

**BEYOND FISHING? THE IMPACT OF MICROCREDIT ON
ALTERNATIVE LIVELIHOODS IN SOUTH SULAWESI,
INDONESIA**

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ABSTRACT

Indonesia has the most biologically diverse coral reefs worldwide. However, many marine areas of Indonesia, including the Spermonde Archipelago of South Sulawesi, have become increasingly degraded due to global environmental change and local pressures including coastal runoff and destructive fishing practices. As ocean health declines, small island villages of the Spermonde Archipelago experience food insecurity and growing levels of poverty. These small island communities face challenges in developing alternative livelihoods to fishing due to limited access to economic markets and resources. As conservation strategies evolve to better incorporate the importance of natural resources to people, microcredit has emerged as a possible tool in addressing both conservation and development objectives in the region.

Created in 1998, the Coral Reef Rehabilitation and Management Program (COREMAP) is a national conservation initiative that melds bottom-up and top-down policy approaches to protect coral reefs and empower the coastal and island communities that depend upon marine resources. One way in which COREMAP seeks to reduce pressure on marine resources is through the provision of small loans for the development of alternative livelihoods to fishing. Through 74 semi-structured interviews with loan recipients and village staff in eight small island villages, this study examines the impact of the COREMAP microcredit system on the generation of alternative incomes in the Spermonde Archipelago.

Results show that COREMAP small loans fostered the development of additional income sources to fishing. Although the COREMAP microcredit program achieved the development goal of income diversification, it has thus far fallen short of the conservation objective to reduce fishing pressure. The creation of alternative livelihoods is incredibly complex. Small island villages in Spermonde face small, variable incomes and limited livelihood opportunities. Microcredit may be unable to achieve conservation goals in the region without demonstrating its ability to support businesses that provide higher incomes than fishing. In light of these findings, this study recommends policy strategies that could address existing challenges to business success and program sustainability, including increased loan amounts, partnerships with private industry, funded positions for village COREMAP staff, regular loan repayment meetings, greater flexibility in loan repayment schemes, and a combined savings-credit approach.

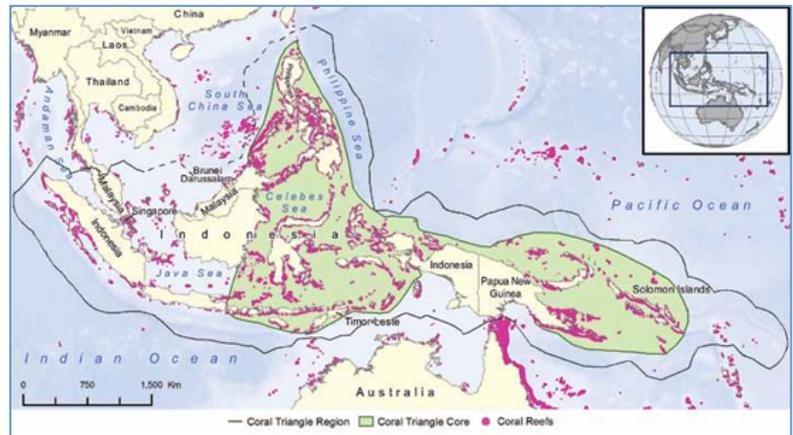
INTRODUCTION

Biodiversity Conservation in the Coral Triangle Region

Coral reefs are among the most productive and biodiverse ecosystems globally (Jackson 1991). The Coral Triangle is considered the epicenter of marine biodiversity, with approximately 75 percent of all coral species and 35 percent of all coral reef fish (Vernon et al. 2009). Located within this remarkably diverse region, Indonesia has the most biologically rich reefs worldwide (Burke et al. 2012; Hidayati 2003). However, 60 million people live on Indonesia's coasts, and these communities rely upon, and heavily impact, the country's coral reefs. Fisheries directly and indirectly employ approximately five million people in Indonesia, and overfishing and destructive fishing practices act as the strongest drivers of declining reef health (Burke et al. 2012; Indonesia National Plan of Actions 2009). Introduced to Indonesian fishermen in the 1980s, reef bombing and cyanide fishing have become pervasive throughout the country, affecting about 80 percent of reefs (Deswandi 2012; Burke et al. 2012). As these local threats work in concert with global climate change, Indonesia's coral reefs are becoming vulnerable to shifts in ecosystem function.

In light of intensifying local and global environmental impacts, efforts on the part of governments, conservation organizations, and development institutions to protect global biodiversity have continued to grow over the past two decades, with an influx in funding and an increasing number of policy frameworks aimed at achieving set biodiversity targets (Rands et al. 2010). With its incredible marine biodiversity, the Coral Triangle Region has become the focus of many large-scale biodiversity conservation partnerships, most notably, The Coral Triangle Initiative on Coral Reefs, Fisheries and Food Security, a multilateral collaboration between countries of the Coral Triangle. In an effort to realize regional biodiversity goals established

through this initiative, Indonesia has pledged to establish 20 million hectares of marine protected areas by 2020 (Indonesia National Plan of Actions 2009).



Map of the Coral Triangle, World Resources Institute

Although traditional strategies for conservation such as implementation of protected areas remain a key component of biodiversity policies, practices have evolved to better incorporate the importance of natural resources to people (Rands et al. 2010). As approaches to biodiversity protection begin to embrace concerns such as local community interests and poverty reduction, conservation objectives have converged with many development priorities (Rands et al. 2010). In particular, microfinance has emerged as a tool that may be able to achieve both conservation and development goals by addressing the multi-dimensional nature of poverty. Defined as “large-scale, businesslike provision of financial services to the poor,” microfinance can encompass services including credit, savings, insurance, and capacity-building (Roodman 2011). As the most popular form of microfinance, the terms microcredit and microfinance are often used interchangeably; however, microcredit is one form of microfinance that offers small loans to low-income households (Roodman 2011). The use of microfinance for both poverty reduction and conservation is still in its beginning stages; however, in some cases, microcredit systems in particular have been implemented with the aim of generating alternative livelihoods (for example, Patterson et al. 2008, Torell et al. 2007, and Jha and Bawa 2007). By providing the capital to develop small businesses in areas without many livelihood opportunities, some

microcredit programs have striven to reduce overexploitation of natural resources while increasing household incomes.

This research uses a case study of eight small island villages of the Spermonde Archipelago in South Sulawesi, Indonesia to further explore the effectiveness of microcredit in biodiversity conservation and poverty alleviation. This region of Indonesia is data poor, and it is difficult to draw definitive conclusions regarding fisheries decline. Data and the interviews of this case study do support the prevalence of destructive fishing practices and reduced habitat complexity as well as perceptions of reduced catch (Burke et al. 2012; Chozin 2008; Pet-Soede et al. 2001; Edinger et al. 1998). Through semi-structured interviews, the study evaluates the microcredit financing system initiated by the Coral Reef Rehabilitation and Management Program (COREMAP), a countrywide conservation program focused on the protection of Indonesian coral reefs. This case study offers new insight to the discussion of microfinance and conservation by considering the livelihood development challenges specific to small islands. Due to limited access to economic markets and resources, the development of alternative income sources on small islands remains an underexplored area of study.

In order to examine the interconnections between coral reef conservation, microcredit, and livelihood development, this paper will take the following structure. First, the paper will discuss COREMAP, the program's goals, and its use of microcredit as one strategy to achieve program objectives. Second, the paper will consider the key ways in which microfinance has evolved since its rise in popularity in the 1970s, its benefits and limitations, and some examples of its implementation to date in conservation contexts. Third, the paper will provide an overview of the study region in South Sulawesi, Indonesia and the materials and methods used. Fourth, the paper will explore the findings from semi-structured interviews with 67 loan recipients and 7

COREMAP microcredit program advisers in light of COREMAP program priorities. Finally, the paper will conclude by offering recommendations for how to move forward with COREMAP's microcredit financing program.

