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COMPLEMENTARY CURRENCIES FOR SUSTAINABLE DEVELOPMENT IN KENYA: THE CASE OF THE BANGLA-PESA

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ABSTRACT

This paper is a report on the development of a complementary currency system that allows Kenyans in informal settlements to trade goods and services and meet sustainable development objectives. The system in this report, Bangla-Pesa, uses a 'collaborative credit' model through a network of local business, whose owners often struggle to meet their basic needs (also known as 'mutual credit'). The paper documents the reasons for its creation, how it was launched, the immediate positive benefits upon launch, and some of the difficulties faced. Bangla-Pesa is shown to have facilitated, upon its launch, exchanges of roughly 50 Euros in value per day among 109 businesses, which is projected to raise living standards in the community primarily through the utilization of excess business capacity. After only a week of circulation - Bangla-Pesa represented an estimated 22% total trade among community members. This system's implementation and governance model are detailed with the aim of improving upon and replicating the model for future sustainable development programs.

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1. INTRODUCTION

Sustainable development is widely understood as a form of progress that incorporates economic, social and environmental factors (Adams, 2008). Monetary and financial services innovation is viewed by many development actors as a way forward for sustainable development and poverty elimination. Leveraging the financial lending world for the benefit of the poor was one of the key motivations for Micro-Finance as envisioned and championed by the Nobel Laureate Mohammed Yunus. But according to Bateman (2010) over the years micro-finance has been used by many as a tool for usurious profit making, rather than empowerment, as it has often been used to entice poor people into high interest loans. While concerns grow over micro-finance, traditional donor funds for development are declining in various regions, as a result of the Western economic crisis. In this context, novel approaches to financing development need to be considered.

One possible innovative mechanism for financing development is to "monetize" the spare capacities of business networks in the areas targeted for development assistance, by creating a new means of issuing and clearing credits amongst businesses. These systems are sometimes called 'mutual credit', 'reciprocal exchange', 'complementary currency' or, the term we use here: 'collaborative credit' (Bendell, 2014). In a collaborative credit system, according to a common agreement, peers extend credit to each other, which is often denominated in a non-monetary currency they create to measure the value of exchanges. The success of such systems for networks of large businesses in developed nations is one reason for such a hypothesis.

In corporate circles, these collaborative credit systems are often referred to as Reciprocal Trade, or Barter Networks, and have been used for decades by corporate networks to weather inflation, economic slumps and external market competition. According to Z/Yen (2011) they have been a key tool in improving cash flow, increasing working capital, and providing a source of interest free credit. For example, the WIR bank in Switzerland started in 1934 and registered over 60,000 businesses by 2010, all of which trade using a credit alongside the national currency to support one another and defend against monetary fluctuations. Notably, Studer (1998) gave an in depth analysis of the famous WIR Bank in Switzerland in which the WIR was been identified as one of the key tools keeping Switzerland's business community stable. Stodder (2000) concluded the WIR CC's ability to promote economic stability by producing a counter cyclical effect with the Swiss Franc.

There is some evidence that collaborative credit systems can benefit small-scale community empowerment programs (Bendell and Greco, 2013; Greco, 2009). Practitioners, as well as some published academic literature, suggests that CCs can have an effect on economic sustainability, which can be loosely defined as a community's resilience from the negative effects of internal and external economic forces (Z/Yen 2011). Beneficial social impacts sometimes result from CC's ability to create networks and promote

social services. Environmental sustainability may also be enhanced through a CC's ability to promote localization and fund environmental services (Ruddick 2011). However, some analysts argue that collaborative credit systems have limited positive impacts at community level (Dittmera, 2013).

Despite being a technological and logistical hub for East Africa, over 50% of Kenya's population lives in extreme poverty (Kristjanson 2010). One manifestation of this poverty is rapidly growing informal settlements (slums). Alder (1995) describes informal settlements as densely populated areas where residents have little or no property rights and often occupy the bottom economic tier of society. These communities face numerous challenges due to glaring socio-economic marginalization, lack of property rights, poor education levels and minimal access to infrastructure, health and social services. According to a Habitat (2003: Table B.2) study, the annual urban population growth rate in Kenya will be 3.14 percent over the next 8 years, reaching 21 million people in 2020. The study went on to state that in developing nations over 50 percent of urban populations live in informal settlements and as much as 70 percent in Kenya. Due to their size and rapid growth all over the world, sustainable development efforts should be directed towards such informal settlements.

Informal settlements may be especially well suited to reap the benefits of collaborative credit systems due to their density and diversity of businesses, acute scarcity of a medium of exchange, lack of market stability and absence of public services. Further, Kenya has a rapidly shifting cultural context which can be quick to adopt new economic systems and technologies, as evidenced by the near ubiquitous use of mobile phone banking. From this, we determined that an informal settlement in Kenya represented an ideal location to introduce and analyse the effectiveness of collaborative credit systems as a development intervention.

