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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.

How to solve this social dilemma is of great interest for behavioral economic studies. The dilemma lies in the seeking of actors to maximize their own profit and thus try to free-ride by others' efforts. In contrast to the standard economics assumption that actors are selfish, rational behavioral economic approaches have shown that actors are willing to cooperate much more than expected. Several studies reveal that reciprocity determines whether actors will cooperate, which means that the majority of people are conditional cooperators [10, 11]. They prefer to cooperate under the condition that other actors will also cooperate. Research by Ledyard [12] discovered that the share of contribution lies between 40 and 60 %. The empirical evidence is broad and revealed that cooperative behavior is caused e.g. by communication, trust, punishment of free-riders, uncertainty, and altruistic behavior [for an overview 12, 13].

3. Methodological approach

Within the field of adaptation to natural hazards, public goods games focus primarily on the willingness of households to pay for flood insurance [e.g. 14, 15] or flood risk reduction [e.g. 16, 17]. Overall, field experiments in the Global South can typically be found on studies about common pool resources [e.g. 18, 19]. As there are, to best of our knowledge, no field experiments that use firms' decision-makers as participants in a public goods experiment, we adopted the methodological approaches of public goods games and conducted the field experiments based on the research design of vignette studies.

A specific approach of public goods experiments is the provision point mechanism (PPM). This approach is common for discrete public goods, such as FRRM, and to examine the individual contribution. Discrete public goods are those which are just provided if a certain required threshold of contribution is reached. Accordingly, in a PPM, actors are asked to contribute to a public good that cannot be provided solely by one actor alone, thus joint contribution is required. The threshold is called the provision point. If the provision point is not reached, the contribution will be refunded to the actors [20, 21].

Vignette studies investigate the attitude or judgment of respondents. It is a hybrid methodological approach that combines classical experiments with the element of a survey. As a quasi-experiment, the method enables the collection of data from many respondents in a controlled setting [22, 23, 24]. A multiple set of different vignettes is presented to the respondents in order to examine their intended behavior to the scenario. The strength of vignette studies is that it enables researchers to identify simultaneously the importance of the explanatory factors (i.e. scenarios) and the contextual factors (i.e. respondent characteristics) that might determine the individual decision-making. That results in more realistic scenarios [22, 23].

The core of the vignette study is the experiment. Vignettes are carefully conceptualized descriptions of a scenario that is presented and judged by the respondents [22, 24]. Crucial is the construction of the scenarios. The scenarios should represent realistic, but hypothetical situations. The systematical construction of the scenarios is based on postulated factors that might influence the judgment [25]. Usually, practice-oriented knowledge or former research serve as the foundation of the scenarios [25, 26]. Furthermore, the wording of the vignettes has to be conceptualized carefully and cultural factors like language or tradition should be taken into account [26]. The additional survey is used to collect respondent-related information as dependent variables [22].

4. Research design

Our analysis applies the methods of vignette studies, but the methodological rationale is based on the PPM. This combination allows us to develop realistic scenarios in order to examine the SME's contribution on a discrete public good. These public goods are in our case FRRM that require a high investment, thus can only be provided if the participants cooperate. Related to Rungtusunatham et al. [27], we call our approach "scenario-based experiments".

In total 120 SMEs, 60 each in Jakarta and Semarang, participated in the study. All of them are manufacturing firms. The SMEs were selected randomly if they have no more than 250 employees and their business was disrupted by flood within the last five years. The experiments were pretested in Indonesia and conducted jointly with Indonesian colleagues in order to prevent cultural misunderstandings.

In order to reduce the specific local conditions of the participants, a specific familiar set-up of the situation was designed and each participant was given the same role within the game. The set-up is based on field observations of

the architecture and local conditions of flood-prone industrial locations in the research areas. Before starting the experiment, the set-up was explained to every participant as well as illustrated by images. Possible lack of understanding was limited by responding to the question of the participants and by two test scenarios. The participants were given the role of the decision-maker of a garment industry with 50 employees. The hypothetical firm is located in a mixed industrial residential area. Within this neighborhood there are four other firms. The area is affected by seasonal floods for five years, and the production has to be stopped for four weeks. In the future, the flood risk will increase and until now there is no implementation of FRRM by political authorities. The participants were informed that own efforts on flood risk reduction will have negative side effects for the other firms and the residents (e.g. more severe inundation). Therefore, the only effective solution to reduce the flood risk for the entire neighborhood is the implementation of large FRRM.

