25	25,212,077.13	0.097
Mean conformity index	7	1.21	0.56	9	0.88	0.50	0.703
Altruistic (=1)	19	0.05	0.23	75	0.15	0.36	0.610
Reciprocal (=1)	19	0.79	0.42	75	0.91	0.29	0.303

Notes: IO leader sample (N=250), one observation per respondent.
Classifier: Injunctive norm (binary): respondent's perception of the socially expected ISF payment level. Low = below 50%; High = above 50%.
P-value from F-test of equality across groups.
Effective payment: revised amount if revised, otherwise unconditional, averaged across five peer scenarios.
Conformity: |revised% - unconditional%| / |peer% - unconditional%|, defined for revisers where peer != unconditional.
Payoff inequality: respondent's payoff minus peer's payoff.
Altruistic: donated part of hypothetical TSh 50,000 transfer to drought-affected IO.
Reciprocal: would buy thank-you gift for helpful stranger.

Table A3: Individual-Level Descriptives by Descriptive Norm

	Low			High			
	N	Mean	SD	N	Mean	SD	P-value
Unconditional payment (% of billed ISF)	159	70.90	31.23	91	70.53	32.27	0.929
Revised payment in any round (=1)	159	0.24	0.43	91	0.22	0.42	0.730
Number of rounds with revision	159	0.65	1.36	91	0.51	1.17	0.384
Revised upward in any round (=1)	37	0.46	0.51	20	0.60	0.50	0.320
Revised downward in any round (=1)	37	0.70	0.46	20	0.55	0.51	0.257
Smallest positive peer gap triggering revision (pp)	19	21.19	17.64	9	32.01	28.75	0.228
Largest negative peer gap triggering revision (pp)	15	-17.27	9.71	6	-26.83	12.14	0.072
Mean effective payment (% of billed)	159	69.70	30.63	91	69.29	30.64	0.920
Mean payoff inequality (self minus peer)	159	-6,448,218.25	25,481,442.34	91	-2,261,332.35	16,906,306.83	0.163
Mean	37	1.00	0.61	2	0.73	0.28	0.06

conformity index				0			2
Altruistic (=1)	15 9	0.18	0.38	9 1	0.24	0.43	0.21 3
Reciprocal (=1)	15 9	0.91	0.29	9 1	0.92	0.27	0.64 2

Notes: IO leader sample (N=250), one observation per respondent.
Classifier: Descriptive norm (binary): respondent's belief about the share of IO members who actually pay ISF. Low = below 50%; High = above 50%.
P-value from F-test of equality across groups.
Effective payment: revised amount if revised, otherwise unconditional, averaged across five peer scenarios.
Conformity: |revised% - unconditional%| / |peer% - unconditional%|, defined for revisers where peer != unconditional.
Payoff inequality: respondent's payoff minus peer's payoff.
Altruistic: donated part of hypothetical TSh 50,000 transfer to drought-affected IO.
Reciprocal: would buy thank-you gift for helpful stranger.

Table A4: Individual-Level Descriptives by ISF Rate

	Low			High			
	N	Mean	SD	N	Mean	SD	P-valu

							e
Unconditional payment (% of billed ISF)	110	75.17	29.89	140	67.30	32.48	0.050
Revised payment in any round (=1)	110	0.20	0.40	140	0.26	0.44	0.290
Number of rounds with revision	110	0.51	1.19	140	0.67	1.38	0.326
Revised upward in any round (=1)	22	0.41	0.50	35	0.57	0.50	0.240
Revised downward in any round (=1)	22	0.77	0.43	35	0.57	0.50	0.125
Smallest positive peer gap triggering revision (pp)	8	9.64	9.34	20	30.68	22.69	0.018
Largest negative peer gap triggering revision (pp)	10	-17.09	8.61	11	-22.65	12.73	0.261
Mean effective payment (% of billed)	110	73.51	29.89	140	66.43	30.85	0.069
Mean payoff inequality (self minus peer)	110	-6,908,977.27	27,825,064.35	140	-3,364,717.47	17,824,754.19	0.223
Mean conformity index	22	0.84	0.27	35	0.94	0.64	0.500
Altruistic (=1)	110	0.23	0.42	140	0.18	0.38	0.341