This paper will examine whether the benefits of CCs that are being realized by networks of corporations in developed nations, could apply in impoverished communities, such as informal settlements. The case study analysed here is the Bangla-Pesa, a collaborative credit clearing system, or reciprocal exchange which involves agreements to trade goods and service using a determined amount of credit, in the form of a printed voucher, usable by everyone in the network. In May 2013, 109 businesses were participating, to utilize their excess capacity and assist in local economic stability. After only a week of circulation community members were using Bangla-Pesa for an estimated 22% of their trades. As collaborative credits become more widespread, special attention must be paid to analyse and mitigate their risks and propose governance models to keep these systems safe to use and free from abuse. Therefore, this paper reports lessons learned in Kenya and suggests paths forward in implementation, research and monitoring and evaluation related to using collaborative credit systems as a tool for sustainable development.

Organizations like Red Cross have been using “Complementary Currencies” in the form of food vouchers to meet aid objectives for decades. In these systems, selected food distributors are chosen and vouchers are given to the needy that can be redeemed at such chosen distributors. However, initiatives like the Bangla-Pesa provide new means of exchange that are not dependent on donor funds, and are not yet widely practised within the development assistance community. Therefore innovations in collaborative credit systems need urgent study, which we seek to address in this paper.

This paper begins with a description of the establishment of the Bangla-Pesa. This description is based on notes made by the lead author of this paper, William O. Ruddick, who is a principal initiator of the Bangla-Pesa program. Then the paper outlines the theoretical basis for this work, which helps to define the project objectives to evaluate. We outline the methodology for a rapid evaluation of the impact of the Bangla-Pesa, and present initial results, before discussing the significance of and lessons learned from the Bangla-Pesa case.

2 PROGRAMME DESCRIPTION

Koru-Kenya (Koru) is a Kenyan community based organization whose purpose is to grow communities’ ability to access their own abundance. It is a partner with Community Forge, a Swiss non-profit from which Koru derives much of its inspiration. Koru initiated the Bangla-Pesa program in the Kenyan informal settlement near Mombasa known as Bangladesh by organizing roughly 200 small businesses into the Bangladesh Business Network (BBN). Network members use a collaborative credit to mediate exchanges of goods and services. The Bangla-Pesa is the unit of credit within this collaborative credit clearing (or multilateral reciprocal exchange) system which provides a means of exchange complementary to official money. The Bangla-Pesa was used with a value on parity with the Kenyan Shilling in order to represent member’s goods and services. The community officially launched the Bangla-Pesa on May 11th 2013. Baseline data in this paper was collected in April 2013, and follow up surveys were conducted in the weeks following the launch. In this section we summarise the initial steps in the establishment of the programme.

In November 2012 Koru’s team began discussions with community members and elders to determine if the program would be welcomed. This initiative was loosely based on the experience of a previous exchangeable complementary currency scheme in 2010, called the Eco-Pesa (see Box 1).

Finding no resistance and much enthusiasm, the program began with community discussions co-facilitated and mobilized by a local youth group. These and later meetings represent crucial elements of program implementation as they provide both avenues through which to explain collaborative credits and opportunities for community members to become involved in the creation of such systems. Initial meetings were held with more than 100 local business owners covering topics including: benefits and challenges of using a collaborative credits, barter and how it is already being used in the community, and how money is used for barter and in general in the community. In the workshops, a demonstration was done to simulate barter systems and collaborative credits using coloured paper, which helped to identify how a collaborative credit system could increase economic activity. These activities, as well as a network mapping exercise and subsequent discussion, made participants aware of the interconnectedness of the business community and the potential for increasing local trade.

Project coordinators then discussed the potential benefits of different types of Complementary Currencies in these workshops. The proposed system was described as “mutual credit” in which every business, after passing some criteria, would be allocated vouchers redeemable with any member of the network. Businesses receiving the vouchers would be required to accept as much as they spend, seeking to always return to the initial amount. The discussions highlighted some potential challenges, including:

- *Challenge:* If a member spends all his or her vouchers without accepting vouchers for the purchase of goods or services at their shop. *Solution:* Use guarantors, so that, before becoming part of the network and being given vouchers, a business must have 4 other business that will vouch for them. These businesses promise to spend vouchers with and receive vouchers from the new business, as well as accept them from customers if the new business refuses.

Research Activities	2013		2014												2015			
	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr
Initial community meetings																		
Baseline survey																		
Launch / relaunch																		
Legal wrangles																		
Follow-up surveys																		

Figure 1: Schedule of Various implementation and research activities

- *Challenge:* If someone accepts vouchers but then doesn't spend them back into circulation. *Solution:* Select a community liaison that educates and encourages businesses to spend their vouchers on a daily basis.

Discussions also identified challenges with administration, the need for guarantors to back up member commitments and systems to deal with problems. The community embraced the program with the hope that that one potential benefit would be steady trading in the community when Kenyan Shillings were scarce. The community then suggested that the program be monitored closely, that the collaborative credits be printed with denominations of 5, 10, 20, and 50, and the CC be called Bangla-Pesa. Bangla is the short form of Bangladesh and Pesa is the Kiswahili word for money.