The selection and description of the scenarios are based on the overview of FRRM by Geaves et al. [4] and common, respectively realistic local measures, derived by former in-depth interviews with firms. Three FRRM were selected. The first one contains the construction of a polder system. The second one represents a river expansion that takes also into account that the firms have to give away 10 % of their land to widen the drainage canals. The last one focuses on a soft measure. The respondents are asked to fund an education program that should sensitize the residents in how to prevent floods. Also five different dimensions were constructed in order to examine whether the contribution of others, certainty about the contribution of others or political pressure determine the willingness. In the first dimension, the community will join the contribution. The second one describes that all firms will contribute the same amount. The third dimension conceptualizes that nobody else will contribute. At the first three dimensions, the participants know to what degree the other actors will contribute. In the fourth dimension, the other firms will contribute less than the necessary threshold. The last one conceptualizes that the respondent is forced by political authorities to provide the measures, otherwise he/she has to pay a fine. For all three measures, the five dimensions were tested. That means fifteen scenarios were presented to the respondents.

For each scenario the participants were asked how much of their allocated budget they were willing to contribute. The participants were always informed about the entire costs, their budget, the total required investment and the expected benefits for their own firm. The participants were informed that the part of their budget they do not want to invest can be used for firm-specific investments. If the necessary investment (i.e. threshold) will not be reached, their contribution will be refunded. The given contribution was written down. Then the answers were transformed in our dependent variable "contribution threshold". It is a binary variable that means if the threshold was reached it was coded as 1 and 0 if not. Participants who contribute at least as much as the threshold will be called cooperator; participants whose contribution did not meet the threshold are called non-cooperator. Additionally the participants were asked to fill out a brief survey that consists of questions about their firm, engagement on flood adaptation, cooperation and their assessment of the institutional environment. We selected control variables from the survey, the scenarios and the Village Potential Survey 2014 [28]. The control variables are framed in four groups (cf. Table 1).

We deployed a robust logistic regression analysis. As each participant made their decision on different kinds of scenarios, we treat each decision as a unique observation. Consequently, the analysis consists of 1,800 observations (15 scenarios for 120 participants).

Table 1: Overview of control variables.

	Variable	Description	Range		Expected Impact
			Min	Max	
Scenario [a]	Necessary contribution	Percentage of necessary contribution from budget reaching threshold	45	100	Negative
	Certainty (1 = yes)	Whether the participants were informed how much the others will contribute.	0	1	Positive
	Community support	Percentage of contribution from residents	0	26.67	Positive
	Political pressure	Percentage of needed contribution from budget reaching threshold	0	16.67	Positive
Firm characteristic [b]	Risk-seeking behavior (1 = yes)	If participants will change their business model to export during tough market conditions	0	1	Positive

	Size of business	Number of employees	1	250	Positive
	Growing business (1 = yes)	Development of turnover in the last 5 years	0	1	Positive
	Own adaptation (1 = yes)	Has firm undertaken preparations for floods within the last 10 years?	0	1	Positive
	Planned relocation (1 = yes)	Is firm planning to relocate?	0	1	Negative
	CSR ecological (1 = yes)	Is firm actively supporting the local community with ecological programs (e.g. waste minimization, renaturation)?	0	1	Positive
	CSR social (1 = yes)	Is firm actively supporting the local community with social programs (e.g. poverty alleviation, education)?	0	1	Positive
	Cooperation (1 = yes)	Does firm cooperate with other firms?	0	1	Positive
Institutional environment [b]	Support during floods (6 = very good – 1 = very poor)	Rating of the support of authorities during flood incidents	1	6	Negative
	Getting permission (6 = very good – 1 = very poor)	Rating of the support of authorities on getting permission	1	6	Positive
Physical exposure [c]	Flood-prone district	Amount of flood events in sub-district 2011-2013	0	24	Positive

a) Derived from experiments; b) Derived from survey; c) Derived from Village Potential Survey 2014 [28]   Source: Authors