Reciprocal (=1)	110	0.93	0.26	140	0.90	0.30	0.452

Notes: IO leader sample (N=250), one observation per respondent.
Classifier: ISF rate (binary): whether the IO's billed ISF rate per hectare is above or below the latest NIRC rates. Low = below ; High = current rate.
P-value from F-test of equality across groups.
Effective payment: revised amount if revised, otherwise unconditional, averaged across five peer scenarios.
Conformity: |revised% - unconditional%| / |peer% - unconditional%|, defined for revisers where peer != unconditional.
Payoff inequality: respondent's payoff minus peer's payoff.
Altruistic: donated part of hypothetical TSh 50,000 transfer to drought-affected IO.
Reciprocal: would buy thank-you gift for helpful stranger.

Table A5: Individual-Level Descriptives by Irrigated Area

	Q1			Q2			Q3			Q4			
	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	P-value
Unco	6	81.2	28.9	6	67.5	31.3	6	63.3	32.8	6	70.64	30.98	0.

nditional payment (% of billed ISF)	4	5	3	3	0	0	2	7	1	1			0.10
Revised payment in any round (=1)	64	0.19	0.39	63	0.24	0.43	62	0.31	0.46	61	0.20	0.40	0.383
Number of rounds with revision	64	0.62	1.42	63	0.57	1.25	62	0.63	1.16	61	0.57	1.36	0.991
Revised upward in any round (=1)	12	0.17	0.39	14	0.64	0.50	19	0.53	0.51	12	0.67	0.49	0.048
Revised downward in any round (=1)	12	1.00	0.00	14	0.57	0.51	19	0.53	0.51	12	0.58	0.51	0.037
Smallest positive peer gap	2	11.35	16.05	11	17.69	22.40	8	29.60	17.72	7	33.81	25.12	0.336

triggering revision (pp)												
Largest negative peer gap triggering revision (pp)	9	-23.40	12.22	1	-13.60	-	6	-13.67	8.71	5	-22.76	10.62	0.344
Mean effective payment (% of billed)	64	76.40	29.38	63	68.16	30.70	62	63.91	30.82	61	69.52	30.79	0.141
Mean payoff inequality (self minus peer)	64	-1,017,578.12	1,071,343.26	63	-1,592,658.73	2,798,805.04	62	-2,027,608.06	5,615,495.82	61	-15,407,766.32	44,337,104.51	0.001
Mean conformity index	12	0.93	0.42	14	0.95	0.45	19	0.97	0.68	12	0.73	0.44	0.654
Altruistic (=1)	64	0.19	0.39	63	0.22	0.42	62	0.19	0.40	61	0.20	0.40	0.965
Reciprocal (=1)	64	0.95	0.21	63	0.90	0.30	62	0.89	0.32	61	0.90	0.30	0.587

Notes: IO leader sample (N=250), one observation per respondent.

Classifier: Irrigated area quartile: total irrigated area of the IO,
split into four quartiles. Q1 = smallest irrigated area; Q4 = largest.
P-value from F-test of joint equality across groups.
Effective payment: revised amount if revised, otherwise unconditional, averaged across five peer scenarios.
Conformity: |revised% - unconditional%| / |peer% - unconditional%|, defined for revisers where peer != unconditional.
Payoff inequality: respondent's payoff minus peer's payoff.
Altruistic: donated part of hypothetical TSh 50,000 transfer to drought-affected IO.
Reciprocal: would buy thank-you gift for helpful stranger.