The Coral Reef Rehabilitation and Management Program (COREMAP)

In the late 1990s, Indonesia's marine resources were in noticeable decline. With overlapping management authorities between the Ministry of Forestry, the newly created Ministry of Marine Affairs and Fisheries, and provincial level governments, oversight of marine resources was disconnected and unclear (Fox et al. 2005; Hidayati 2003). In response to these gaps in natural resource management strategies, the Coral Reef Rehabilitation and Management Program (COREMAP) was created in 1998. Funded by the World Bank and the Asian Development Bank and implemented by the Indonesian government, COREMAP is a critical national conservation initiative that strives to integrate diverse stakeholders in marine governance, engaging with government sectors, non-profits, universities, private industry, and communities (Hidayati 2003). COREMAP seeks to merge top-down and bottom-up policy approaches by combining an overall national framework for marine resource use with a strong emphasis on community participation in local program design and implementation (Hidayati 2003; Moosa n.d.). COREMAP's ultimate goals are coral reef protection and empowerment of the coastal and island communities that depend upon these resources (COREMAP; Hidayati 2003; Moosa n.d.).

COREMAP is designed to be carried out in three phases over the course of 20 years (COREMAP). The first phase, lasting from 1998 to 2004, involved the development of policy frameworks at both the national and local levels as well as the implementation of pilot programs in select provinces, including the study region of South Sulawesi (COREMAP; Hidayati 2003).

From 2004 to 2011, the second phase of COREMAP concentrated on expanding pilot community-based management systems to other provinces across the country (COREMAP; Hidayati 2003; Personal communication, Nov 15, 2012). COREMAP will begin its final phase in 2014, focusing on the establishment of institutional sustainability and livelihood development (Hidayati 2003; Personal communication, Nov 15, 2012). COREMAP therefore offers a long history of program implementation from which to learn.

Overall, COREMAP activities are overseen by provincial and district level fisheries agencies, and directly implemented by members of village communities hired as program staff (Hidayati 2003). Although general requirements remain the same for all program sites, the specific design and implementation of COREMAP programs can vary from village to village according to community input and creativity (Hidayati 2003). At the village level, COREMAP's central activities are: 1) development of community managed and enforced no-take marine protected areas, 2) education, outreach, and capacity building, and 3) small loans for the development of alternative incomes to fishing (Hidayati 2003). As noted above, the microcredit program for the generation of alternative sources of income is the focus of this study. As COREMAP's mission is the conservation of coral reefs, the microcredit program was initiated in an attempt to limit overall fishing effort and destructive fishing practices through the opportunity to develop small businesses (Hidayati 2003). In this way, the program seeks to mitigate the impact of the designation of no-take marine protected areas on local livelihoods.

At the village level, COREMAP offices manage loan distribution and repayment. Each village has a microfinance officer, who gauges interest in the loan program, processes loan applications and assesses ability to repay, and oversees loan repayment. Each village in this study has received two installments of 50,000,000 rupiah (the equivalent of approximately 5,500

USD) over the period of 2008 – 2012. The number of islands in each village surveyed in this research ranged from one to as many as four; however, each village was provided with the same amount of money for its microcredit program, regardless of village population size. Loan recipients in each village received loans ranging from 500,000 rupiah (approximately 55 USD) to 2,000,000 rupiah (approximately 220 USD), depending upon ability to repay. The interest on all loans is one-and-a-half percent. Microfinance officers track loan distribution and repayment in log books, and loan money is redistributed to new applicants or prior recipients as loans are repaid. Thus, the ability for additional members of the community to receive microcredit loans is contingent upon the timely repayment of loans by other members of the community. COREMAP hires members of each community to serve as microcredit program facilitators, and these facilitators are responsible for reminding loan recipients about repayment due dates and collecting repayments. One interviewee noted that COREMAP employees within the villages are paid for the first three months of their work with the microcredit program, and from that point forward responsibilities are carried out on a voluntary basis (July 31, 2012).

Microfinance, Conservation, and the Development of Alternative Livelihoods

Since its rise in popularity in the 1970s, microfinance has become a key development tool in efforts to alleviate poverty across the globe (Roodman 2011; Banerjee et al. 2010). A rapidly expanding number of microfinance institutions have served as many as 195,000,000 clients as of December 2011 (Microcredit Summit Campaign; Banerjee et al. 2010). Although the most well-known example of microfinance is Nobel Prize recipient Muhammad Yunus's Grameen Bank in Bangladesh, many approaches to microfinance have emerged over the past 40 years in light of growing lessons learned from implementation (Roodman 2011; Banerjee and Duflo 2010).

Microfinance institutions now take the form of government, non-profit, and for-profit institutions, and can specialize in or bundle services including credit, savings, insurance, and capacity-building (Roodman 2011). Regardless of the approach used, microfinance institutions ultimately seek to deliver financial services to the poor in a manner that maximizes the number of households reached while maintaining institutional sustainability (Roodman 2011).

In recent decades, development goals have broadened to focus on human rights and freedoms, as best embodied by global commitments such as the United Nations Millennium Development Goals (Cao 2011; Roodman 2011; Banerjee et al. 2010; UN Millennium Development Goals). By allowing for investment in individual enterprise at lower institutional costs, microcredit strongly aligns with global visions for development and has quickly become the most widespread form of microfinance (Roodman 2011; Banerjee et al. 2010). With its growing popularity, global funding has been funneled into microcredit, and development institutions have promoted microcredit as the leading strategy for reducing poverty and hunger, improving access to primary education, and strengthening gender equality (Banerjee et al. 2010). However, an increasing number of critics have begun to question whether the available evidence substantiates the rhetoric of microcredit's promise (Roodman 2011; Banerjee et al. 2010). As greater numbers of microcredit institutions flood the market, borrowers are beginning to default on multiple loans and critics have raised concerns that an emphasis on microcredit as a panacea has replaced more effective strategies for poverty alleviation (Roodman 2011; Banerjee et al. 2010).

To date, only three randomized experiments on the impact of microfinance have been conducted: two studies on microcredit and one on microsavings (Roodman 2011). The two studies on microcredit show no effect one to two years after receiving a loan on standard

indicators of household welfare including income, education, and health, raising doubts in microcredit's ability to lift borrowers out of poverty (Roodman 2011). However, microcredit has been shown to have some positive impacts on business development (Banerjee et al. 2010). Banerjee and colleagues have demonstrated through a randomized evaluation of microcredit in Hyderabad, India that loan recipients with a preexisting business or with a high propensity to start a new business can benefit from credit (2010). By examining the changes in household expenditures of loan recipients, Banerjee and colleagues found that both borrowers with existing businesses and borrowers starting new businesses used loans as additional capital to invest in business growth (2010). Loan recipients starting new businesses also reduced spending on temptation goods in an effort to have additional available capital for business development (Banerjee et al. 2010). The randomized study of microsavings in Kenya revealed that savings services also supported investment in business development, in addition to improving measures of household welfare (Roodman 2011). Studies to date are limited and more research is needed to determine the long-term impacts of microfinance; however, these findings are particularly relevant to the design of conservation programs focused on the development of alternative sources of income.

Although its true impacts have thus far fallen short of expectations, microcredit can still support development goals by increasing personal agency, providing a measure of control over volatile incomes and adverse circumstances (Roodman 2011). As studies on microcredit evolve, many researchers have uncovered ways to adapt some of the common features of microcredit in order to better serve low-income households. In order to lower the administrative costs of providing small loans to low-income households, most microcredit programs include the following elements: 1) formulaic products, 2) group liability, although this approach has become

far less common in recent years, 3) “dynamic incentives” that reward on-time repayment with better future loan terms, 4) short loan terms of one to two years, 5) frequent, regular repayment requirements that begin immediately after loan disbursement, and 6) requirements for a proportion of the loan be put in savings (“forced savings”) (Roodman 2011; Banerjee and Duflo 2010).

