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**Micro-finance for community based sanitation as a tool for climate adaptation and risk management tools: A case study from Semarang City, Indonesia**

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# Micro-finance for community based sanitation as a tool for climate adaptation and risk management tools: A case study from Semarang City, Indonesia

Jonatan A. Lassa and Jawoto Sih Setyono

## Abstract

This paper presents good practice and lesson from a community based sanitation microfinance initiative that recently adopted by Kemijen Village in Eastern part of Semarang City, Indonesia. The paper argues that micro-finance can be used as a community based adaptation planning of Semarang City if the conditions for sustainability can be controlled by local actors at the village level. The methods used in this study include: un-structured interviews with local communities, and relevant stakeholders in Semarang city. Secondary sources include project reports, accounting reports and existing literature on Semarang.

## Introduction and Background

It is projected that the majority of urban population growth in the next quarter century will occur in developing countries (Hallegatte and Corfee-Morlot 2011). Therefore, more and more people, assets and infrastructure and other types of wealth will be placed in the cities. Unfortunately, the cities are likely to face additional stressors from future climate extremes. Ports cities may face higher exposure to extreme hazards but their level of climate preparedness may be low and their degree of vulnerability varies greatly (Hanson et. Al. 2012; Hallegatte and Corfee-Morlot 2011). One of the likely scenarios is cities exposure to sea level rise (SLR) which manifests in inundation in coastal areas. While research communities over the last twenty years have been focusing on mega cities (Parker and Mitchell 1995; Nicholls (1995); Hocraimer and Mechler (2011)).

While attentions have been paid to mega risks in mega-cities and primary cities around the world (Wenzel et. Al. 2007), recently, Rockefeller Foundation has initiated a new focus on secondary cities in Asia such as India, Indonesia, Thailand and Vietnam. In Indonesia, the two cities were selected to be part of the Asian Cities Climate Change Network (ACCCRN) namely Bandar Lampung City and Semarang City. It is clear that some of secondary cities in the countries will graduate into 'mega' cities in the future prior to and after 2100. Unfortunately, there is still little reserch being done on the secondary cities. Some early rescue of the future mega cities can be made through building resilience of the present secondary cities.

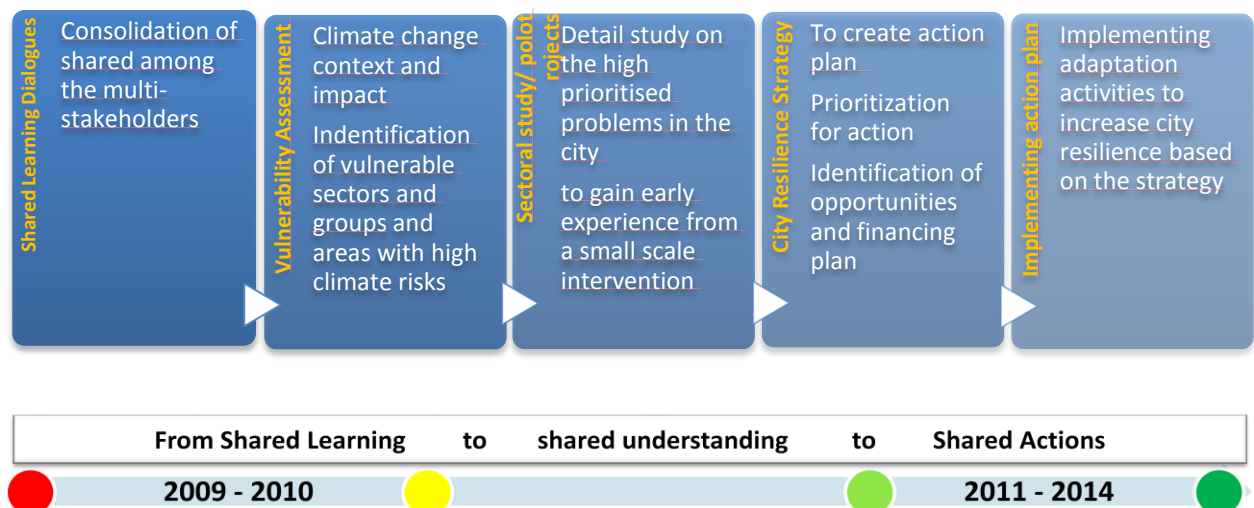
In particular, the Semarang City has been increasingly affected by different set of risks including climate risks. Some parts of the city are 'sinking' due to high rate of land subsidence coupled with an early indication of mean sea level rise (Chaussard et. al. 2013). Land subsidence is occurring in areas with compressible deposits. Scientists suggest that the subsidence is primarily caused by ground water extractionfor industrial and agricultural use.