Table A6: Individual-Level Descriptives by ISF Compliance (2024)

	Not Paid			Paid			
	N	Mean	SD	N	Mean	SD	P-value
Unconditional payment (% of billed ISF)	115	76.51	29.19	135	65.86	32.74	0.008
Revised payment in any round (=1)	115	0.24	0.43	135	0.22	0.42	0.693

Number of rounds with revision	115	0.65	1.35	135	0.56	1.25	0.558
Revised upward in any round (=1)	28	0.43	0.50	29	0.59	0.50	0.242
Revised downward in any round (=1)	28	0.71	0.46	29	0.59	0.50	0.320
Smallest positive peer gap triggering revision (pp)	11	15.22	13.16	17	30.79	24.47	0.065
Largest negative peer gap triggering revision (pp)	11	-20.49	12.62	10	-19.46	9.71	0.837
Mean effective payment (% of billed)	115	75.26	27.91	135	64.68	31.97	0.006
Mean payoff inequality (self minus peer)	115	-7,054,775.67	29,034,022.48	135	-3,109,249.96	15,516,688.83	0.173
Mean conformity index	28	0.98	0.56	29	0.83	0.50	0.292
Altruistic (=1)	115	0.17	0.37	135	0.23	0.42	0.206
Reciprocal (=1)	115	0.91	0.28	135	0.91	0.29	0.957

Notes: IO leader sample (N=250), one observation per respondent.
Classifier: Real-world ISF compliance (binary): whether the respondent's IO actually paid its irrigation service fee in the 2024 season.
Not Paid = IO did not pay ISF; Paid = IO paid ISF.
P-value from F-test of equality across groups.
Effective payment: revised amount if revised, otherwise unconditional, averaged across five peer scenarios.

Conformity: |revised% - unconditional%| / |peer% - unconditional%|, defined for revisers where peer != unconditional.
Payoff inequality: respondent's payoff minus peer's payoff.
Altruistic: donated part of hypothetical TSh 50,000 transfer to drought-affected IO.
Reciprocal: would buy thank-you gift for helpful stranger.

Chapter 3: Table Section B

Table B1: Scenario-Level Descriptives by Unconditional Payment Category

	Peer 0%	**Peer 25%**	**Peer 50%**	**Peer 75%**	**Peer 100%**	P-value
Panel A: Eff. payment - 0-24%	13.12	15.49	15.39	18.22	17.92	0.611
(SD)	11.05	10.34	10.44	11.58	13.66	
25-49%	31.48	31.41	32.71	34.69	37.81	0.176
(SD)	11.34	9.34	10.78	14.14	18.04	
50%	47.00	49.63	49.43	54.67	55.00	0.013
(SD)	11.16	6.87	9.06	11.14	13.77	

51-99%	63.28	65.07	68.09	70.69	75.17	0.007
(SD)	21.15	18.69	13.39	13.13	13.83	
100%	95.32	96.61	96.88	97.80	99.82	0.077
(SD)	16.80	14.62	12.13	9.95	1.88	
Observations	252.00	243.00	242.00	242.00	243.00	
Panel B: Payoff ineq. - 0-24%	-5,454,700.00	4,489,115.00	15,319,121.05	24,852,215.00	36,593,436.84	0.005
(SD)	11,481,268.91	7,408,119.96	26,424,221.73	44,526,028.28	64,524,060.30	
25-49%	-9,991,310.73	-2,551,351.35	5,684,966.38	13,921,283.89	22,157,601.41	0.000
(SD)	20,603,328.98	7,289,487.64	9,804,599.17	24,361,348.44	39,308,676.27	
50%	-18,568,333.33	-9,283,333.60	1,666.67	9,286,666.67	18,571,666.67	0.000
(SD)	30,589,034.08	15,291,992.29	9,128.71	15,302,099.36	30,599,141.96	
51-99%	-23,463,722.22	-15,752,954.36	-7,736,193.18	280,568.18	8,297,329.55	0.000
(SD)	33,858,600.80	23,110,561.22	12,267,833.17	4,237,803.56	11,682,286.32	
100%	-23,793,478.26	-18,222,656.25	-12,152,901.79	-6,125,563.06	0.00	0.000
(SD)	55,600,548.55	42,192,640.24	28,126,641.09	14,117,448.67	0.00	
Observations	252.00	243.00	242.00	242.00	243.00	
Panel C: Peer gap - 0-24%	-10.88	13.40	35.88	64.36	88.38	0.000
(SD)	3.82	7.66	6.71	5.29	5.55	
25-49%	-34.32	-11.84	13.61	40.04	65.43	0.000
(SD)	8.72	8.28	6.82	6.12	8.12	
50%	-50.00	-25.00	0.00	25.00	50.00	