A foundational aspect of early microcredit systems such as the Grameen Bank, group liability was once considered a key approach to providing small loans on a large scale (Banerjee and Duflo 2010; Giné and Karlan 2007). Through this method, loans are given to a group of borrowers who select the other members of their group. Borrowers are then responsible for ensuring that the other members of their group repay the loan on time. Group liability therefore creates incentives for borrowers to choose group members who will be able to meet loan repayments and to monitor the actions of group members (Banerjee and Duflo 2010). However, group liability can limit innovation, as borrowers are likely to put pressure on fellow group members not to engage in risky business decisions (Banerjee and Duflo 2010). In a field experiment in the Philippines, Giné and Karlan compared default rates between group loans, group loans that were converted into individual loans, and purely individual loans (2007). In all groups, default rates were the same, and members of group loans were more likely to drop out as a result of group pressure (Giné and Karlan 2007). In light of the limited success of group liability, microcredit institutions are increasingly moving toward individual loan policies. However, as Banerjee and Duflo highlight, group liability may still play an important role in areas where the temptation to default is high (Banerjee and Duflo 2010; Giné and Karlan 2007).

The provision of dynamic incentives is another approach often implemented by microcredit institutions that strives to limit default rates. Dynamic incentives encourage

repayment by offering the opportunity of a larger loan or improved loan terms in the future (Banerjee and Duflo 2010). In a study in South Africa, Karlan and Zinman invited loan applicants to borrow at a high interest rate, and then surprised half of the participants with a lower interest rate than initially stated (Banerjee and Duflo 2010). Of those participants offered a lower interest rate, a subgroup was given the incentive to keep the lower rate in future loans (Banerjee and Duflo 2010). Of all groups, those participants offered the opportunity for continued lower interest on future loans had the highest rate of repayment (Banerjee and Duflo 2010). However, as Banerjee and Duflo note, dynamic incentives alone may not be able to overcome the temptation to default in practice, particularly if other loan options remain available (2010).

Although microcredit institutions typically provide one-year loans with weekly loan repayment requirements, Field and Pande have explored the effectiveness of these standard repayment requirements (2008). Based on the economic theory that tailoring repayment requirements to better align with business cash flows may reduce occurrences of loan default, Field and Pande examined the influence of flexibility on repayment in Calcutta, India (2008; Banerjee and Duflo 2010). In this study, borrowers were randomly assigned to one of three repayment conditions: a weekly repayment schedule starting immediately after receiving the loan, a weekly repayment schedule with a few weeks grace period before beginning repayment, or a monthly repayment schedule (Banerjee and Duflo 2010; Field and Pande 2008). Findings reveal that those loan recipients with more flexible repayment terms were happier with their loans and more likely to start a business or make a riskier business investment. In addition, these borrowers were not any more likely to default on their loan than borrowers with stricter repayment requirements, at least initially (Banerjee and Duflo 2010; Field and Pande 2008).

However, loan default rates in the monthly repayment group exceeded those of the weekly repayment groups after three loan cycles (Banerjee and Duflo 2010; Field and Pande 2008). Those loan recipients with stricter repayment requirements met weekly and, as a result, were more likely to know other members of the group well (Banerjee and Duflo 2010). Because borrowers that met more often tended to value the opinion of other group members, defaulting on a loan became embarrassing (Banerjee and Duflo 2010). Thus, social capital and trust can play a key role in loan repayment (Banerjee and Duflo 2010).

Developing combined credit and savings accounts may be another means to overcome challenges to effectively providing microcredit to low-income households (Roodman 2011). In a rural area of Bangladesh, a pilot program called P9 offers small, no-interest loans on the condition that one third of the loan is deposited in a no-interest savings account (Roodman 2011). By requiring that a proportion of the loan be placed in a savings account as forced savings, the borrower ends up with a net savings at the end of the loan period (Roodman 2011). The program allows loan recipients to repay on their own schedule, and to repeat the borrowing and saving cycle with larger amounts of money (Roodman 2011). Once a certain amount of money has been saved through this method, the loan recipient has the option to continue the borrowing and savings program, withdraw all the savings, or convert the account to a savings account with interest (Roodman 2011). As the randomized studies discussed above have revealed that only microsavings has achieved development goals for poverty reduction thus far, this flexible approach of merging credit and savings may provide a realistic means for improving the impact of microfinance.

In some cases, microcredit institutions incorporate training and capacity building into loan programs in an effort to foster more lasting development (Roodman 2011; Araya and

Christen 2004). In addition to the financial capital provided through small loans, these institutions emphasize the importance of advice, supplies, and access to markets as critical components for supporting entrepreneurship and human development (Roodman 2011). For example, the microcredit institution BRAC in Bangladesh provides borrowers with services such as health education and small business skills (Roodman 2011). Some experts critique this integrated approach as financially unsustainable, and question whether these institutions sacrifice expertise by trying to offer too many services. However, a study on a Peruvian microcredit program that bundled its provision of small loans with business training shows that integrated services can lead to higher, more stable incomes and more reliable loan repayment (Roodman 2011). Although service bundling may cause microcredit institutions to sacrifice a level of financial sustainability, the provision of training and capacity building by microcredit institutions can address broader human development goals.

As the implementation of microcredit continues to evolve, a growing number of conservation programs have recognized the complex interconnections between poverty and natural resource degradation and have begun to incorporate the use of microcredit into conservation strategies (Araya and Christen 2004). Without a set salary, low-income households, particularly those dependent upon natural resources for their livelihood, face volatile incomes that vary by day and by season (Roodman 2011; Araya and Christen 2004). In regions where natural resource exploitation is one of the few available sources of livelihood, conservation initiatives have striven to reduce local pressure on natural resources by offering small loans in support of the development of alternative livelihoods (Araya and Christen 2004). The provision of financial services can reduce the vulnerability of the poor by creating opportunities for

business development, income diversification, and savings, offering these households an income buffer during times of greatest need (Roodman 2011; Araya and Christen 2004).

To date, conservation programs have focused their efforts primarily on microcredit and capacity building rather than on broader financial services (Araya and Christen 2004). These case studies share similar goals to COREMAP of creating greater awareness of biodiversity's importance, encouraging community-based protection and management of local natural resources, and supporting the generation of alternative income sources (Patterson et al. 2008; Torell et al. 2007; Jha and Bawa 2007). Implemented across the globe, the case studies of integrated conservation and development programs offer valuable lessons learned in the use of microcredit to achieve both biodiversity conservation and poverty alleviation. These case studies reveal the following themes: the need for training and skill development, the need for the strategic development of businesses that meet market demand, and the need for loan sizes and repayment periods that better align with the financial flows of small businesses (Patterson et al. 2008; Torell et al. 2007; Jha and Bawa 2007) These themes will be explored in greater detail below and hold important implications for the implementation of the COREMAP microcredit financing program, as discussed in this paper's results.

Many conservation initiatives have noted the need for a greater emphasis on training and skill development in programs that seek to lessen local impact on natural resources by generating alternative income sources. In a study in India, Jha and Bawa undertook a quantitative analysis of Ecodevelopment, a microfinance institution that seeks to support both environmental sustainability and poverty reduction (2007). In light of Ecodevelopment's focus on poverty and environmental impacts, this study explored the success of a microcredit program in an area of Tamil Nadu state adjacent to a tiger reserve (Jha and Bawa 2007). Findings revealed that those

small businesses with the greatest profits and the most consistent history of loan repayment had existed for a longer period of time and had employed more specialized skills in their businesses (Jha and Bawa 2007). As a result of these findings, Jha and Bawa recommended future conservation programs seeking to generate alternative livelihoods through microcredit concentrate on building expertise in specialized skills (2007).