5. Results

5.1. Descriptive results

Overall, 43.3 % of all respondents are willing to contribute. Hereby, the willingness is higher in Semarang (49,8 %) than in Jakarta (36.9 %). Table 2 provides the descriptive results regarding the control variables. The scenario control variables show that there is a positive relationship between community support and the willingness to contribute. It can also be shown that a lower amount of budget has a positive relationship to the willingness to contribute on all models. Surprisingly, certainty about contribution of others has a negative relationship on the willingness to contribute. That means that a high certainty is not necessary for the participants in order to contribute. Political pressure causes a positive relationship for the entire model and for Jakarta, but not for Semarang. It means less political pressure has a positive influence on the willingness to contribute. Related to the firms characteristic, it can be shown that risk-seeking behavior has a positive relationship to the willingness to contribute. Furthermore, the results reveal that smaller firms are relatively more willing to contribute. This relationship is especially true for Semarang. Being a growing business has apparently not a big impact on the willingness to contribute, but there is a slight positive relationship. Own adaptation leads to a low negative relationship that is higher in Jakarta than in Semarang. Engagement on CSR, both ecological and social activities, have a negative relationship. An exception is 'CSR social' that has a nearly neutral relationship in Jakarta. Cooperation shows a negative relationship whether the participants willingness to contribute. The institutional environment control variables have a positive effect on the willingness to contribute, but the difference between contribution and no contribution is not very large. Governmental support during floods determines particularly the willingness to contribute in Jakarta, whereas in Semarang it is quite equal. The control variable of getting permission does not show a distinction. It seems that there is a neutral relationship. The same results can be seen for the control variable 'planned relocation'. Also, the descriptive results show that the amount of flood events influence positively that the participants are willing to contribute.

These results give a first insight into which contextual factors determine the willingness to contribute. In the next section, the analysis tests which impacts the circumstances have in order to increase the likelihood of willingness to contribute.

Table 2: Overview of control variables.

	Variable	Modell All		Modell Jakarta		Modell Semarang	
		1= Yes Mean (SD) (n=780)	0 = No Mean (SD) (n=1020)	1= Yes Mean (SD) (n=332)	0 = No Mean (SD) (n=568)	1= Yes Mean (SD) (n=448)	0 = No Mean (SD) (n=452)
Scenario	Necessary contribution	66.92 (20.51)	78.35 (22.26)	64.82 (19.55)	78.42 (22.22)	68.48 (21.07)	78.28 (22.34)

	Certainty	.54 (.49)	.65 (.48)	.52 (.50)	.64 (.48)	.55 (.49)	.65 (.48)
	Community support	6.51 (10.66)	3.45 (8.55)	7.23 (11.06)	3.35 (8.40)	5.97 (10.34)	3.59 (8.75)
	Political pressure	2.34 (5.02)	2.61 (5.26)	2.52 (5.15)	2.47 (5.17)	2.20 (4.93)	2.78 (5.37)
Firm characteristic	Risk-seeking behavior	.78 (.41)	.65 (.48)	.77 (.42)	.60 (.49)	.78 (.41)	.71 (.45)
	Size of business	31.26 (55.79)	42.03 (65.77)	30.01 (60.56)	36.75 (59.14)	32.18 (52.02)	48.68 (72.77)
	Growing business	.23 (.42)	.19 (.39)	.24 (.43)	.17 (.38)	.22 (.42)	.21 (.41)
	Own adaptation	.79 (.41)	.82 (.38)	.70 (.46)	.78 (.42)	.86 (.35)	.87 (.33)
	Planned relocation	.20 (.40)	.27 (.45)	.26 (.44)	.35 (.48)	.16 (.36)	.17 (.38)
	CSR ecological	.57 (.49)	.62 (.48)	.52 (.50)	.57 (.49)	.61 (.49)	.69 (.46)
	CSR social	.49 (.50)	.53 (.49)	.47 (.50)	.46 (.50)	.51 (.50)	.62 (.49)
	Cooperation	.49 (.50)	.57 (.49)	.59 (.49)	.63 (.48)	.43 (.49)	.50 (.50)
Institutional environment	Support during floods	4.24 (1.37)	4.07 (1.44)	4.60 (1.45)	4.20 (1.43)	3.96 (1.25)	3.90 (1.45)
	Getting permission	4.79 (1.00)	4.75 (1.20)	4.87 (1.22)	4.73 (1.39)	4.74 (.79)	4.76 (.89)
Physical exposure	Flood-prone district	6.13 (5.42)	5.09 (3.86)	6.85 (3.34)	5.74 (3.39)	5.59 (6.49)	4.28 (4.23)