(SD)	0.00	0.00	0.00	0.00	0.00	
51-99%	-73.46	-49.21	-25.50	1.18	28.55	0.000
(SD)	11.01	12.17	11.99	12.95	13.44	
100%	-100.00	-75.00	-50.00	-25.00	0.00	
(SD)	0.00	0.00	0.00	0.00	0.00	
Observations	31.00	28.00	30.00	32.00	28.00	
Panel D: Conformity - 0-24%	2.40	1.84	0.36	0.33	0.27	0.324
(SD)	3.71	0.51	0.44	0.23	0.23	
25-49%	0.87	1.63	1.31	0.83	0.46	0.021
(SD)	0.13	1.00	0.95	0.24	0.26	
50%	0.55	0.81		0.97	0.75	0.135
(SD)	0.34	0.32		0.18	0.29	
51-99%	0.62	0.74	1.42	1.31	0.62	0.248
(SD)	0.24	0.36	1.28	1.56	0.45	
100%	0.60	0.84	0.87	1.39		0.024
(SD)	0.18	0.18	0.35	0.88		
Observations	31.00	27.00	28.00	32.00	25.00	

Notes: Scenario-level observations (5 peer scenarios per respondent).
Classifier: Unconditional payment category: respondent's Round 1 ISF payment as a percentage of billed ISF, grouped into five bins: 0-24%, 25-49%, 50%, 51-99%, 100%.
Standard deviations below means. P-value from F-test of outcome differences across peer levels within each subgroup.
Effective payment: revised amount if revised, otherwise unconditional.
Payoff inequality: respondent's payoff minus peer's payoff.
Peer gap: peer payment % minus respondent's unconditional payment %.
Conformity: |revised% - unconditional%| / |peer% - unconditional%|, defined for revisers where peer != unconditional.

Table B2: Scenario-Level Descriptives by Injunctive Norm

	Peer 0%	Peer 25%	Peer 50%	Peer 75%	Peer 100%	P-value
Panel A:	40.00	40.15	41.79	43.74	45.84	0.96

Eff. payment - Low						4
(SD)	29.36	29.12	27.85	26.77	28.00	
High	73.32	75.31	76.35	76.30	79.61	0.801
(SD)	32.98	30.59	29.52	30.04	28.36	
Observations	252.00	243.00	242.00	242.00	243.00	
Panel B: Payoff ineq. - Low	-4,908,552.63	-1,621,052.63	1,666,447.37	4,953,947.37	8,241,447.37	0.000
(SD)	6,558,815.17	2,408,102.83	3,621,473.51	8,060,173.06	12,702,476.83	
High	-25,023,083.20	-16,023,090.17	-6,226,996.44	3,569,097.28	13,365,191.00	0.000
(SD)	40,154,942.87	30,594,901.40	25,729,208.65	29,013,852.07	38,412,007.44	
Observations	252.00	243.00	242.00	242.00	243.00	
Panel C: Peer gap - Low	-42.60	-22.03	-3.33	-25.00	0.00	0.655
(SD)	37.15	36.26	41.63			
High	-57.76	-35.10	-8.72	15.47	48.09	0.000
(SD)	16.13	15.87	21.77	16.90	16.84	
Observations	31.00	28.00	30.00	32.00	28.00	
Panel D: Conformity - Low	0.75	1.79	1.31	2.40		0.078
(SD)	0.26	0.49	1.12			
High	0.67	0.74	1.46	1.56	0.56	0.184
(SD)	0.33	0.37	1.05	1.73	0.35	
Observations	31.00	27.00	28.00	32.00	25.00	