After business group meetings as described above and several focus group sessions, the Bangladesh Business Network had its first large group meeting on February 9th 2013 with 165 local business owners attending. The agenda included plenary discussions, voucher design, question and answer sessions as well as small group demonstrations. During the demonstrations people were given 200/= of mock Bangla-Pesa (represented by coloured paper 2-5's, 3,-10's, 3,-20's 2,-50's). Each demo participant was also given white cards where their goods and services were listed along with the cost. They were instructed to buy and sell as much as possible but stay within trading limits such that: when they have less than 200 they should sell more and when they have more that 400 Bangla-Pesa they should buy more.

Based on previous meetings, five facilitators of the network were chosen, representing Community Health Workers, Youth, Elders and Men's and Women's businesses, and helped to gather the other 165 business owners for the meeting. During this meeting, attendees decided that the five facilitators should constitute an interim committee for the network. These committee members would be responsible for accounting, administration, registration, networking, care taking and organizing community service work within the network. At the launch meeting in, each business would be given vouchers representing 400 Bangla-Pesa and half of this would be retained as an annual membership fee to facilitate the five committee members with a monthly allowance and to pay for community service work. Security printing of the vouchers for businesses was set to take place in the following months and the vouchers distributed publicly at the Launch event. Videos of Complementary Currency projects in other areas were shown; including Berkshares, Brixton Pound, Bancos Palmas and Eco-Pesa.

In accordance with concerns raised in the group meetings, local business needed four guarantors in case of default before gaining admission to the network. If a BBN member spends their credits at other members and then refuses to accept a minimal level of Bangla-Pesa in their own store, the guarantors must resolve the issue, accept those credits at their own businesses, or loose membership. Similarly,

although valuing Bangla-Pesa at parity with the Kenyan Shilling is purely by consensual agreement, operationally, failing to accept BP at the determined rate would lead to suspension and eventual expulsion of the member and his/her backing group. Generally, this should be handled through pressure from buyers and sellers and a good amount of anchoring by the committee members' acceptance of the vouchers.

Following these meeting and prior to the launch event, 200 local businesses registered as interested in the program. 137 local business owners attended the launch and 56 members who had completed the registration and backing process received Bangla-Pesa. The number of members issued Bangla-Pesa grew to 109 in the following week. The definition of a business member of the program falls in line with the concept of a prosumer, someone who both produces and consumes goods and/or services locally. Anyone who could verify that they had goods and services to offer locally and could spend money locally could be a business member, such as a mother who cooks food from home. See Table 1 for more details on the types of members.

The community wanted the vouchers to be visually interesting. Therefore the Bangla-Pesa artwork was done by a local artist, Karol Opondo, Head of Art Department at The Mombasa Academy, Kenya. The computer graphics and security printing were done by Punchlines Ltd. (Kenya's top security printers based in Nairobi). Micro-lettering, specialty paper, serial numbering and UV ink are the primary means of reducing the risk of counterfeit. Bangla-Pesa vouchers are security printed in four denominations; 5, 10, 20 and 50. Since the highest denomination of Bangla-Pesa is valued at 50 Kenyan shillings and the vouchers' circulation is severely geographically limited, the incentive for counterfeiters was deemed to be minimal. The vouchers read, "Bangladesh Business Network Voucher" and in Kiswahili say "Uchumi Machinani - Tushirikiane" which translates to "Grass-roots Economy - We Work Together". Graphically the vouchers depict the labour of women and pictures symbolic to the community. Care was taken to ensure that users would understand that these are vouchers from the business network.

The morning of the launch, members of the business network processed through Bangladesh, led in song by the Bangladesh Business Network (BBN) Committee, and following a woven basket containing the Bangla-Pesa, which was escorted by local security officials. During the launch, the Alpha and Omega youth group performed a drama detailing the uses of Bangla-Pesa and addressing various community concerns. The dramas left people laughing, clapping, and better informed. Afterwards the community was briefed on some findings from the baseline data collection, helping members understand the size, seasonal and weekly fluctuations, and gender inequalities in the economy. Members also listened to speeches by the Committee Chairman Alfred Sigo and Josephat Kioko, who talked about the benefits of Eco-Pesa, the predecessor to Bangla-Pesa used in Kongowea, Kenya. Then, the proposed Bangladesh Businesses Network's constitution was read and discussed

Box 1: The Eco-Pesa Experience

Eco-Pesa was the first complementary currency system implemented in Kenya by the founders of Koru-Kenya. Lessons learned in this system provided vital guidance in designing its successor, Bangla-Pesa. According to Ruddick (2011), from 2010-2011 the Eco-Pesa program improved health and environmental conditions in Kongwea, a Kenyan slum. The Eco-Pesa system began with donor directed funding targeting environmental rehabilitation and health programs. Donor funds were held as backing for printed vouchers which were used for several donor desired activities such as waste collection. The community members who took part in the donor sponsored activities received Eco-Pesa and then used it among 75 participating community businesses. Businesses then used it amongst each other and finally redeemed a set amount each month for the original donor funds in Kenyan Shillings.

