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Firms' contribution to flood risk reduction – scenario-based experiments from Jakarta and Semarang, Indonesia

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Abstract

The importance of private sector engagement on risk reduction is increasingly mentioned over the last years. The Sendai Framework for Disaster Risk Reduction 2015-2030 stresses that the private sector should be a crucial partner in achieving disaster resilience. However, the contribution by the private sector is still rare and mostly undertaken by large multinational firms with just a few positive impacts on the local level.

Particularly manufacturing firms are heavily exposed to floods in Indonesia; Jakarta and Semarang are prominent examples. Broader flood risk reduction measures are still insufficiently developed. Therefore, it is argued that firms can reduce the flood risk through collective adaptation measures. We understand collective adaptation as collaborative activities to reduce risks that firms are either initiating or participating together with other firms, the community, NGOs and authorities.

Our own research has revealed that particularly small and medium-sized enterprises (SMEs) rarely engage in collective flood adaptation. Based on our findings, this paper examines which circumstances determine the willingness of SMEs to contribute to flood risk reduction. Instruments in order to increase the willingness to collective adaptation are also discussed.

Scenario-based experiments with 120 SMEs have been conducted in Jakarta and Semarang. These scenarios contain different risk reduction measures (polder system, river expansion and sensitization program), each with different actors' constellation of contribution. Comparative logistic regressions have been applied to determine context-specific factors, e.g. risk behavior, firm-specific characteristics or level of flood-proneness that influence the willingness to contribute to flood risk reduction.

Overall, the paper provides deeper insights in understanding firms' engagement in flood risk reduction and gives answers of how firms can be motivated to become an active player on building resilience.

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1. Introduction

Over the last years the importance of private sector engagement on risk reduction has increasingly been mentioned. For instance, the Sendai Framework for Disaster Risk Reduction 2015-2030 [1] stresses that the private sector should be an important player in order to achieve risk reduction. However, engagement by the private sector is still rare and mostly dominated by large multinational firms that have just sparse positive impacts on disaster risk reduction for local communities and economies [2].

The role of small and medium-sized enterprises (SMEs) related to private sector engagement is often neglected by the scientific discourse and by policy makers. However, SMEs are often the main driver of local socioeconomic welfare in many hazard-prone countries in the Global South, such as Vietnam, Indonesia or Ghana [2, 3]. Therefore, we argue that SMEs might play a crucial role in providing flood risk reduction measures (FRRM). Especially when political authorities are overwhelmed by providing sufficient flood risk reduction. However, the question arises: Why should SMEs engage in flood risk reduction and take over the role of political authorities? We argue that SMEs might have a pure interest on providing FRRM that reduce their own exposure and those of the community. We define these activities as collective adaptation that are collaborative activities for risk reduction that firms are either initiating or participating together with other firms, the community, NGOs and authorities.

In order to understand the collective adaptation of SMEs, it should be considered that risk reduction measures like a dyke system are public goods [4]. Public goods can be consumed by everyone without reducing the benefit of others, and no one can be excluded. That means that it is not economically rational of a private firm to fund on their own as everyone can benefit from the funding. In particular behavioral economic approaches have enriched the scientific insights in the contribution of public goods by using experimental methods to investigate the motivation and circumstances of the willingness of actors to cooperate or not. These insights, on the one hand, are sparsely acknowledged within the studies about adaptation to natural hazards. On the other hand, field experiments about public goods games are still rare, and researchers doubt whether laboratory experiments can elucidate the behavior of actors [5]. To our knowledge there are no field experiments that use firms' decision-makers as participants in a public goods experiment.

Therefore, this paper will make use of methodological approaches of behavioral economics and will examine what contextual factors determine the willingness to contribute to FRRM of firms' decision-makers within a field experiment. We will exemplify it on SMEs in the Indonesian flood-prone cities Jakarta and Semarang. Accordingly, our enquiry is guided by the research question: What impact do firms' characteristics, the institutional environment and the flood exposure have on the willingness to contribute to collective flood risk reduction by SMEs? In order to answer the research question, we apply scenario-based experiments.

The paper continues as follows: Chapter two will outline literature about private sector engagement and the empirical evidence of public good games. The third and fourth chapter present the methodological approach and research design. In the fifth chapter the results of the empirical investigation are presented. Chapter six discusses the results. The paper concludes with the seventh chapter.

2. Private sector engagement – firms as conditional cooperators?

Discourses on private sector engagement focus primarily on how firms see investments on risk reduction as a business opportunity [e.g. 6] or how firms show philanthropic response to natural hazards [e.g. 7, 8]. Besides this engagement, more contribution by the private sector on the community level can be beneficial in order to support political authorities with the challenging task of providing sufficient risk reduction. Recently, literature mentions this more and more [e.g. 2, 6, 9]. However, risk reduction measures are typically a public good. The provision of such measures does not give immediately a financial payoff, and there is the danger that others can benefit from those. Thus, normally public goods are provided by political authorities and funded by tax money. However, this optimal situation does not everywhere exist, particularly in the Global South. This dilemma makes it difficult to encourage firms to provide public goods.

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