Source: Author's calculation

5.2. Analytical results

Overall, the logistic regressions reveal that in all of the grouped control variables there are significant impacts on the likelihood of the willingness to contribute (cf. Table 3). Regarding the scenarios it can be shown that the contribution of the community, political pressure, and the necessary contribution will decrease significantly the likelihood that SMEs will contribute. That is true for all three models. Solely the negative impact of the community support is not significant for Jakarta. The likelihood of willingness to contribute can be increased by the certainty of knowing how much the other actors will contribute. The result is significant for the entire model and for Semarang.

Firm-specific determinants reveal that particularly a risk-seeking behavior and a competitive condition increase significantly the likelihood that SMEs are willing to contribute. All models show this positive impact. The business size decreases slightly the likelihood. This result is significant for the entire model and for Semarang. CSR-activities that focus on ecological topics decrease the likelihood. However, the result is solely significant for the model Semarang. CSR activities with social purpose increase the likelihood significantly in the entire model and in Jakarta. Furthermore, the analysis shows that own adaptation efforts decrease significantly the likelihood that SMEs are willing also to contribute to collective adaptation. Not surprisingly, relocation plans decrease significantly the likelihood of the willingness to contribute. Cooperation with other firms also decreases the likelihood of the willingness to contribute. This is significant for all models. Control variables regarding business-friendly institutional environment show that SMEs will more likely significantly contribute if they appreciate the good support by political authorities during flood events. The better the SMEs evaluate the permission procedure, the more unlikely they are willing to contribute. Both results are significant for all models. The more the SMEs are exposed to floods, the more likely they are willing to contribute.

Table 3: Determinants on likelihood willingness to contribute.

	Variable	Model all	Model Jakarta	Model Semarang
Scenario	Necessary contribution	-.075***	-.059**	-.098***
	Certainty	1.65**	.838	2.576**
	Community support	-.107**	-.055	-.168***
	Political pressure	-.059***	-0.43**	-0.79***
Firm characteristic	Risk-seeking behavior	.860***	.848***	1.047***

	Size of business	-.005***	-.002	-.007***
	Growing business	.620***	.394*	.888***
	Own adaptation	-.522***	-.648***	-.904***
	Planned relocation	-.423***	-.231	-.380*
	CSR ecological	-.132	-.034	-.286*
	CSR social	.248**	.443***	.114
	Cooperation	-.457***	-.448**	-.337**
Institutional environment	Support during floods	.109***	.271***	.112**
	Getting permission	-.177***	-.138**	-.422***
Physical exposure	Flood-prone district	.044***	.076*	.054***
	Constant	5.186***	2.691	8.396***
	Model fit			
	Prob > chi2 (wald chi2 value)	242.77***	149.58***	108.06***
	Pseudo-R2	12.13 %	16.35 %	11.18 %
	N	1800	900	900