The issuance of Eco-Pesa occurred in three stages:

- 1) 75 businesses received 50 Eco-Pesa to use among themselves. These businesses were allowed to purchase more Eco-Pesa at a 20% discount and to redeem their Eco-Pesa with a 20% charge.
- 2) Eco-Pesa was issued directly to community members to pay for waste collection and tree planting services and redeemed at the same value as Kenyan Shillings from businesses. This happened at 3 major community events.
- 3) The project collected 20 tonnes of trash and planted thousands of trees, and businesses registered an estimated profit increase of 20% based on surveys with participants. The pilot program confirmed that informal settlements in Kenya would be willing to use and would benefit from a complementary currency. It also showed that health, environmental and economic issues could be addressed simultaneously and successfully through the introduction of a complementary currency.

in detail. Members of the Network asked pointed questions about issues like voting rules and tribal equity in leadership, clearly communicating their understanding and investment in the Network.

Finally, members possessing completed registration forms, with 4 co-signers and the approval of the network's committee, received 400 Bangla-Pesa and a marketing sticker for their shops. Each member returned 200 Bangla-Pesa as their registration fee. This registration fee was designated to facilitate community activities such as trash collection and health care, after an initial three month period which allows the network time to strengthen its use and understanding of Bangla-Pesa. The 400 Bangla-Pesa issued to each member was not offered as a gift or donation, but rather as a voucher for their own goods and services, which upon usage by the the member must be redeemed at their business.

Following the launch, more members completed the registration and backing process to reach a total of 109 members with Bangla-Pesa. Each member received vouchers in the following denomination: two 50's, two 5's, three 20's and three 10's. Hence the total number of individual Bangla-Pesa vouchers in the community came to 1,090. As the Bangla Pesa should be traded for goods and services

While successful in many ways, there were issues identified with the program that informed the creation of Bangla-Pesa. Namely:

- Too few businesses were involved compared to the number in community, limiting the diversity of goods and services available. Since spending opportunities were scarce, few businesses took advantage of the ability to purchase Eco-Pesa.
- There was a general lack of incentive to purchase Eco-Pesa because national currency is too valuable to give up.
- The program was donor dependent, so, once all the issued Eco-Pesa was redeemed for the donor funds, the program ended.

When designing Eco-Pesa's successor, Koru-Kenya addressed these problems in the following ways:

- A larger initial number of community businesses were involved in the inception of Bangla-Pesa.
- The community was assisted to form the Bangladesh Businesses Network in order to own the program.

The Bangla-Pesa was based on a collaborative credit system backed by members' goods and services rather than donor funds.

The issuance of Bangla-Pesa occurred in two stages:

- 1) As members are registered they receive 400 Bangla-Pesa. 200 of this is given to the community fund held by community representatives.
- 2) The Community fund is used by community representatives to pay for social service work, such as youth collecting trash

with the same value as they would with Kenyan Shillings, this constitutes 21,800 Kenyan Shillings worth of goods and service. Continuous monitoring of the program resulted in the data collected for analysis in this paper.

3 THEORETICAL BASIS

The use of collaborative credits as a tool for development rested upon two underlying assumptions. The first is that businesses in slums have excess capacity. By this we mean businesses have excess stock, some of which is perishable and goes to waste at the end of the day, as well as excess time in which they could be offering their services. The second assumption is that there is unmet demand for these goods and services because there is a scarcity of means of exchange or because existing direct barter techniques are inappropriate or ineffective. In other words, people have goods and services to offer and others desire to purchase these services, but because of poverty (in national currency), the excess capacity goods and services are not being used, and demand is not being met.

Collaborative Credits have the potential to bridge this gap by introducing a structured means of exchange that allows businesses to exchange a voucher representing their excess goods and services. Because the voucher is redeemable at

any shop in the network, it creates flexibility not present in direct barter. And, because the value of the voucher is tied to Kenyan shillings, it allows easy trade of goods at well-known and established prices. As an example, most households in Bangladesh use maize flour, vegetables, and charcoal (for cooking) every day. Imagine you are a mother of three selling peanuts, (a high-demand supplemental food in Kenya). Your stock will go bad after a certain period of time. If members of your community don't have sufficient funds to purchase peanuts, you will lose the money spent to purchase your stock, and you will not have money to purchase the goods you need. The official money supply in an informal settlement is highly volatile and unpredictable which makes it hard for businesses buying stock to know whether customers will have official money on hand, on any given day.

Now, imagine a collaborative credit is introduced into this situation. You use this voucher to purchase maize flour. This voucher is essentially a promissory note (IOU) promising to pay an amount in peanuts or other goods and services equal to the value of the flour. The person selling maize flour can then use the voucher to buy well water. The water vendor can use the voucher to buy vegetables, and the vegetable dealer can use the voucher to buy charcoal for cooking. The women selling charcoal can then return to you and exchange the voucher for the peanuts you promised to repay when you used the voucher to purchase maize flour. In this situation, excess stock that might have gone bad (maize flour, vegetables, and peanuts) and excess services that might have gone unused (well water collection) were purchased through the exchange of a voucher which represented those excess capacity goods and services.