In addition to fostering the development of unique skills, case studies highlighted the need for conservation programs to support livelihoods that align with broader market needs (Patterson et al. 2008; Jha and Bawa 2007). In a study in southeastern India focused on coral reef protection in coastal communities, Patterson and colleagues explored the effectiveness of a five-year microcredit program that drew upon existing Self Help Groups, a village-based approach to banking where group members use accumulated savings to provide small loans (Roodman 2011; Patterson et al. 2008). In partnership with government institutions, this microcredit approach offered training in several alternative livelihood strategies, including crab and lobster fattening, cephalopod aquaculture, value-added processing of bycatch, and composting to create fertilizer (Patterson et al. 2008). Through lessons learned from implementation, Patterson and colleagues determined that the most successful small businesses effectively used local resources to meet broader market demand. This finding is also supported by efforts to develop livelihood alternatives on small islands. On small islands in Southeast Asia and the South Pacific, programs have focused on aquaculture using low-cost materials, building the capacity of local communities to cultivate aquarium trade species and other high-value species such as giant clam (O'Garra 2007; Briggs 2003; Crawford 2002). Within the Spermonde islands in particular, Mars Symbioscience has trained households in low-cost methods for raising sea horses, and has connected these small businesses to markets in Bali (Konsorsium Mitra Bahari). These programs

foster specialized skills that meet broader market demands, and have provided higher incomes for participating households over the long-term (Konsorsium Mitra Bahari).

Finally, case studies of existing conservation programs with a microcredit component additionally identified a need to design loan programs that fit the financial flows of the small businesses created by low-income households (Torell et al. 2007). For example, Torell and colleagues evaluated the impact of a collaboration between the district government in coastal Tanzania and FINCA International, a microcredit organization that uses group lending to provide small loans (2007). The program considered the ways in which FINCA loans could support collective seaweed culture and tour guide small businesses in the region (Torell et al. 2007). Torell and colleagues discovered that many loan applicants turned down the FINCA loan or used loan funds to develop a different type of business than seaweed culture or the provision of tour guide services (2007). With the small size of FINCA loans, loan applicants either found the loan process unappealing or felt that the funds were only sufficient to start a small business such as food or drink kiosks (Torell et al. 2007). Borrowers with seaweed culture businesses additionally complained that the requirements for loan repayment were incompatible with their growing season. These loan recipients either fell behind on loan repayment or chose to invest loan funds in businesses that yielded smaller profits but were better-suited to FINCA's loan repayment cycle (Torell et al. 2007). FINCA chose to incorporate greater flexibility in their repayment policies as a result of these findings (Torell et al. 2007). Ultimately, Torell and colleagues found a disconnect between coastal management goals and microcredit processes (2007). FINCA loans allowed for the development of second or third livelihood strategies, reducing the vulnerability of low-income households by providing the opportunity for income diversification (Torell et al. 2007). However, as FINCA focused on institutional sustainability rather than the use of loan

funds, local businesses supported through the program did not achieve the conservation goal of reducing pressure on local natural resources (Torell et al. 2007).

MATERIALS AND METHODS

Study Region and Target Population

As noted above, this study seeks to determine the impact of COREMAP's microcredit financing system on the development of alternative livelihoods to fishing in the Spermonde Archipelago. Located in the province of South Sulawesi, the Spermonde Archipelago is a part of the district of Pangkep. The archipelago consists of 120 small islands, stretching from the coast of South Sulawesi to the Java Sea. Approximately 80 of these 120 islands are inhabited (Chozin 2008). The nearest major cities to the Spermonde islands are the province capital of Makassar and the city of Pangkajene, where the district fisheries agency is located. As the province's capital, Makassar has several universities, including Hasanuddin University (UNHAS), an institution with a highly-regarded marine studies program and a marine lab located on one of the Spermonde islands. UNHAS also leads one of the country's most successful Sea Partnership programs, a collaboration between the university, government, non-profit organizations, private business, and communities modeled after the U.S. Sea Grant Program. Therefore, many of the Spermonde island communities have interacted with university researchers and students and this study contributes to a growing body of knowledge on the Spermonde Archipelago developed by UNHAS and the South Sulawesi Sea Partnership.

The Spermonde Archipelago falls within three subdistricts of Pangkep: Liukang Tupabburing, Liukang Kalmas, and Liukang Tangaya. This research was conducted in the subdistrict of Liukang Tupabburing due to its proximity to the two major cities of Pangkep.

Liukang Tupaburring is comprised of 21 villages, six of which are coastal communities and 15 of which are small island communities. As the focus of this study is on the development of alternative livelihoods in small island settings, only the fifteen small island villages were used to create the sampling frame. Although sampling of villages in the subdistricts located further from major cities would provide critical insight into the impact of access to markets on livelihood development, the research needed to be limited to villages located within a two- to five-hour boat ride from Makassar and Pangkajene due to constraints on study funding and time. This limitation could contribute to a sampling bias in the findings of this study.

Village community members in the study region who received COREMAP microcredit loans between 2008 and 2012 are the target population of the study. The village microfinance officer and COREMAP facilitators play a critical role in the development of the community's microcredit lending and repayment system, as the systems used are the result of their creativity and innovation. Interviews with village microfinance officers and COREMAP facilitators were therefore also included in the study, when these staff were available on the islands.

Sampling Approach, Interviewing Method, and Study Period

From a sampling frame of the fifteen small island villages within Liukang Tupaburring, eight villages were randomly selected by choosing from a shuffled pile of village funding proposals. The eight villages include: Mattiro Deceng, Mattiro Langi, Mattiro Kanja, Mattiro Bulu, Mattiro Sompe, Mattiro Baji, Mattiro Bombang, and Mattiro Bone. Although drawn at random, the villages of the study are geographically distributed across all areas of the subdistrict Liukang Tupaburring. All microcredit loan proposals are kept in the COREMAP office of each village. Interviewees were randomly selected within each village studied by mixing the pile of paper loan applications and selecting every tenth proposal. In the case where there were a more

limited number of loan applications stored in the COREMAP office, every fourth proposal in the pile was chosen. Within each village, eight to nine loan applicants were interviewed. In some situations, the village loan proposals were not available, and interviewees needed to be selected according to community knowledge of their loan application. In other instances, the randomly selected interviewee was on the sea fishing and a family member of his household was interviewed in his place. Although these situations were unavoidable, both may contribute to selection bias or potential inaccuracies in data and results.

Overall, 67 microcredit loan recipients and 7 COREMAP staff were interviewed. All interviews were carried out in compliance with an approved IRB protocol and on a completely voluntary basis. In-depth interviews were conducted in a semi-structured style, where a list of questions served as a reference but the interviewee's thoughts guided discussion (Bernard 2011). Interviews covered topics including: loan use, business importance to household income, challenges in business development, and feelings toward additional financial services such as savings. All interviews are a translation from Bahasa Indonesia or the local dialect of Bahasa Makassar to English.

Interview data was collected from July through August 2012, with approximately two days spent in each village of the study. The entire study was conducted from December 2011 to April 2013, including informal and formal data collection within Indonesia as well as data analysis.

Data Analysis

Interview data was analyzed using Nvivo 10, a qualitative software program that allows for the organization of data into themes and the identification and analysis of data trends.

RESULTS AND DISCUSSION

Demographics

Before delving into the findings of this study, the following section provides a brief overview of key demographics of the population. Interviewees range in age from early 20s to late 60s, and most commonly fall within the age group of 31 to 40 years old. The COREMAP program requires that at least one third of loan recipients be female. As a result, 36 of the interviewees in this study are female and 31 are male. The mean monthly household income for interviewees is 2,400,000 rupiah (approximately 267 USD).