Notes: Scenario-level observations (5 peer scenarios per respondent).
Classifier: **Injunctive norm (binary):** respondent's perception of

the socially expected ISF payment level. Low = below 50%; High = above 50%.
Standard deviations below means. P-value from F-test of outcome differences across peer levels within each subgroup.
Effective payment: revised amount if revised, otherwise unconditional.
Payoff inequality: respondent's payoff minus peer's payoff.
Peer gap: peer payment % minus respondent's unconditional payment %.
Conformity: |revised% - unconditional%| / |peer% - unconditional%|, defined for revisers where peer != unconditional.

Table B3: Scenario-Level Descriptives by Descriptive Norm

	Peer 0%	Peer 25%	Peer 50%	Peer 75%	Peer 100%	P-value
Panel A: Eff. payment - Low	67.35	68.91	69.02	71.44	73.70	0.418
(SD)	33.40	32.03	31.21	30.10	30.32	
High	65.33	67.77	70.48	71.05	74.45	0.377
(SD)	33.64	32.86	31.30	31.30	30.69	
Observations	252.00	243.00	242.00	242.00	243.00	
Panel B: Payoff ineq. - Low	-20,795,882.50	-13,907,485.21	-6,572,086.27	962,187.01	8,458,384.31	0.000
(SD)	48,406,006.13	36,721,204.56	25,961,354.10	19,085,235.26	21,010,415.51	
High	-16,804,551.52	-9,790,056.73	-2,185,744.31	5,397,301.18	12,702,291.69	0.000
(SD)	30,888,155.84	20,220,650.73	17,076,921.79	25,452,944.46	37,924,562.69	
Observations	252.00	243.00	242.00	242.00	243.00	
Panel C:	-52.77	-32.12	-13.37	15.60	45.28	0.00

Peer gap - Low						0
(SD)	33.09	29.08	31.86	31.15	27.51	
High	-75.92	-48.00	-7.19	19.19	55.58	0.000
(SD)	28.74	31.47	33.03	32.92	28.91	
Observations	31.00	28.00	30.00	32.00	28.00	
Panel D: Conformity - Low	1.12	1.16	1.17	1.02	0.52	0.440
(SD)	1.93	0.75	1.07	1.00	0.35	
High	0.64	0.85	0.86	1.03	0.54	0.130
(SD)	0.24	0.23	0.34	0.74	0.37	
Observations	31.00	27.00	28.00	32.00	25.00	

Notes: Scenario-level observations (5 peer scenarios per respondent).
Classifier: Descriptive norm (binary): respondent's belief about the share of IO members who actually pay ISF. Low = below 50%; High = above 50%.
Standard deviations below means. P-value from F-test of outcome differences across peer levels within each subgroup.
Effective payment: revised amount if revised, otherwise unconditional.
Payoff inequality: respondent's payoff minus peer's payoff.
Peer gap: peer payment % minus respondent's unconditional payment %.
Conformity: |revised% - unconditional%| / |peer% - unconditional%|, defined for revisers where peer != unconditional.