From this, we hypothesize that the introduction of a collaborative credit should lead to an increase in sales as people exchange their excess capacity goods and services using Bangla-Pesa.

However, if there is no or insufficient excess capacity in goods and services, the Bangla-Pesa will not increase sales, rather it may simply replace the use of Kenyan shillings for some exchanges. Returning to the example above, if you as the peanut seller are able to perfectly predict market instability and purchase enough peanut stock to meet (but not exceed) the demand for your product, they you will sell all your peanuts and experience no spoilage. Similarly, if this is the case for the vegetable and flour vendors, they will experience no spoilage. And, if all the water the well is capable of producing each day is sold every day, the capacity of the well is also exhausted. In this idealized situation, there is no room for sales increases due to the introduction of an alternative means of exchange. So, the voucher would simply replace some portion of the already existing total sales, rather than facilitating trades which would not otherwise have happened (due to poverty in Kenyan shillings).

Thus, the null hypothesis is that the introduction of a collaborative credit will not lead to an increase in total sales, but rather replace some portion of sales in Kenyan shillings.

We also expect Bangla-Pesa to increase consumption, as business women and men are able to exchange their excess goods and services for items they might otherwise have been unable to purchase. In addition, the use of Bangla-Pesa should allow business owners to weather market instability more effectively, as they can exchange in Bangla-Pesa even when Kenyan shillings become especially scarce due, for example, to the outpouring of funds from the community which accompanies the payment of school fees every January. However, we focus here on sales because measuring the effect of Bangla-Pesa on stability and consumption patterns will require a longer interval between the introduction of the currency and analysis of the currency's effect.

4 RESEARCH METHODOLOGY

4.1 Baseline Survey

In order to capture the effect of Bangla-Pesa on business owners, their livelihoods, and their families, we performed a baseline survey with the 200 businesses who pre-registered for inclusion in the Bangla Business Network. These businesses are estimated to represent as much as 90% of the store-front businesses in the area. Given a prosumer definition of business it is non-trivial to identify the total number of current or potential businesses in the community. This sample is non-random, as businesses self-selected into the sample. However, this study does not seek to generalize findings to the entire business community, but rather seeks to compare the characteristics of business owner's pre- and post- introduction of Bangla-Pesa. Thus, we do not see the non-random nature of the initial survey as problematic for our analysis.

Trained community members interviewed business men and women on their business, personal, and family characteristics. The interview schedule was written in Kiswahili and the interview was conducted in Kiswahili, which is an official language of Kenya and familiar to nearly all residents. Both the interviewers and the business owners were compensated for their time according to local rates in Kenyan Shillings. Each survey was individually checked for missing or illogical data and some participants were re-contacted to resolve these inconsistencies. When these errors could not be resolved, the data was coded as missing.

4.2 Baseline Survey Variables

Appendix A. lists all variables for which the baseline collected data. For the purpose of this paper, we use data from the variables described below.

Types of businesses was measured by asking participants to identify the category or categories into which their business fell or to specify the type of business they own if it was not included in the categories given.

Daily sales were measured by asking participants to quantify their minimum, average, and maximum daily sales for

good, normal, and bad periods. For this paper, we define minimum sales as minimum sales during bad periods. We define average sales as average sales during normal periods, and we define maximum sales as maximum sales during good periods. Thus, the variables presented below represent the farthest extremes and most central experiences of business owners.

Excess capacity can be measured as the difference between the average daily sales and the maximum sales during good periods. Maximum sales in good periods represent a rough measurement of the amount of goods or services a business is capable of producing. Average sales in normal periods are a measurement of what goods and services are usually consumed. The difference between these two measures represents a business's excess capacity, the added goods and services a person could sell if there was a means of exchange present which allowed consumers to actualize their demand for products.

4.3 Survey Wave 2

During the initial week of Bangla-Pesa distribution, 105 businesses received Bangla-Pesa. 69 of these businesses pre-registered and were thus included in the baseline survey. One week after the introduction of Bangla-Pesa, surveyors initiated follow-up interviews with those 69 businesses. Of those 69 businesses, only 49 were successfully contacted and completed a survey, yielding a response rate of 71%.

Because the sample of businesses which participated in the follow-up surveys is not a random sample of those businesses who received Bangla-Pesa, we cannot be sure the results of this study accurately represent the experiences of the entire network of individuals using the vouchers. Those individuals who pre-registered to receive Bangla-Pesa and those individuals successfully contacted for a follow-up interview are likely better known to members of the committee and villages elders, because both these groups of people helped contact and pre-register individuals who might be interested in becoming part of the Bangla Business Network. This suggests participants in our sample are likely better connected to the local drivers of this project and perhaps likely to more enthusiastically use Bangla-Pesa. Thus, we might consider the results presented here, if they are not representative of the entire business network, to represent those members of the network experiencing the greatest benefit from the program.

4.4. Wave 2 Variables

The Wave 2 survey measured the following variables which we included for analysis:

- *Bangla Pesa Spent Daily* was measured by simply asking respondents how much Bangla-Pesa they used on a daily basis
- *Number of Businesses Where the Business Owners Spend Bangla Pesa* was measured by asking participants to

identify the number of businesses at which they shop with Bangla-Pesa.