Findings

As noted above, the Coral Reef Rehabilitation and Management Program seeks to conserve Indonesia's coral reefs and empower the village communities that depend upon these resources. In light of these key priorities, COREMAP implemented a microcredit financing system that offers small loans to village households in support of the development of alternative sources of income to fishing. In most households on the Spermonde islands, fishing is the primary source of livelihood. Destructive fishing practices have driven environmental decline in the Spermonde Archipelago, and many interviewees of this study have reported reduced catch (Chozin 2008). Households in these villages are faced with variable daily incomes, and have increased their fishing efforts to earn enough income to meet household needs. Therefore, the central goal of COREMAP's microcredit program is to reduce pressure on marine resources by addressing the volatility in household income that drives village communities to degrade local marine resources.

These findings therefore explore the interview responses of 67 loan recipients and 7 COREMAP staff in an effort to address the following questions:

1. Have program goals, as stated above, been achieved?
2. What challenges to business success exist in the villages surveyed?
3. What challenges to the sustainability of the microcredit program exist?
4. How could existing practices support program sustainability?

Have program goals been achieved?

In order to determine the impact of microcredit on the development of alternative sources of income to fishing, this study explored the extent to which program small loans funded fishing activities directly and the extent to which the development of small businesses reduced fishing effort in households. The 67 loan applicants interviewed reported the following uses of loan money, in descending order from most common to least common use: 1) fishing equipment, including gear, fuel, and small boats; 2) products purchased in major cities for sale in a small kiosk, including snacks, daily goods, and clothes; 3) baking materials for a cake or bakso business; 4) daily living expenses; 5) seaweed culture; and 6) boat carpentry. Of the 3 most common uses of loan money, 32 respondents purchased fishing equipment, 23 respondents purchased kiosk goods, and 10 respondents purchased baking materials, although some respondents reported more than one use of loan funds. Therefore, approximately half of respondents used COREMAP loans to support continued fishing activities.

The implementation of the COREMAP microcredit program can vary from village to village according to local vision and needs, as noted above. In an effort to consider the ways in which local objectives may guide the use of program funds, this study additionally evaluated differences in interviewee use of loans across villages. Of the eight villages considered in this

study, half strongly focused microcredit funding on fishing livelihoods, with 60 percent or more of interviewees in these villages using loans to support fishing activities. This emphasis on funding for fishing activities is closely linked to village priorities. For example, some village programs decided only to provide loans for the development of fishing businesses, despite the fact that the use of funds in this manner goes against broader COREMAP goals (July 15, 2012).

Although the central objective of the microcredit program is to foster the development of alternative livelihoods to reduce pressure on marine resources, many villages overlook the critical role fishing effort plays in environmental decline. In one village, microcredit officers chose only to fund loan proposals that “did not subvert COREMAP program goals” (July 11, 2012). Microcredit officers in this village sought to support COREMAP objectives by refusing to provide loans to applicants with a reputation for using destructive fishing practices such as reef bombing and cyanide fishing until they demonstrated that they had changed their fishing methods (July 11, 2012). However, declining the loan applications of these fishermen limited any opportunity for the most destructive fishermen to develop alternative income sources and reduce their fishing impact. Therefore, although village leadership can prove instrumental in the implementation of local microcredit systems, these local stakeholders should hold a shared vision of broader COREMAP goals in order for the program to be effective.

This study additionally considered the extent to which the development of small businesses reduced fishing effort in households. As a part of each interview, loan recipients discussed how often they or members of their households went fishing, and whether the time the household spent fishing changed as a result of the development of their small businesses. Of the 67 households included in this study, 51 interviewees reported that at least one member of the

household earned a living through fishing; these results reveal that just over 75 percent of all households in this study depend upon fishing as a key contributor to household income.

The species caught and the type of gear used by village communities varies across islands of the Spermonde Archipelago. Interviewees reported fishing for species including finfish, sea cucumber, crab, squid, and octopus with a wide range of gear types such as bombs, dive compressors, trawls, nets, and hook and line. Of the 51 households that consider fishing a central livelihood, 48 households stated that their fishing effort remained the same after receiving a COREMAP loan. Depending on the type of species targeted and available fishing equipment, interviewees described spending 12 hours per day to months away at sea. In the few households where the generation of alternative income sources decreased time spent fishing, interviewees explained that the additional income from their small businesses provided them with greater flexibility; the fishermen of these households no longer went to sea during inclement weather or poor health, although they still depended upon fishing to build household income (August 2, 2012). COREMAP's microcredit system may be able to mitigate some of the income volatility experienced by low-income households through the diversification of income sources; however, as demonstrated by interview responses, a limited number of small businesses were profitable enough to lessen reliance upon fishing. Therefore, although the COREMAP microcredit system addresses some development concerns by expanding available livelihood strategies, the program has fallen short of conservation objectives to reduce fishing effort.

What challenges exist to business success?

As noted previously, the development of livelihoods on small islands remains a challenge due to limited access to resources and economic markets. Microcredit may offer a critical means

to diversify available livelihoods in this context. In order to understand the ways in which the COREMAP microcredit financing system could better target the needs of small island villages, this study evaluated existing barriers to business success. In light of interviewee responses to central challenges they face in developing their small businesses, the following themes emerged: lack of financial capital, competition, and limited access to broader markets. These three interconnected themes will be explored further below.

Almost all interviewees in this study stated that lack of financial capital was the primary barrier to the growth of their businesses. As described above, COREMAP small loans range from 500,000 rupiah (approximately 55 USD) to 2,000,000 rupiah (approximately 220 USD). With strong interest across villages in participating in the microcredit program, COREMAP strove to maximize the number of loans provided by offering smaller loans to a greater number of community members. However, by distributing program funds in this manner, these small loans had a more limited impact on individual business development. Although many interviewees noted that the COREMAP loan was helpful in supporting their business, some interviewees stated that the limited funds inhibited them from expanding their businesses to meet local demand. One interviewee explains, “Many people place orders with me for specific goods, but often I do not have enough capital upfront to sell the goods that they request” (July 17, 2012). Business development can require higher upfront investment in order to generate profits. Although COREMAP loans can allow for further business development through the purchase of low cost materials or goods, the loan amount is not enough to foster continued business growth.

Given their small size, COREMAP loans have the greatest impact when used in support of pre-existing businesses. However, some loan recipients did use funds to start new businesses. Although several interviewees had hoped to use loan money to start businesses that required

higher initial investment such as a fuel supply business or a community fish processing plant, limited loan funds narrowed the types of businesses loan recipients could feasibly start. As one interviewee notes, “My wife started a kiosk for daily goods because she felt that the loan was not enough to start any other kind of business” (July 10, 2012). By limiting loan amounts, the COREMAP microcredit financing program could unintentionally constrain individual innovation and available livelihood opportunities. As will be discussed in greater detail below, these limited business opportunities may increase competition and ultimately hinder business success, as greater numbers of loan applicants flood the market with similar services. In addition, although the COREMAP microcredit program strives to support alternative livelihoods to fishing, the small size of loans may prevent fishermen from pursuing these opportunities for alternative incomes. For example, one interviewee explained that “[he] would like to change professions from fishing to a kiosk or another business because [fishing] income is not regular, but there is not enough capital available” (July 15, 2012). In this way, the structure of COREMAP’s lending system may inadvertently hinder its broader program goals for conservation and poverty alleviation.