Table B4: Scenario-Level Descriptives by ISF Rate

	Peer 0%	Peer 25%	Peer 50%	Peer 75%	Peer 100%	P-value
Panel A: Eff. payment - Low	71.38	71.30	73.46	74.61	76.87	0.645
(SD)	32.70	32.26	30.48	29.48	29.10	
High	62.86	66.29	66.46	68.71	71.67	0.222
(SD)	33.64	32.23	31.50	31.10	31.32	
Observations	252.00	243.00	242.00	242.00	243.00	
Panel B: Payoff ineq. - Low	-20,276,238.74	-13,929,147.20	-6,982,943.93	-24,115.57	6,859,375.00	0.000
(SD)	55,166,136.73	41,445,861.90	28,204,243.47	19,607,308.55	21,670,999.65	
High	-18,600,691.06	-11,226,223.90	-3,354,706.99	4,600,702.60	12,566,863.35	0.000
(SD)	29,925,324.14	21,372,277.05	18,138,248.23	23,022,264.20	32,772,416.64	
Observations	252.00	243.00	242.00	242.00	243.00	
Panel C: Peer gap - Low	-62.33	-36.02	-13.18	3.57	39.83	0.000
(SD)	33.82	26.27	28.89	22.17	18.71	
High	-61.35	-36.18	-11.10	23.43	53.28	0.000
(SD)	33.45	34.78	33.52	33.42	30.88	
Observations	31.00	28.00	30.00	32.00	28.00	
Panel D: Conformity - Low	0.67	1.00	0.90	0.93	0.47	0.047
(SD)	0.27	0.46	0.36	0.60	0.31	
High	1.10	1.20	1.14	1.07	0.56	0.539

(SD)	1.93	0.90	1.05	1.07	0.38
	31.00	27.00	28.00	32.00	25.00
Observations					

Notes: Scenario-level observations (5 peer scenarios per respondent).
Classifier: ISF rate (binary): whether the IO's billed ISF rate per hectare is above or below the latest NIRC rates. Low = below NIRC rate ; High = current rate.
Standard deviations below means. P-value from F-test of outcome differences across peer levels within each subgroup.
Effective payment: revised amount if revised, otherwise unconditional.
Payoff inequality: respondent's payoff minus peer's payoff.
Peer gap: peer payment % minus respondent's unconditional payment %.
Conformity: |revised% - unconditional%| / |peer% - unconditional%|, defined for revisers where peer != unconditional.

Table B5: Scenario-Level Descriptives by Irrigated Area

	Peer 0%	Peer 25%	Peer 50%	Peer 75%	Peer 100%	P-value
Panel A: Eff. payment - Q1	72.60	74.96	76.23	78.16	82.37	0.463
(SD)	33.80	32.34	30.11	29.26	28.33	
Q2	64.42	67.19	69.67	70.39	73.81	0.539
(SD)	33.83	32.21	30.30	30.04	29.43	
Q3	60.99	63.20	63.61	66.66	66.76	0.83

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(SD)	33.54	32.28	31.50	30.94	32.00	
Q4	68.23	68.41	68.50	69.90	72.58	0.935
(SD)	32.15	31.94	32.23	31.22	30.43	
	252.00	243.00	242.00	242.00	243.00	
Observations						
Panel B: Payoff ineq. - Q1	-2,514,038.46	-1,767,943.55	-1,009,072.58	-231,762.30	524,404.76	0.000
(SD)	1,548,423.32	1,304,366.13	1,087,668.80	974,333.57	971,313.41	
Q2	-5,272,656.25	-3,413,020.83	-1,494,279.66	552,604.17	2,486,864.41	0.000
(SD)	3,113,354.39	2,805,053.77	2,654,042.26	2,650,783.71	2,723,974.05	
Q3	-10,127,801.61	-6,009,461.67	-1,824,361.67	2,360,738.33	6,545,838.33	0.000
(SD)	5,691,341.53	5,485,141.06	5,584,019.60	6,042,616.06	6,788,414.70	
Q4	-61,386,454.75	-38,397,110.66	-15,407,766.30	7,581,577.93	30,570,922.16	0.000
(SD)	72,272,642.88	55,723,995.46	44,337,104.52	42,487,413.99	51,218,826.83	
	252.00	243.00	242.00	242.00	243.00	
Observations						
Panel C: Peer gap - Q1	-91.29	-64.11	-40.32	-16.95	10.76	0.000
(SD)	12.42	13.09	12.77	12.61	10.72	
Q2	-46.46	-14.94	9.54	25.75	53.61	0.000
(SD)	20.78	20.45	14.72	15.37	16.60	
Q3	-43.17	-25.36	-8.81	28.09	62.90	0.000
(SD)	35.70	33.11	37.58	31.66	17.69	
Q4	-57.42	-40.14	0.89	28.86	55.71	0.000
(SD)	35.31	26.12	32.66	31.11	31.34	
	31.00	28.00	30.00	32.00	28.00	
Observatio						