- *Total amount of Bangla Pesa Spent at Businesses* was measured by adding the amount of Bangla-Pesa respondents listed after identifying where, on what, and how much Bangla-Pesa they spent at each location they frequented with the voucher.
- *Number of Bangla Pesa Customers* was measured by asking respondents to identify the number of people who spend Bangla-Pesa at their business(s).
- *Bangla Pesa Customers as a Percent of Total Customers* was measured by asking respondents to estimate the percentage of their total number of customers who use Bangla-Pesa.
- *Total Bangla Pesa Accepted from Customers* was measured by adding up the amount of Bangla-Pesa listed after identifying who, on what, and how much Bangla-Pesa customers spent at their business.
- *Minimum Bangla Pesa Received Per Day, Average Bangla Pesa Received Per Day, and Maximum Bangla Pesa Received Per Day* was measured by asking business owners to list the minimum, average, and maximum amounts of Bangla-Pesa they receive per day.
- *Current Balance of Bangla-Pesa* was measured by asking respondents how much Bangla-Pesa they currently have.

4.5 Control Group Baseline Survey

Although data for the control group survey will not be analyzed for this paper, a control community was selected and surveyed. The Bangla Business Network Committee identified another informal settlement of similar size, socioeconomic status, and business composition as Bangladesh. The control group survey perfectly mirrored the Bangladesh baseline survey except all mention of Bangladesh and the creation of a business network was removed from the survey. Interviewers followed the same procedures for data collection and compensation amounts were identical to those used in Bangladesh. In total, 209 business owners were interviewed for the control group study, making the sample size comparable to the Bangladesh baseline.

5 RESULTS

Table 1 below details; what types of businesses BBN members operate, how many businesses fall into those types, what percentage of the network those types constitute, and sales minimums, averages, and maximums for those businesses. The vast majority of business owners deal in some sort of food item, cooked, raw, or pastries. Figure 2 ranks those businesses according to their average daily sales. Shop keeping by far pulls in the most sales revenue in the

network, followed by beverages, schools, and porting. Grain

services they could sell, if demand was fully met because a



Figure 2: Average Sales by business type

milling, selling soap, and selling yeast had the least sales revenue. Overall, sales within the network range from an average 310 Kenyan shillings per day to an average 1600 Kenyan shillings per day, or approximately 3-15 Euros per day in sales (not profits). This suggests a high degree of volatility in the network economy, as sales in good periods are more than triple sales in bad periods. Although not measured in this study, the presence of Bangla-Pesa in the community may also reduce this volatility as people have access to a means of exchange even in times of market instability and can continue to make sales using that currency. The last column in Table 1. subtracts the average daily sales from the maximum daily sales: this represents the value of their excess capacity, the amount of goods and

means of exchange was present. On average businesses have, 1,039.26 ksh worth of excess capacity. This means that in an idealized situation, given sufficient means of exchange, businesses in the network could be doing around 9 Euros of trade more per day. Should business owners, in an ideal situation, be able to sell all of this excess capacity, they would increase their sales by 144%.

6.2 Bangla-Pesa Usage

Of the 49 businesses interviewed for the follow-up survey, 12 had not yet begun to use their Bangla-Pesa. The descriptive statistics below (Table 2) detail usage rates amongst those who were spending and accepting Bangla-Pesa.

Table 1. Businesses Types, Sales, and Excess Capacity in the Bangla Business Network

Business Type	Freq	Percent	Min Sales	Avg Sales	Max Sales	Excess capacity
Cooked Food	65	28.89	373.93	796.35	1,343.1	546.75
Raw food	46	20.44	337.82	865.26	1,530.79	665.53
Pastries	36	16	356.06	780	137.88	607.88
Shop Keeping	25	11.11	1,120.48	2,576.19	6,911.91	4,335.72
Charcoal	25	11.11	348.1	694.55	152.43	826.88

Business Type	Freq	Percent	Min Sales	Avg Sales	Max Sales	Excess capacity
Salon	22	9.78	315.79	560.18	1,688.1	1,127.92
Clothes & Shoes	15	6.67	240.77	886.36	1,666.67	780.31
Water	11	4.89	338.89	695.45	1,622.22	926.77
Sewing	11	4.89	361.11	438	1,061.11	623.11
Porting	11	4.89	381.82	1,036.36	2,318.18	1,281.82
Construction	10	4.44	342.86	612.5	1,514.29	901.79
Carpentry	7	3.11	470	471.43	1,480	1,008.57
Media and Electronics	5	2.22	580	987.5	1,700	712.5
Beverages	4	1.78	650	1,412.5	2,500	1,087.5
Transportation	3	1.33	385	2,066.67	2,066.67	1,616.67
Photocopy	3	1.33	133.33	800	800	483.33
Health	3	1.33	200	500	500	-
Soap	2	0.89	60	200	200	80
Lamp Oil	2	0.89	150	650	650	300
Ironing	2	0.89	75	4,250	4,250	3,700
Cybercafe	2	0.89	175	400	400	-
Yeast	1	0.44	30	250	250	190
School	1	0.44	400	2,500	2,500	1,200
Grain Mill	1	0.44	80	1,000	1,000	800
Photo Studio	1	0.44	50	250	250	-
Farming	1	0.44	100	400	500	100
Airtime	1	0.44	-	-	-	-
Network Average	-	-	309.84	719.97	1,600.48	1,039.26

Notes on table

Because some network members identified owning more than one type of business the frequency will not sum to 225 (the current number of network members) and percentages will not sum to 100.