Larger loans could help loan recipients to pursue a wider range of livelihoods; however, microcredit programs seek to achieve the sometimes conflicting goals of advancing individual entrepreneurship and ensuring loan repayment. Determining appropriate approaches to lending therefore requires microcredit institutions to find a balance between providing loans that are large enough to support business growth and profitability without risking loan applicant default. In this study, some loan recipients preferred to apply for smaller COREMAP loans several consecutive times rather than request one, larger loan due to a fear that they would be unable to meet repayments. One interviewee explains, “I applied for, and received, a COREMAP loan in

2010, 2011, and 2012. I applied three separate times instead of applying once for a larger amount of money because I was afraid it might be difficult to repay a larger loan with my husband's fishing income" (July 11, 2012). The need for more financial capital to invest in business development also resulted in an opposite outcome, where village members applied for loans from multiple programs, risking default with several institutions. Although interviewees with multiple loans acknowledged that monthly repayments could be difficult, many reported seeking out several loans at once despite these obstacles in order to further develop their businesses. As discussed in greater detail in later sections, dynamic incentives that award on time loan repayment with better loan terms in the future, greater flexibility in loan repayment, and hybrid credit-savings systems may all offer a means to address the challenge of designing appropriate lending systems to support business growth for low income households.

Competition can serve as another critical barrier to business success in small island contexts. Many factors have contributed to the emergence of similar types of businesses on the Spermonde islands including: fewer educational opportunities for training and skill development, limited financial resources to invest in business development, and a lack of access to broader economic markets. In light of these challenges, COREMAP loan recipients seeking to generate alternative income sources to fishing most commonly invest in the development of small kiosks selling daily goods or food because these businesses require minimal outside training and meet local demand. As one interviewee explains, "I chose to establish a kiosk because the job is not work intensive to do" (July 31, 2012).

In the villages of this study, community opinion is strongly valued, and there is a tendency for community members to follow the example of others, whether in businesses development or, as will be discussed in the following section, in meeting monthly loan

repayments. In this way, as community members have observed the success of kiosks, an increasing number have decided to start similar businesses in order to profit as well. Small kiosks have less start-up costs and require only a limited skill set, causing this market to be more accessible to a broader range of community members interested in starting new businesses; however, the number of small kiosks has exceeded local demand for these products and services, and many interviewees have noted a decline in their profits as a result of a rise in kiosks in their villages. As an interviewee notes, “Although I depend on the income from my business more now, with the increasing number of competitors, my income from the kiosk has decreased” (July 11, 2012). Those few businesses that have continued to grow have identified a niche market in demand; for example, as the only kiosk to sell rice in her village, one interviewee saw an expansion in her business and greater profits than most other loan applicants included in this study. In light of these findings, Spermonde island villages could benefit from specialized trainings that build their expertise in marketable skill sets and connect their small businesses to broader markets beyond their local communities. Through the development of specialized skill sets such as aquaculture production, village communities could expand beyond small kiosks to create businesses that would provide higher and more sustainable incomes. As touched upon earlier, the work Mars Symbioscience is undertaking on the Spermonde islands in sea horse culture offers an example of feasible, higher income livelihoods local communities could pursue with training and access to broader markets in other regions of Indonesia and internationally.

The third key challenge to business development expressed by interviewees in this study is a lack of access to broader economic markets. Studies recognize market access as one of the greatest barriers to livelihood development in small island contexts (Albert 2010; O’Garra 2007; Crawford 2002). Fishing is the primary source of livelihood for most households on the

Spermonde islands, and the growth of small businesses is inextricably tied to the availability of marine resources. As fishermen report reduced fish catch and experience longer time at sea, they also face more variable incomes; in turn, fishing income drives demand for local goods and services, and the small businesses of the Spermonde islands face declining profits without access to markets beyond their local villages. As one kiosk owner notes, “My income depends on how much the fishermen earn. When the fishermen go to sea for several days and have cash, they will buy a lot of goods and I will earn more money. When the fishermen do not have cash, they buy on credit and then it is difficult for me to develop my business” (August 1, 2012).

With the central role fishing livelihoods play in the Spermonde islands, continued availability of marine resources and long-term income sustainability are inherently intertwined. Volatility in fishermen income as a result of environmental degradation reverberates throughout the local economy. One interviewee emphasizes this interconnection between local natural resource wealth and the success of village small businesses by stating, “If the fishermen on the island are not catching fish, then my income decreases. Some people on the island will borrow goods [from me] like rice and sugar and pay me later because they do not have the money. It becomes difficult to rotate capital” (July 18, 2012). As long as fishing remains such a critical part of village livelihood strategies, local businesses on the Spermonde islands will suffer the same profit variability. As noted by the interviewee above, many kiosk owners are asked to provide goods on credit, preventing them from managing their businesses in a manner that would foster continued growth. The income generated by small kiosks is limited and a need exists to foster the development of businesses that draw upon a specialized skill set. In this way, the generation of sustainable alternative income sources on the Spermonde islands is dependent upon two critical factors: building the capacity of village communities to create products that meet consumer

demand such as the culture of high-value marine species and connecting these small businesses to broader economic markets.

What challenges exist to program sustainability?

As described above, microcredit programs often share common elements that ensure long-term program sustainability by lowering the administrative costs of providing small loans to low-income households. However, in reducing the administrative costs of small loans, microcredit institutions often must sacrifice greater flexibility and more tailored products. Development scholars have explored the possibility of adapting traditional aspects of microcredit systems so that these programs can better meet the needs of low-income borrowers. The COREMAP program shares many of the long-established components of microcredit systems including formulaic products, dynamic incentives, short-term loan periods, and frequent repayment requirements that begin immediately after loan disbursement. The following section considers lessons learned from implementation of the COREMAP microcredit financing system, as well as the ways in which the program could be designed to better ensure long-term sustainability on the Spermonde islands.

Although the implementation of the COREMAP microcredit program can vary according to village vision and needs, some common challenges in the design of loan incentives and in the repayment process have emerged across most villages included in this study. As noted above, dynamic incentives encourage loan repayment by offering the opportunity for future loans or improved future loan terms. The COREMAP microcredit program has sought to incentivize loan repayment by making eligibility for future loans dependent upon repayment of current loans. Village systems in this study prioritized loan applicants with a history of on time loan

repayments. Some village programs also offered increasing future loan amounts as an incentive to meet monthly loan repayments; however, COREMAP microcredit funds are recycled after repayment from current borrowers to additional loan recipients, and this incentive was hindered in practice by the limited overall funds allocated to the program and by problems with loan repayment, as discussed further below.

One COREMAP village microcredit officer described the value of using dynamic incentives by stating, “Although COREMAP is also a government program, it does not have the same problem [with repayment as previous government-run credit programs] because people’s thinking has evolved. They want to pay back the loan because they want to be eligible for another. If people repay to COREMAP on time, they are eligible for a second loan. If they are not good at repayment, COREMAP will not allow them to have a second loan” (July 16, 2012). In this study, dynamic incentives carried particular weight in poorer households. As loans offer an opportunity for additional income stability, lower income households had a greater fear that poor repayment history would preclude them from future COREMAP loans. As one interviewee explains, “I do not want to miss a monthly payment completely because I am afraid the COREMAP adviser will think that I am lazy and will write a report about it that will not allow me to take out future loans” (July 11, 2012).

Despite success in some households, dynamic incentives became ineffective in villages where borrowers felt unwilling to repay loans as well as in villages where lead microcredit officers are not invested in overseeing the lending process. On the Spermonde islands community opinion is highly valued, and community members have a tendency to follow the example of others, particularly those members with higher social standing and power. As one interviewee states, “In our village, if a leader gives agreement, others will follow” (July 15,

2012). The example of fellow village members or neighboring communities therefore plays a central role in loan repayment, where the refusal to repay a COREMAP loan by an individual or group has spiraled into loan defaults throughout entire villages. Before the introduction of microcredit programs, aid provided to the villages in this study was entirely free. This precedent of free assistance has caused many community members to feel that the repayment of COREMAP loans is unnecessary, and has encouraged other community members to default on their loans as well out a desire for fairness. As one interviewee describes, “COREMAP loan repayment has stalled because some of the wealthy people on the island who received a loan do not want to repay it. They think that the loan is free, and that it should not be necessary to repay it. People with less money in the community follow this example because they find it unfair for poorer people to need to repay loans when richer people do not” (July 18, 2012).