Significance level: * = 10 %; ** = 5 %; *** = 1 %   Source: Author's calculation

6. Discussion

Overall, our results reveal diverse conclusions about what contextual factors determine the willingness to contribute. These results also give advice to policy makers. SMEs are willing to contribute if they are certain that others are also contributing. That proves that the SMEs are conditional cooperators. However, the results are not clear in showing whether the SMEs have a prosocial behavior. On the one hand, the regression analysis regarding 'community support' indicates that SMEs are more likely free-riders. It can be shown that SMEs rely more on individual adaptation and thus, if they do so, it is more unlikely that they are willing to contribute to a collective adaptation. On the other hand, SMEs that engage on CSR with a social purpose are also those who are more likely willing to contribute. One explanation why the SMEs are not showing a distinctive social behavior can be drawn from the control variable 'support during flood'. SMEs are more likely willing to contribute if they receive governmental support on adaptation. Particularly relevant in order to design private-sector engagement, the results show that SMEs are more unlikely willing to contribute if the amount is too high and they are forced to contribute. Positive impact on willingness to contribute is determined if the SMEs have a good competitive situation, are being largely exposed to floods and the decision-maker possesses a risk-seeking behavior.

In sum, SMEs are willing to contribute, but it depends largely on their own situation (e.g. competitive situation), but also on the wider context such as behavior of others, amount of necessary contribution and flood exposure. Furthermore, our analysis reveals that SMEs are willing to contribute under the condition that they receive support by other firms and the political authorities. It is important to note that SMEs prefer individual adaptation to collective adaptation.

7. Conclusion

This paper focused on the topic of private sector engagement on flood risk reduction. We examined what contextual factors determine the willingness of SMEs in Jakarta and Semarang to contribute. The enquiry was based methodologically by approaches to the behavioral economics: public goods games and vignette studies. Through a scenario-based field experiment with 120 decision-makers of SMEs, we examined their willingness to contribute to FRRM. The enquiry revealed that SMEs are conditional cooperators, but show a limited prosocial behavior. A more important impact on the willingness to contribute lies on the firm-specific conditions and if they receive support by political authorities. However, individual rather than collective adaptation is still more favored by the SMEs.

Hence, private-sector engagement can be a promising tool for flood risk reduction, but there are apparently obstacles that limit the willingness of SMEs to contribute. Therefore, there is still demand for further empirical research in order to examine the circumstances that determine whether SMEs engage in flood risk reduction or not. This paper presented a methodological approach that can be used in order to make this endeavor.

References

[1] UNISDR, Sendai Framework for Disaster Risk Reduction 2015-2030, http://www.unisdr.org/we/inform/publications/43291 (accessed 10.01.2017).

[2] W.P. Pauw, Not a panacea. Private-sector engagement in adaptation and adaptation finance in developing countries. Clim. Policy 15 (2015) 583–603.

[3] N. Burger, C. Chazali, A. Gaduh, A.D. Rothenberg, I. Tjandraningsih, S. Weilant, Reforming Policies for Small and Medium-Sized Enterprises in Indonesia. Santa Monica, CA: RAND Corporation, 2015. https://www.rand.org/pubs/research_reports/RR1096.html (accessed 28.04.2017).

[4] L.H. Geaves, E.C. Penning-Rowsell, Flood Risk Management as a public or a private good, and the implications for stakeholder engagement, Environ. Sci. Policy 55 (2016) 281–291.

[5] G.W. Harrison, J.A. List, Field Experiments, J. Econ. Lit. 42 (2004) 1009–1055.

[6] T. Izumi, R. Shaw, Overview and Introduction of the Private Sector's Role in Disaster Management, in: T. Izumi, R. Shaw (Eds.), Disaster Management and Private Sectors. Challenges and Potentials, Springer, Tokyo, 2015, pp. 1–10.

[7] J.P. Sarmiento, G. Hoberman, M. Ilcheva, A.Asgary, A.M. Majano, S. Poggione, L.R. Duran, Private sector and disaster risk reduction: The Cases of Bogota, Miami, Kingston, San Jose, Santiago, and Vancouver, Int. J. Disast. Risk. Re. 14 (2015) 225–237.