Sales and excess capacity data are reported in Kenyan Shillings

Dash indicates that either missing or incomplete data prevented accurate calculation of the variables.

Table 2. Bangla-Pesa Usage Statistics

Variable	Sample	Mean	Std. Dev	Min	Max
BP Spent Daily	37	69.39	49.09	12.5	200
No. of businesses where BP spent	37	4.27	1.88	1	10
Total BP spent at those businesses	37	132.30	93.12	30	345
No. of BP customers	37	3.84	1.74	0	10
BP customers as % of total customers	35	62.14	37.57	0	100
Total BP accepted from customers	34	140.62	103.67	5	450
Miniumum BP recieved per day	37	48.45	41.55	0	200
Average BP recieved per day	36	65.00	45.81	0	200
Maximum BP recieved per day	36	92.58	61.35	0	200
Current balance of BP	28	148.04	103.41	0	500

Table 3. Perceived Changes in Sales

Variable	Increased		Stayed the same		Decreased	
	Frequency	Percent	Frequency	Percent	Frequency	Percent
Total Sales	30	83.33	4	11.11	2	5.56
Bangla Pesa Sales	19	52.78	12	33.33	5	13.89
Kenyan Shilling Sales	24	68.57	7	20.00	4	11.43

On average, business owners reported using around 70 Bangla-Pesa a day at four other member businesses. As stated, 12 members reported not yet using the Bangla-Pesa. If we assume these usage rates are the same for all 109 individuals using Bangla-Pesa, 82 people were likely actively using Bangla-Pesa for a total daily exchange of 5,740 Bangla-Pesa.

Business owners also reported receiving 65 Bangla-Pesa a day at their businesses from around 4 customers. This suggests businesses were both spending and receiving Bangla-Pesa at a similar rate and from a similar number of individuals. And, in fact, they tended to be both buying and selling goods from a very nearly the same group of 4 businesses. Each trade was for items valued at between 5-170 Ksh, with an average of 34 Ksh.

5.3 Sales Changes

As shown in Table 3, the vast majority of people using the Bangla-Pesa felt that their business was benefiting from the

vouchers. 83% reported that their total sales were increasing, and only 2 people reported decreases in sales.

Returning to the hypotheses detailed above, we expected the introduction of Bangla-Pesa to increase sales as businesses were able to use the vouchers to exchange their excess capacity. Based on perceptions of individuals within the network, this appears to be the case, given that 83% of respondents within our sample reported sales increases. Further, our null hypothesis was that Bangla-Pesa would simply replace sales in Kenyan shillings, rather than result in increased sales due to the trading of excess capacity. If this were true, we would expect to see a drop in sales in Kenyan shillings. Only 4 people registered such a reduction specifically in Kenyan Shillings. This suggests that for the other 89% of the network, at least, Bangla-Pesa exchanges did not replace trades in Kenyan shillings but represent separate, additional transactions.

Although we did not numerically measure sales increases, we can estimate how much sales may have increased using the baseline survey data. Average daily sales in Bangla-Pesa

represent 22% of the average daily sales in Kenyan Shillings reported by businesses in the baseline survey. At the very least, then, businesses were doing around 22% of their trades in Bangla-Pesa. However, this number remained the same for those businesses who reported that their sales in Kenyan shillings had remained stable. This suggests the 22% of daily trades done with Bangla-Pesa represent additional sales which might not have happened without this means of exchange (at least for those people whose sales in Kenyan shillings remained the same). And, since most people reported an increase in total sales, it seems likely they are experiencing a similar increase in sales due to the use of Bangla-Pesa. Given that we estimate businesses have an excess capacity which represents 144%

of their average sales, just one week of Bangla-Pesa usage may have helped businesses owners achieve 15% of this potential increase.

6. DISCUSSION

The rapid evaluation of the programme just one week after introduction of the voucher provides a snap shot of its potential. Should the program continue, given the 22% of daily trade in Bangla-Pesa in the community evidenced in our results, we expect to see members of the network spending less Kenyan Shillings on their basic needs (in local goods and services). These Kenyan Shillings that have been "freed" can then be redirected to increasing living standards through the purchase of more nutritious food, for example, or for business investments, like buying additional stock from outside the community. Hence, we would expect to see an equivalent rise in the amount of Kenyan Shillings in the Network overall. Our baseline data showed that, during good periods, trade was at least twice to three times as much as in normal periods. Should the trade in Bangla-Pesa seen in the first week of circulation continue, we would expect the raise in overall sales to continue toward an optimal point at which all excess capacity in the community is utilized. We would also expect to see less variability, hence more stability in sales weekly and seasonally. Finally, should membership fees in Bangla-Pesa be used for community service work, we expect to see increased community cohesion and living standards. This is due to more collective community work being done for the benefit of the community as a whole.