The ACCCRN project has helped the cities to conduct several necessary steps in building disaster resilience communities. Several multi-stakeholders forums namely Shared Learning Dialogues have been held. Vulnerability assessments (VA) and cities resilience strategy have been drafted and adopted into local development planning and implementation. In Semarang, two types of VAs were conducted: First was science based assessment on technical dimension of climate science (CCROM et. al. 2010). Secondly was community based vulnerability assessment (Taylor 20110).

In Semarang City, ACCCRN Project has created a City Team which functions as a new mode of urban climate governance where decision making process is collectively represented by City Team, which

basically multi-stakeholder platforms comprises of relevant departments, civil society organizations, local universities and representatives (Lassa and Nugraha, forthcoming). Figure 1 visualizes the ACCCRN processes and activities in Semarang City over the last 5 years. The overall framework has been named as Urban Climate Change Resilience Planning Framework (UCRPF) which function as a process oriented framework as it "incorporates a specific set of process considerations and supports activities that can assist urban areas in planning, capacity building, implementing and supporting the continuous process of learning that is central to the growth and maintenance of urban resilience" (See Moench et. al. 2011, Tyler and Moench 2012).

Figure 1. ACCCRN Typical Process in Semarang City



Source: Internal ACCCRN Project Report/Presentation

In 2010, the City Team made a call for proposal to the relevant agents especially the non-governmental organization to propose innovative ideas which can be piloted in the most vulnerable communities in the city. All the applicants should consider brief results of vulnerability assessments of the Semarang City jointly produced by ISET (Institute of Social and Environmental Transition) and the Center for Climate Risk and Opportunity Management in South East Asia and Pacific – Institut Pertanian Bogor (CCROM SEAP IPB), Mercy Corps, and URDI, an Indonesian based NGO.

The city team decided to approve four pilots to address different hazards: landslides, flooding, coastal erosion, and storms. The vulnerability assessment suggests that there have been community adaptation activities taking place among the households in coastal areas where areas affected by flooding raised the level of their floors and fishermen entered the city’s informal sector, borrowing from informal lenders (loan sharks) to fulfil their daily needs. In order to protect fishponds and reduce coastal erosion, the City Team supported by a local NGO and municipal government, initiated and continued mangrove planting. The pilot projects in Semarang initially planned to be implemented from March until June 2010, but some of the projects’ completion was delayed until August 2010.

This paper investigates the sustainability of the ACCCRN intervention in a pilot project namely community based finance for urban sanitation. We argue that there is an existing research gaps

within both climate change adaptation and risk management communities especially on the role of micro finance for urban climate adaptation and urban risk reduction.

## **Project Location**

The location of the pilot project was in Kemijen Village in Eastern of Semarang City, local communities have been exposed to multi-risks including high rate of land subsidence (about -10 to -15cm annually), sea level rise, river flooding (as worsen by high sediment transport in the rivers). Based on existing loss model (due to floods and SLR), Kemijen Village have experienced an increase in economic loss (e.g. housing, productivity, education and health) over the last five years. Kemijen village experienced an increase in average annual household loss (in US\$ equivalent) from US\$ 600 in 2007 to US\$ 1800 in 2010. The most significant economic loss comprises of housing and productivity. Over the last three years, economic loss are also increasing (ISET 2010, Bintari (2007) and PLRT FT UNDIP (2010). Kemijen vulnerability is also exemplified by the fact that the village lack of services provided by the city water company. Many households should buy water from private sources which often costly (Taylor 2010).

## **Financing Urban Sanitation Adaptation Option**

The original idea of exercising a community-based revolving fund to support urban sanitation among the poor who suffer most from the urban flooding and land subsidence in Semarang City came from an NGO namely Perdikan in 2010 (now the NGO no longer exists). The project took place in Kemijen Sub District where the pilot project engaged poor female-headed households to improve their sanitation system through a revolving loan fund and to raise awareness among participants of climate issues. It looked for a model of microfinance that will improve the livelihood of poor female-headed families while simultaneously improving their sanitation condition.

Based on community based vulnerability assessment in Kemijen Village in October 2009 (Taylor 2010), female headed households were the most vulnerable groups to climate risks. Therefore, Perdikan with the support from Mercy Corps (ACCCRN Indonesia) decided to design a pilot project that seek to reduce the level of vulnerability of female headed households in the low lying coast of East Semarang City that often affected by sea inundation and flooding. It tried to simultaneously improve the livelihood and sanitation level of female-headed families that inhabit low laying coastal areas by implementing a credit scheme.