[8] A. Tilcsik, C. Marquis, Punctuated generosity: How mega-events and natural disasters affect corporate philanthropy in U.S. communities, Admin. Sci. Quart., 58 (2013) 111–148.

[9] B. McKnight, M.K. Linnenluecke, How Firm Responses to Natural Disasters Strengthen Community Resilience. A Stakeholder-Based Perspective, Organ. Environ. 29 (2016) 290–307.

[10] U. Fischbacher, S. Gächter, E. Fehr, Are people conditionally cooperative? Evidence from a public goods experiment, Econ. Lett. 71 (2001) 397–404.

[11] C. Keser, F. van Winden, Conditional Cooperation and Voluntary Contributions to Public Goods, Scand J Econ 102 (2000), 23–39.

[12] J. Ledyard, Public Goods: A Survey of Experimental Research, in A.E. Roth, J. Kagel (Eds.), Handbook of Experimental Economics, Princeton University Press, Princeton, 1995, pp. 111–193.

[13] A. Chaudhuri, Sustaining cooperation in laboratory public goods experiments. A selective survey of the literature, Exp. Econ. 14 (2011) 47–83.

[14] A. Abbas, T.S. Amjath-Babu, H. Kächele, K. Müller, Non-structural flood risk mitigation under developing country conditions. An analysis on the determinants of willingness to pay for flood insurance in rural Pakistan, Nat. Hazards. 75 (2015) 2119–2135.

[15] W.J.W. Botzen, J.C.J.M. van den Bergh, Risk attitudes to low-probability climate change risks: WTP for flood insurance, J. Econ. Behav. Organ. 82 (2012) 151–166.

[16] A. Reynaud, M.-H. Nguyen, Valuing Flood Risk Reductions, Environ. Model Assess. 21 (2016) 603–617.

[17] G. Zhai, T. Sato, T. Fukuzono, S. Ikeda, K. Yoshida, Willingness to Pay for Flood Risk Reduction and its Determinants in Japan, J. Am. Water Resources Assoc. 42 (2006) 927–940.

[18] D. Castillo, F. Bousquet, M.A. Janssen, K. Worrapimphong, J.C. Cardenas, Context matters to explain field experiments. Results from Colombian and Thai fishing villages, Ecol. Econ. 70 (2011) 1609–1620.

[19] M.A. Janssen, A behavioral perspective on the governance of common resources, Curr. Opin. Env. Sust. 12 (2015) 1–5.

[20] P.A. Groothuis, J.C. Whitehead, The Provision Point Mechanism and Scenario Rejection in Contingent Valuation, Agric. Resour. Econ. Rev. 38 (2009) 271–280.

[21] M. Marks, R. Croson, Alternative rebate rules in the provision of a threshold public good. An experimental investigation, J. Public. Econ. 67 (1998) 195–220.

[22] C. Atzmüller, P.M. Steiner, Experimental Vignette Studies in Survey Research, Med. 6 (2010) 128–138.

[23] L. Wallander, 25 years of factorial surveys in sociology. A review, Soc. Sci. Res. 38 (2009) 505–520.

[24] J. Oll, R. Hahn, D. Reimsbach, P. Kotzian, Tackling Complexity in Business and Society Research. The Methodological and Thematic Potential of Factorial Surveys, http://journals.sagepub.com/doi/abs/10.1177/0007650316645337 (accessed 20.05.2017).

[25] J.J. Hox, I.G.G. Kreft, P.L.J. Hermkens, The Analysis of Factorial Surveys. Sociol. Method. Res. 19 (1991) 493–510.

[26] B.J. Taylor, Factorial Surveys. Using Vignettes to Study Professional Judgement, Brit. J. Soc. Work. 36 (2005) 1187–1207.

[27] M. Rungtusanatham, C. Wallin, S. Eckerd, The Vignette in a Scenario-Based Role-Playing Experiment, J. Supply Chain Manag. 47 (2011) 9–16.

[28] Badan Pusat Statistik, Village Potential Survey 2014, http://microdata.bps.go.id/mikrodata/index.php/catalog/599 (accessed: 03.02.2017).