Systems like the Bangla-Pesa also offer sustainable development solutions with rapid and quantifiable social returns on investment. Based on our initial results, this 22% increase in network trade would result in roughly 4.500 Euros of new trade in the community after three months. This is more than the entire 4.000 EUR cost of implementation, materials, materials development and research.

National and international oversight to ensure standards in implementation and issuance is important to prevent over issuance. The amount of Bangla-Pesa issued to the businesses was decided after in depth discussions and analysis of the local economy. Project implementers deemed that 200 Bangla-Pesa per member was an adequate starting

amount to facilitate local exchanges without interfering with members' ability to purchase stock and other items outside the community.

In the field of community banking and national CC policies, the organization, Strohalm, in the Netherlands has spear-headed work with Bancos Palmas and other programs centred in South America. Authors such as Freire (2009) offer detailed analyses of Strohalm's CC systems and their accompanying legal frameworks in Brazil over the last decade. Lietaer (2004) offers a compelling analysis of the diverse CCs of Japan and why some have succeeded and others have failed. While these forerunners have helped set precedent for CCs around the world, there is still much to be done to establish these programs in countries like Kenya.

While the Eco-Pesa program ran for a year with no legal challenge in Kenya, an article by a local newspaper in May 2013 claimed that Bangla-Pesa was a secessionist plot and that the community was no longer using Kenyan Shillings (King 2013). This resulted in 6 people placed in jail, including one of the authors, William O. Ruddick. The 6 faced charges of forgery by the Central Bank of Kenya but were eventually cleared of all charges in August 2013, when the Kenyan's Director of Public Prosecution found that no laws had been broken. The program was re-launched with the support of the local government in November 2013 and, as of August 2014 has over 200 businesses, including schools, clinics and churches, using Bangla-Pesa daily. Also with the support of the local government, the Bangla-Pesa program was fully incorporated into the constitution of the Bangladesh Business Network which is a legally registered Community Based Organization.

Mobile phone trading systems offer an alternative to such legal challenges, with additional beneficial properties. Thus, in time, business issued vouchers will not need to be printed. Mobile phone money transfer has been pioneered in Kenya via Safaricom's M-PESA system, which nearly 70% of the population uses (Hughes 2007). However, these systems are not feasible currently because the tariffs are too large for the small amounts of Bangla-Pesa used for each transaction. For small transaction, below 100 Ksh, M-PESA can charge more than 20% per transaction according to current tariffs (Saficom 2013). So, customers use the system for transferring sums large enough to warrant this expense. We continue to explore options regarding the use of electronic complementary currencies, as such a system would allow for nearly perfect, comprehensive, real-time data collection, as well as reducing the other costs and inconvenience related to printing and wear and tear of physical vouchers. We believe such a system would be well received by communities like Bangladesh and represents a viable option for future projects, if transaction costs can be minimized or eliminated.

7. CONCLUSIONS

While complementary currencies like Eco-Pesa offer a multiplier effect to existing aid programs, collaborative credit

programs like Bangla-Pesa, created and backed by local business networks, could represent a self-determined form sustainable development. After only a week of circulation, Bangla-Pesa helped community members tap into an estimated 22% increase in their sales through capacity trading. This is a substantial increase for a community of people living in poverty. With an implementation time of 6 months and implementation cost of roughly 4.000 Euros, these systems appear to represent viable and cost effective sustainable development tools.

A network of micro-enterprises coming together to co-own and create their own collaborative credit could be considered the next step in cooperatives and micro-finance, which can transform the economies of people living in poverty. The positive results in a short time suggest collaborative credits like Bangla-Pesa are promising sustainable development solutions in poverty stricken areas. However, we see an immediate need for both further and more sustained research and international support to promote legislation and understanding amongst policy makers and regulators to avoid future programme disruptions due to confusion and lack of regulation.

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APPENDIX 1

Variables from Baseline study

Business characteristics

- Legal status of businesses
- Type(s) of business(es)
- Items/services offered
- Minimum, average, maximum daily sales during ordinary, good, and bad periods
- Numbers of customers on weekdays, Fridays, and weekends during ordinary, good, and bad periods
- Proportion of customers from Bangladesh
- Good and bad days, weeks, and months
- Reasons for good and bad periods
- Use of business logbooks, registers, and receipts
- Cash on hand and savings
- Use of Banks, Micro-finance, saccos, and Merry-Go-Rounds for savings and/or investment
- Employees and salaries/payment mechanisms

Personal and family characteristics

- Age
- Gender
- Birthplace
- Education
- Languages and literacy
- Household headship
- Family composition
- Relationship status
- Hours spent on housework daily
- Use of cell phones, m-pesa, and the Internet
- Involvement in community activities
- Money given to and received from family
- Spending habits