The objectives of the pilot project are to reduce vulnerable communities through an innovative model of climate adaptation namely scheme for sanitation. The very idea was to work through existing village finance institution in reaching the most vulnerable group. The sanitation fund was complemented by community educational awareness. Identified vulnerable groups can be enhanced to be adaptive to climate change. In addition, the model was expected to be replicated in other areas with similar situation as it created incentives to build the vulnerable community's resilience towards climate change through access of water and sanitation.

The pilot project was implemented during March-May 2010. Activities carried out to meet the objectives include:

- Participatory planning and assessment of female-headed families;
- Discussion with Community Resilience Board (BKM Kemijen) and neighborhood groups

- Female-headed families and Community Resilience Board (BKM Kemijen) meeting about VA result, the concept and impact of climate change and sanitation saving activity implementation.
- Regular meeting of female-headed families
- Serial thematic focus group discussion in ten sub-villages (neighborhood groups)
- Sanitation saving activity (implementation of revolving fund) for 25 female-headed families
- Climate Change Festival at village level.

These approach was perceived by Perdikan as “a new thing which integrate curative approach, community organising and institutionalization of ideas about climate change adaptation in local level” (Perdikan 2010)

From the outset, Perdikan applied the use of participatory planning approach in order to improve legitimacy of the intervention. The NGO presented the situation of women’s group and the idea of sanitation credit scheme. The participants identified potential beneficiaries of the program. Perdikan and BKM’s board members and KM discussed and drafted a plan concerning sanitation credit model. The participants finally drafted an MOU between BKM-KM and Perdikan.

The stakeholders involve in the proses included the Kemijen village institutions such as BKM (the community based micro-finance institution), sub-village structures, village women organisation (PKK) and village legislation body (LPMK). Given the size of the fund of the pilot project was too small, the stakeholders agreed to specifically target the most vulnerable group. Agreement on the criteria of the target groups were reached based on the followings: First, sanitation credit is prioritised for female headed households (FHHs) whose either poor sanitation facility or no sanitation at all at their house. The reason why FHHs is explained in different occassion namely participatory vulnerability analysis: women “have been deprived of a complete education and expected to maintain household duties, women, particularly in urban poor communities, are often those least able to avoid the impacts of climate events. Women may also lack the knowledge necessary in order to prepare for such events. If, for example, they are unable to work or study, women may not have the economic means or the information necessary to cope with change” (Taylor 2010: 344).

Cooperation mechanism beetwen the CBO and the NGO was arranged based on a MoU. The community organisations such as PKK, BKM and LPMK were committed to promote the sanitation credit to the female headed households in Kemijen and be ready to answer why only FHHs received the scheme. Community consultation meeting clarified some problems of terminology being used for the target groups. For positive reason, NGOs tend to use “female headed households” (FHHs) as a term. However, for the community, the term widow is more acceptable without further interpretation. The term “sanitation credit” was seen as misleading term in the sense that communities perceive the project as typical government project where the aid no need to be repaid? The BKM suggested a clearer term such as loan to be repaid.

BKM and Perdikan conducted specific meetings to detail the schemes of ‘sanitation loan’, **terms and conditions for loan**, and to identify the names of the FHHs. The Sanitation micro-finance or sanitation micro-credit is a joint initiative from *Badan Keswadayaan Masyarakat* (BKM), a CBO in Kemijen Village, and Perdikan Foundation. One of the condition inlcudes “there should be two guarantors (or from families). In addition, the candidate of recipient should receive a “free arrears”

status from BKM. Box 1 details the activities carried out by Perdikan during the course of the pilot project.

#### **Box 1. Summary of Activities by Perdikan**

- a) **Planning and Assessment.** Representative from the Community Resilience Board (BKM Kemijen) and neighborhood groups participated in the meeting. The agenda was on selecting the project's beneficiaries and also the development of revolving fund's mechanism and requirements. The proponent of the project also used the notion of credit to refer to the fund so that the community will understand that the fund should be returned; hence the terminology being used for the scheme is sanitation credit.
- b) **Sub-district awareness meeting.** The meeting was attended by 21 female-headed families, BKM Kemijen and other community groups to discuss the Semarang's Vulnerability Assessment. Information regarding climate change and its relevant impacts and measures to improve sanitation condition within their area.
- c) **Sanitation Credit Sanitation credit:** implementation of the revolving fund is the main activity of the pilot project. It was conducted in cooperation with BKM Kemijen. Implementation of the sanitation credit scheme was expected as will allow access for the direct beneficiaries to sanitation services and improvement of their sanitation facilities.
- d) **Regular Meeting of Female-headed Families.** The regular meetings aimed to enhance the direct beneficiaries' adaptive capacity towards climate change impacts and simultaneously drives cooperation amongst them in order to improve social control of the implementation. The meeting was also expected to enhance wider community's voluntary participation on the project.
- e) An Focus Group Discussion (FGD) was conducted with the intention to disseminate information on general concept of climate change and its subsequent impacts as well as information on the on-going sanitation credit scheme. The activity was conducted in cooperation with the local neighborhood groups with housewife and female community as the top priority participants. Throughout the project period, FGD had been undertaken in 10 neighborhood groups with a total attendance of 371 people. It is expected that the activity will help in enhancing community's awareness on climate change impacts and also the potential vulnerable groups.
- f) Climate Change Festival was undertaken with the intention to raise the awareness of general Kemijen Sub district's community on climate change impacts, especially its effects on vulnerable area such as Kemijen. Wide-array of stakeholders was involved within the activity, namely: government representatives (sub district-level and sub-district level), youth groups, female groups and children. Among activities that are part of the festival are: Kirab Tumpeng(traditional culture as a