In some villages, flexibility in repayment afforded to fishermen has driven other village members to refuse to repay COREMAP loans. As a result of reduce catch, many fishermen travel further from their villages to fish. These fishermen are away from home for longer periods of time, and have missed multiple loan repayments as a result. Many COREMAP loan recipients in these communities have also stopped repaying their loans out of a desire for greater fairness in repayment standards. As one microcredit officer explains, “Income in the village has decreased overall due to a decreasing fish population and fishermen go further away to fish. They are not in the village to repay their loan each month. [Other] people in the village have the ability to repay, but they do not because the fishermen are not [repaying] and they are following their example. They feel it goes against fairness” (July 15, 2012). Although in these villages pervasive loan defaults have been initiated by different circumstances, the importance of community example and the desire for equal standards for all loan applicants extends to all villages in this study. As

discussed by Banerjee and Duflo, defaulting on a loan saves the borrower repayment of the principal and interest. As a result, loan default can become an appealing option for low-income households, and dynamic incentives often must be used in concert with additional strategies to ensure repayment and microcredit program sustainability (2010). In light of the power of community influence in this region, loan collection strategies that draw on public opinion and social capital such as regular group loan collection meetings as discussed by Field and Pande may help to overcome the problem of pervasive loan defaults (2008).

Loan repayment has slowed in many villages of this study not only as a result of community example and influence, but also due to the limited effort put forth by some local COREMAP staff. In this way, local leadership plays a critical role in the sustainability of COREMAP microcredit systems. Those villages with COREMAP staff that were less invested in the microcredit program had higher occurrences of loan default. In several villages in this study, the microcredit officer in charge of overseeing the program spent much of his time in one of the main cities in South Sulawesi, only visiting his home village occasionally to manage loan dispersal. In one village in particular, loan applicants reported waiting as long as a year from the time they were approved for a COREMAP loan until they received the funds. Without local leadership to spearhead oversight of the lending process, the microcredit systems in these villages broke down. Some of this lack of leadership can be attributed to misaligned incentives. The salaries of lead microcredit officers are limited, and the COREMAP facilitators responsible for loan collection only receive a salary for their first three months of work. As one interviewee explains, “Part of the problem is there is no reason for COREMAP employees to try hard and to be invested in repayment collection. [Loan] collectors are only paid for the first three months and then they execute their responsibilities on a voluntary basis” (July 31, 2012). In other words,

unless local employees believe strongly in COREMAP goals, they lack the necessary incentives to manage program funds in a manner that ensures long-term program sustainability. In extreme cases, misaligned incentives have led to incidences of corruption, where interviewees in several villages either reported missing microcredit program funds or noted a lack of transparency in the lending process. By providing competitive, year-long salaries to staff, COREMAP may be able to realign incentives such that local employees are more invested in oversight of the program.

Although lack of leadership and investment can limit the effectiveness of village microcredit systems, it should be noted that decisions regarding lending can be very complex in small island contexts. Each village in this study is comprised of approximately 3,000 people or less, and many loan applicants are relatives or friends of COREMAP staff. Several microcredit officers explained that approving loan applications can be a challenging process for them; although they want to help their family and friends, microcredit officers must also keep loan repayment in mind. One loan recipient describes this challenge by stating, “Being the COREMAP microcredit officer is difficult because you want to be fair but not everyone can repay the loan. There is an existing tension of who needs the loan most and who can afford to have a loan” (August 2, 2012). In some cases, microcredit officers have been more lenient in following program standards out of compassion for community members. As one microfinance officer explains, “I feel bad collecting repayments from people in the community that I know cannot afford to repay, so I do not ask and I let them pay later” (July 31, 2012). Village COREMAP staff’s personal connection to borrowers will continue to add complexity to the lending process; however, greater flexibility in loan repayment may offer one means to balance providing support to poorer households and ensuring program sustainability, as discussed further below.

In an effort to maximize its impact in village communities, the COREMAP program uses short-term loan periods and frequent repayment requirements that begin immediately after loan disbursement. This approach allows for the recirculation of limited program funds to additional loan applicants. However, fishing is the primary source of livelihood in the villages of this study, and, without access to broader economic markets, fishing income supports other small businesses on the Spermonde islands. As fishermen face increasingly variable daily incomes as a result of reduced catch, households struggle to meet monthly loan repayments with an irregular income. By emphasizing short-term loans with repayments that begin immediately after loan disbursement, the COREMAP program overlooks the critical role that fishing income plays in loan repayment.

With limited available capital and a volatile income, most fishermen in the region are a part of a patron-client system called the ponggawa-sawi system. Ponggawa provide loans or equipment to fishermen, and these fishermen agree to sell their catch only to the ponggawa at a discounted price in order to pay off their debt. Ponggawa control the fishermen's access to broader economic markets and offer them a low price for their catch such that they remain unable to fully repay their loan (July 12, 2012). Although a need for financial capital drives fishermen to continue to seek out loans from local ponggawa, many fishermen in this study have expressed a feeling of entrapment in this patron-client system. As one interviewee describes, "I turn to a ponggawa for capital. It is difficult to be free from the ponggawa. After one or two [boat] motors had broken, I needed to take out another loan from the ponggawa again. I now have five to six loans to pay for boat motors with no new way to repay what I owe the ponggawa. It is difficult to be free" (July 18, 2012).

The ponggawa-sawi system is deeply embedded in the culture of the fishing communities of this study. Despite the ways in which the system limits business development and controls access to markets, the ponggawa-sawi loan system is well-adapted to the realities faced by fishermen. As one interviewee highlights, “The bank is not familiar with working with fishermen and the job’s constraints. The ponggawa is flexible. I do not have to pay a ponggawa every month and there is no time limit [to the loan]” (August 2, 2012). The regular repayment cycles characteristic of microcredit programs were created to ensure discipline in loan repayment. However, studies reveal that the requirement to begin repaying loans immediately after disbursement can cause borrowers to act more conservatively in their business investments (Banerjee and Duflo 2010). The experiences of low-income households on the Spermonde islands reflect this finding, where interviewees reported asking for multiple, smaller loans that had less impact on the development of their businesses out of a fear of repayment requirements. Most households in this study rely upon a variable daily income, and flexibility is therefore essential to their ability to meet loan repayments. Compared to the long-standing ponggawa-sawi system, microcredit is a relatively new approach to lending in the region, and a credit program that incorporates greater flexibility in the timing of loan repayments may better meet the needs of Spermonde households and help to lessen their dependence on ponggawa loans.

How could existing practices support program sustainability?

Existing local practices could inform the creation of more lasting approaches to the provision of microcredit on the Spermonde islands. In response to interview questions regarding their feelings towards savings programs, approximately half of the interviewees in this study described their participation in a local practice called an arisan. An arisan is a group of about 20

to 40 women who agree to each contribute a set amount of money either weekly or monthly to a group pool. At regular intervals, the arisan selects one person at random from the group to receive all of the savings. This person is then responsible for repaying the loan back to the group. Arisan members continue to contribute money into the group pool and repay funds until every member's name is chosen in the lottery. For those members chosen at the beginning of the lottery cycle, an arisan acts similarly to a small loan. Many interviewees reported using arisan funds for business development, child education, and household needs. For those members chosen towards the end of the arisan lottery, the arisan acts similarly to a savings account, where a certain amount of money is set aside for later use. Similar systems to the arisan, called Rotating Savings and Credit Associations (ROSCA), can be found worldwide in communities with limited access to financial services (Roodman 2011; Araya and Christen 2004).