ns						
Panel D: Conformity - Q1	0.65	0.83	0.98	1.61	0.67	0.090
(SD)	0.22	0.30	0.30	1.48	0.58	
Q2	0.68	1.29	1.09	0.82	0.73	0.100
(SD)	0.33	0.57	0.72	0.29	0.27	
Q3	1.70	1.46	1.27	0.71	0.43	0.461
(SD)	2.74	1.03	1.50	0.34	0.30	
Q4	0.47	0.70	1.00	0.96	0.39	0.346
(SD)	0.33	0.34	1.07	0.85	0.33	
Observations	31.00	27.00	28.00	32.00	25.00	

Notes: Scenario-level observations (5 peer scenarios per respondent).
Classifier: Irrigated area quartile total irrigated area of the IO, split into four quartiles. Q1 = smallest irrigated area; Q4 = largest.
Standard deviations below means. P-value from F-test of outcome differences across peer levels within each subgroup.
Effective payment: revised amount if revised, otherwise unconditional.
Payoff inequality: respondent's payoff minus peer's payoff.
Peer gap: peer payment % minus respondent's unconditional payment %.
Conformity: |revised% - unconditional%| / |peer% - unconditional%|, defined for revisers where peer != unconditional.

Table B6: Scenario-Level Descriptives by ISF Compliance (2024)

	Peer 0%	Peer 25%	Peer 50%	Peer 75%	Peer 100%	P-value
Panel A: Eff. payment - Not Paid	72.34	73.15	73.93	77.27	79.18	0.352
(SD)	31.89	30.75	29.36	27.28	27.64	
Paid	61.80	64.45	65.78	66.15	69.54	0.416
(SD)	34.05	33.12	32.31	32.21	32.01	
Observations	252.00	243.00	242.00	242.00	243.00	
Panel B: Payoff	-21,288,466.	-14,276,152.	-7,086,934.8	219,703.57	7,526,341.96	0.000

ineq. - Not Paid	96	28	2			
(SD)	54,638,336.24	41,144,776.90	29,417,264.81	23,142,153.72	26,779,158.50	
Paid	-17,702,089.34	-10,799,846.09	-3,125,567.26	4,604,096.18	12,170,906.50	0.000
(SD)	29,602,435.93	20,431,393.75	15,796,975.27	20,191,088.81	29,771,203.33	
Observations	252.00	243.00	242.00	242.00	243.00	
Panel C: Peer gap - Not Paid	-58.97	-39.19	-18.31	8.97	46.89	0.000
(SD)	35.87	31.69	31.76	28.74	23.85	
Paid	-64.68	-32.99	-4.19	25.26	50.51	0.000
(SD)	30.68	28.90	31.09	32.48	31.33	
Observations	31.00	28.00	30.00	32.00	28.00	
Panel D: Conformity - Not Paid	1.23	1.23	1.05	0.93	0.60	0.655
(SD)	2.09	0.75	1.09	0.48	0.32	
Paid	0.61	0.94	1.11	1.13	0.47	0.071
(SD)	0.27	0.59	0.76	1.27	0.38	
Observations	31.00	27.00	28.00	32.00	25.00	

Notes: Scenario-level observations (5 peer scenarios per respondent).
Classifier: Real-world ISF compliance (binary): whether the respondent's IO actually paid its irrigation service fee in the 2024 season.
Not Paid = IO did not pay ISF; Paid = IO paid ISF.
Standard deviations below means. P-value from F-test of outcome differences across peer levels within each subgroup.
Effective payment: revised amount if revised, otherwise unconditional.
Payoff inequality: respondent's payoff minus peer's payoff.
Peer gap: peer payment % minus respondent's unconditional payment %.
Conformity: |revised% - unconditional%| / |peer% - unconditional%|, defined for revisers where peer != unconditional.