## **BKM Micro-finance: history and policy approach**

BKM Kemijen have been considered as the most capable community based micro-finance institution in Semarang City (Delima Sari 2012) as it has been the most sustainable among the rest of BKMs in

177 urban villages in the city. It has good reputation as it have been a self-help CBO with 12 years experience in loan and saving services, microfinance fund management from both government and the World Bank urban project. BKM is not part of the village structure and it sees itself as an equal partner with village government of Kemijen. Total population of Kemijen is about 13,500 people (or about 4100 households). Density of population in Kemijen is 9,599 person/km<sup>2</sup> in 2010.

By the end of 2002, BKM Kemijen's total capital was only US\$ 10,000. Today (June 2012), the total account available for loan is about US\$ 60,000. BKM Kemijen have been able to sustain itself as a micro-finance institute. As of June It has 4 permanent staff dealing with daily operations of BKM. This is equivalent with US\$ 6600 annual spending for the staffing. The board members (comprises of sub-village representatives) meeting is the highest decision making body at BKM Kemijen.

Key milestones of BKM Kemijen 2000-2012 [BKM Kemijen 2006, 2009, 2010, 2011, 2012]:

- Established on 2 Feb 2000 facilitated by Urban Poverty Eradication Project (P2KP) of the World Bank. It received about US\$ 28,000 grants for revolving fund. Only community self-help groups (KSMs) can get access to the loan. At the start, BKM Kemijen provided supports to 30 KSMs (and continue to 50KSMs later on). However, in 2002, there was only left US\$ 10,000 for revolving funds. The gap was considered as non-performing loan (NPL). One of the reason why there is big NPL is due to the fact that the BKM policy during 2000-2002 only allocated for group loan (namely community self-help groups or KSM). The policy was made based on the requirement from the project.
- In 2002, only 9 KSMs sustained while the rest did not sustain. BKM board members evaluated the NPL as they tried to rescue the BKM from the collapse as other BKMs in Semarang. Decision by board members was made that BKM Kemijen could diversify options including decision to give credit to not only to groups but also personal requests. It was not fully approved by the project logic because "all the support was meant to be 'stimulant fund'. However, this decision was considered as necessary step to sustain the BKM. "A few members started to pay their installments but some others did not." Sarwono et. al. (2012)
- In 2003, BKM decided to start a new exercise namely daily loan for the poor neighbourhood. Any one who meet the criterias can borrow money for 1-3 months. The flat rate of this "daily loan" is 8%. The reason behind 8% is both social and economic. It social because it is has its social goal in giving financial access to the poor people in need. It is economic because BKM must sustain itself by calculating the risk and benefit based on their past experience. In general existing micro-finance and micro-credit institutions often offer monthly rate above 15%.
- In 2008, BKM Kemijen received additional US\$ 6000 grants from PNPM-Kota (National Project on Urban Community Empowerment).
- In 2010, BKM Kemijen started the "sanitation fund" initiative supported by Perdikan-ACCCRN with additional funds only US\$ 4000. The loan rate is 1.5%, where 5% will be returned to the debtor after they finish the scheme.
- Today (as of June 2012), BKM Kemijen have managed to have US\$ 60,000-65,000 in their account. Total asset (including office building) equals US\$ 45,000.



In the early setup of the project, the Sanitation Credit is one of the output of the shared decision making process made by City Team in Semarang supported by Asian Cities Climate Change Resilience Network (ACCCRN). The Perdikan-ACCCRN pilot project's timeframe was very short. It started from March 2010 to June 2010. In addition, There were delays in launching of the sanitation credit due to local major election. The reason for delays was to avoid some politician and information bias concerning the sanitation credit.