Many interviewees decided to participate in an arisan because the practice required them to set aside a portion of their household income, and removed the temptation to spend money that could otherwise be saved. As one interviewee explains, "I joined the arisan because it is like saving. I did not save money on my own because if I had money, I would want to buy everything. The arisan keeps the money safe. I did not start a savings account in a bank because the bank is far away. It is a high cost to go to [the mainland] to only save money. It would cost as much to get there as I wanted to save" (August 1, 2012). With such high costs in using traditional savings accounts, the arisan offers a feasible way to save by entrusting the funds to other members of the community. However, some interviewees expressed concerns about arisans. Faced with a limited income to meet household needs, many interviewees found it difficult to envision having the additional money to set aside as savings and preferred to have the flexibility of saving at their own pace, rather than being pressured into setting aside money each week or

month without knowing when their name would be chosen from the lottery. As one interviewee notes, “I am not a part of an arisan because I do not have enough extra money to meet the payments. I agree with a savings program because it would be my own money. It is more flexible. There is no need to repay like in an arisan or with a loan so there is no timeline I need to follow. It is at my own pace” (July 11, 2012).

Although they differ in their feelings toward the arisan system, most interviewees in this study expressed a desire for a mechanism to save money. In light of the recent finding that microsavings may be the only microfinance service with demonstrated success in poverty alleviation, the implementation of a hybrid credit-savings system in the Spermonde islands may be the best means to support alternative livelihood development in the region. Expanding the COREMAP program to include a “forced savings” component where a portion of the loan is set aside as savings could offer village communities a local and reliable means to save money. Much like the P9 system in rural Bangladesh, a portion of the COREMAP loan would be set aside as savings until the entire loan is repaid (Roodman 2011). At that point, loan recipients could have the flexibility of continuing to save through the program at their own pace or closing their account if they were unsatisfied by the savings program, as discussed in the recommendations section below.

RECOMMENDATIONS

The findings of this study reflect many of the experiences to date of the use of microcredit in conservation contexts. Thus far, the use of microcredit on the small islands of Spermonde has allowed for the diversification of income sources, addressing some of the vulnerability experienced by low-income households in the region; however, efforts have fallen

short of conservation objectives to reduce fishing pressure. Small island villages in Spermonde face variable incomes and limited livelihood opportunities. Fishing on the Spermonde islands has been practiced for generations and ponggawa-sawi systems are longstanding. As a result, the creation of alternative livelihoods to fishing is incredibly complex. Microcredit may be unable to achieve conservation goals in the region without demonstrating its ability to support businesses that provide higher incomes than fishing. In light of this finding, the following section offers recommendations of steps that could be taken to foster the development of higher income businesses as well as the long-term sustainability of the microcredit program.

Increased Loan Size

The COREMAP microcredit program provided each village in this study with two installments of 50,000,000 rupiah (the equivalent of approximately 5,500 USD) over the period of 2008 – 2012. In this way, approximately 11,000 USD have supported business development to date in each village, many of which are comprised of up to four separate islands. As a result of inadequate program funding, each village must recirculate funds among hundreds of loan applicants, limiting the loan amount provided to each borrower to a maximum of 2,000,000 rupiah per loan (approximately 220 USD). Under this system, future borrowers are also reliant upon the repayment of other members of the community. Although many interviewees noted that COREMAP loans were helpful in supporting their small businesses, insufficient program funding often prevented loan recipients from expanding their businesses to meet local demand. Interviewees additionally reported choosing to develop less profitable businesses as a result of limited available financial capital. The ability of borrowers to repay remains a critical factor in

determining the appropriate loan amount. However, an increase in loan amount would allow for the creation of dynamic incentives and would better support individual entrepreneurship.

Development of Partnerships with Private Industry

As the findings of this study reveal, limited capacity and access to markets serve as the greatest challenges to livelihood development on the Spermonde islands. A limited skill set causes village communities to start similar businesses, and the growth of these businesses are constrained by local competition and variable fishing success. Training in specialized businesses that can earn stable, high incomes such as aquaculture of high-value species offer a feasible opportunity for livelihood development on small islands. As demonstrated by the work of Mars Symbioscience on the Spermonde islands, partnerships with private industry can provide the necessary expertise in the development of aquaculture as well as facilitate connections to broader economic markets for aquaculture products. In this way, private industry partnerships could help Spermonde small island villages to create feasible businesses that align with market needs, link to markets in other regions of Indonesia and other countries, and build their capacity to oversee a small business.

Long-Term Salaries for Village Staff

The long-term sustainability of the COREMAP microcredit program rests upon the enthusiasm and dedication of village staff. As interviews demonstrate, the creativity and commitment of village employees shape the way in which the program is implemented at the local level. Without local desire to design innovative approaches to the provision of microcredit, loan disbursement becomes inefficient and loan default increases. Village staff are currently

provided with either limited yearly salaries or are only offered a salary for the first three months of their participation in the COREMAP microcredit program. As a result, in many villages, few people are invested in overseeing the microcredit process. The provision of long-term, higher salaries for all village COREMAP staff would better align incentives to effectively manage the program and would promote greater accountability to district and provincial COREMAP offices.

Regular Loan Repayment Meetings

In many villages in this study, the decision of some community members not to repay COREMAP loans has led to widespread loan default throughout villages. As some interviewees note, community opinion is highly valued in villages on the Spermonde islands, and the example set by fellow village members or neighboring islands can strongly influence the actions of other community members. In this way, loan collection strategies can draw upon the power of community influence to better ensure program sustainability in the region. As discussed above, Field and Pande found that weekly meetings among members of group loans helped to build trust and cooperation among them (2008). Currently, COREMAP village staff travel from house to house to collect loan repayments or individuals bring their loan repayments directly to loan collectors. By collecting repayments regularly from groups of borrowers, the microfinance program may be able to use the influence of public opinion to achieve higher repayment rates.

Greater Flexibility in Loan Terms

In an effort to recirculate limited program funds, the COREMAP microcredit program offers only one-year loans and requires that monthly repayments begin immediately after loan disbursement. Regular repayment cycles are commonly used by microcredit institutions to ensure discipline in loan repayment. However, as the interviews of this study demonstrate, these loan

requirements often cause borrowers to become risk adverse. Many interviewees preferred smaller loans out of a fear of repayment requirements, despite the more limited impact small loans had on the development of their businesses. Some interviewees also chose to invest in less profitable types of businesses as a result of repayment requirements. Greater flexibility in repayment requirements could be achieved through measures such as loan repayment schedules that better align with the cash flows of prevalent businesses on the Spermonde islands and a grace period between loan dispersal and the first loan repayments. Greater flexibility could increase both repayment rates and borrowers' happiness with their loans; however, studies suggest that this approach should be used in concert with other strategies that ensure loan repayment such as group loan collection meetings, as touched upon above.

Combined credit-savings system

Most interviewees expressed a desire to save money, but felt that the temptation to spend available money on household needs prevented them from saving on their own. Given recent studies thus far show that only microsavings has succeeded in achieving development goals, incorporating a savings component into the COREMAP microcredit program may be a critical way to support livelihood development on the Spermonde islands. A hybrid credit-savings system where a portion of the loan is set aside in a local savings account managed by COREMAP village staff could provide a feasible and reliable way for community members to save on their own terms, an aim expressed by many interviewees. Once the entire loan is repaid, COREMAP borrowers could have the option to continue the savings account at their own pace. Savings would not only offer much needed additional income during times of limited business profits, but would also support continued business development.

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