The legitimacy of the idea is high due to real risk as seen at the local communities. Some local community admitted that "If there are many widows here in Kemijen, it means that we have to pay back the loan so others can also get access to the credit." (*anon – one of the FHHs in one FGD on 30 April 2010*). When the pilot project ended, 26 FHHs received sanitation loan. 15 FHH received the support in April 2010, 5 FHH received the support in May and 6 FHH received the support in June. 22 FHHs used the loan to renovate their toilets and bathroom (MCK). While four FHHs used the loan to install clean water system from the city water company. 10 out of 15 FHH who received their loan in April 2010 made their first installment payment by end of June 2010. The other five FHHs decided to use their loan for installing water pipes from the PDAM of Semarang city. However, normal procedures often take months for water installation. Perdikan and BKM facilitated two meetings with the PDAM East Semarang. The water installation process was successfully made because PDAM facilitate the process as expected. The reason why it did not take lots of time is because PDAM is a member of City Team. The payment for the interest rate was adjusted with the timeline of the water installation. Since the installment payment is a 20 month basis, BKM and Perdikan have been committed to work beyond formal project timeframe.

**Table 1. BKM Kemijen Performance 2006-2011.**

Targeted beneficiaries	2006	2007	2008	2009	2010	2011
KSM (group)	2	4	11	17	14	13
KSM (personal)	26	19	120	89	67	61
Micro loan (personal)	46	56	55	90	77	67
Daily loan (personal)	224	185	205	219	182	149
Total reached person	296	260	380	398	326	277

**Perdikan's perception on constraints is based on their participatory evaluation process.** It was noted that expansion of sanitation credit is necessary as BKM needs to move from FHHs in order to reach other vulnerable groups in the village. Replication in other places is possible but lessons need to be made explicit as Kemijen have different social context. Other vulnerable areas can be considered to access similar initiative despite limited funds available for this pilot project.

- Lack of formal mechanism to support the present climate resilience building through sanitation credit. To put into long term views, present investment only solve some limited pressing (immediate) problems. However, given the extreme rate of land subsidence in the village, present investment are likely to be submerged in the next ten years.
- Participation from BKM and local communities allowed local communities to increase their control over the project. "This is revolving fund. Therefore, we will collectively monitor the progress. We will be watching if there are non-performing loan (Collective statement from FGDs among FHHs)

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Source: Authors' based on BKM Kemijen Annual Reports 2006, 2009-2012.

## Challenges and Reflection

Data suggests that BKM Kemijen have been able to sustain its function to serve the most vulnerable groups in need. Table 1 suggests that there is an increase in targeting group loan over the last six years since 2006. It has been able to increase its reach to poor households in terms of micro-loan. Our interviews suggest that most of the micro-loan during the last 10 years have been associated with household adaptation to sanitation and some primary public health concern such as water access and health concern.

It is clear that community based micro-finance can be used to address climate and disaster vulnerabilities in the city as exemplified by the case of "sanitation credit" of BKM Kemijen. The total allocated funds US\$ 4000 has been used to support 26 FHHs by June 2010. In June 2012, some of the returned funds have been used to give another four FHHs. However, the idea of up-scaling and extending the 'sanitation credit' have been extremely limited due to the lack of funds created by city government and other parties. Therefore, success have been largely isolated in the form of pilot project.

It was also found that the degree of vulnerability among the FHHs also varied. The most vulnerable FHHs turned out to be the candidate of NPL. Therefore, the most vulnerable of the vulnerable groups need to be supported by different mechanism. BKM accepted the offer from the NGO by setting low interest rate (at 1.5%) for the FHHs - this was both an institutional exercise and to increase coverage of their services. However, it was admitted that the present interest rate for "sanitation credit" is too low therefore seen by BKM as unsustainable. Therefore, they have limited incentives to promote the scheme after the intervention finished (Sarwono et. al. 2012).

NGOs' credit scheme such as Perdikan-ACCCRN is made based on lack of empirical exercises. BKM's board perceived sustainability differently as they believe that sustainability can be achieved if right from the outset, existing scheme is being used. Therefore, scaling-up and extending the supports can be a possibility as long as there is a clear metric calculation on the long term benefit for BKM. BKM maintained that 10% of their annual benefit is often allocated for social activities.

In addition, the present 'sanitation credit' in Kemijen Village has been proved useful in addressing some immediate problems. However, given the high rate of land-subsidence, as witnessed directly by local communities, all the investment (from BKM and also physical infrastructure project from the

city government) will eventually sub-merged in the next decade. Therefore, it is necessary for the city government to think longer term.

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