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Case Study

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**Case Study on the Use of Smartcards to  
Deliver Government Benefits in Andhra  
Pradesh, India**

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## **Executive Summary**

Since late 2007, Indian technology company Financial Information Networks and Operations (FINO), in collaboration with the state government of Andhra Pradesh and several partner banks, has delivered payments from two separate government programs (the National Rural Employment Guarantee Act (NREGA) and Social Security Pensions (SSP)) to beneficiaries using a platform based on smartcards and mobile smartcard readers. In this report, we describe the smartcard payment system and analyse its impact on the beneficiaries of the programs and the efficiency of program delivery.

Our analysis reveals that, the smartcard payment system has resulted in greater convenience and empowerment for beneficiaries and reduced fraud at the back end. With the smartcard payment scheme, beneficiaries spend fewer days waiting for payments to become available and less time waiting in line at transaction points for their payments to be processed. In addition, anecdotal evidence suggests that the use of smartcards, by ensuring that payments to female beneficiaries are delivered to the beneficiaries themselves and not their husbands or brothers, has resulted in increased women's empowerment. Further, we uncover limited evidence that the smartcard system has reduced levels of fraud in NREGA and SSP by a) identifying fictitious beneficiaries during the enrolment stage and b) by making it more difficult for NREGA supervisors to over-report work done.

In the last half of this report, we describe FINO's plans to offer savings accounts to beneficiaries using the smartcards and investigate the potential for other additional financial services or government benefits to be delivered as well. Due to the current extremely low levels of access to savings products by NREGA workers and SSP pensioners, we predict that the addition of savings products is likely to have significant impact on the financial inclusion of beneficiaries. However, we find no other suitable services which could relatively easily be delivered via the existing payment system.

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# 1. Introduction

Governments around the world are increasingly experimenting with innovative solutions to deliver payments to beneficiaries of public programs (Bankable Frontier Associates, 2006). One such solution which has achieved prominence in recent years is the use of biometric-enabled smartcards and smartcard readers. In Germany, smart cards are now used for tracking individual claims and storing medical information for all 71 million legal customers of health insurance in the country.<sup>1</sup> In Malaysia, the government has gone one step further by rolling out a national smartcard ID which simultaneously serves as a driver's license, ATM card, credit card, and repository of sensitive medical information.<sup>2</sup> China has unveiled similar plans to introduce a national smartcard ID for all its citizens.<sup>3</sup>

In India, while delivery of government benefits via smartcards remains limited, the central government has repeatedly voiced its support in principle for the use of smartcards in implementing public programs. In 2007, the Planning Commission, a semi-independent government agency which controls nearly \$20 billion in funds for poverty alleviation programs (Subramanian, 2008), released a white paper in which it outlined a vision for creating a nationwide ID system based on smartcards which would be used to deliver all major government programs. (Planning Commission, 2007) Also in 2007, the central government announced its intention to launch a major new health insurance scheme for poor households (Rashtriya Swasthya Bima Yojana or RSBY) which would be implemented entirely through smartcards and smartcard readers located in hospitals. More recently, in a speech presenting the 2008-2009 Union Budget, Finance Minister P. Chidambaram announced initiatives to deliver benefits under the government program to provide subsidized basic foods and fuels (the public distribution scheme) using smart cards in the state of Haryana and the union territory of Chandigarh.

Payment delivery systems based on smartcards and mobile smartcard readers offer several advantages over those based on other more traditional forms of identification. First, smartcards offer exceptionally strong security. It is virtually impossible to copy a card or manipulate card data except through the use of a legitimate smartcard reader. In addition to preventing counterfeit cards, this enhanced security also allows providers to store data on the card itself safe from tampering by the card holder or from being read by malicious third parties (or even other providers<sup>4</sup>). This feature is particularly useful if the cards are used for the delivery of savings accounts or health insurance in areas with limited connectivity.<sup>5</sup>

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<sup>1</sup> [http://www.smartcardalliance.org/resources/pdf/German\\_Health\\_Card.pdf](http://www.smartcardalliance.org/resources/pdf/German_Health_Card.pdf)

<sup>2</sup> [http://www.unisys.com/public\\_sector/clients/featured\\_case\\_studies/malaysia\\_smart\\_card\\_.htm](http://www.unisys.com/public_sector/clients/featured_case_studies/malaysia_smart_card_.htm)

<sup>3</sup> <http://www.zdnet.com.au/news/security/soa/China-reveals-massive-smart-ID-card-plan/0,130061744,120277217,00.htm>

<sup>4</sup> Most smartcards produced today allow several different providers to securely store information on a single card with each provider's information secure from access by the others.

<sup>5</sup> In the case of savings accounts, the account balance may be stored on the card itself thus allowing the service provider to conduct transactions on the savings accounts even if the smartcard reader is not connected to a back end server. In the case of health insurance, sensitive health details can be stored on the card.



Second, because smartcards can only be used if the cardholder's biometric data matches that on the card itself, smartcards ensure that the intended beneficiaries are physically present at the time transactions are processed.<sup>6</sup> Confirming beneficiaries' presence at the time of transaction not only helps prevent identity theft but may also greatly reduce certain forms of fraud. Third, the mere act of collecting beneficiaries' biometric information, a necessary preliminary step before smartcards may be issued, may result in reduced fraud as fictitious or duplicate beneficiaries are weeded out of the system.<sup>7</sup>

Setting up a system of smartcards and smartcard readers to deliver government payments may have important indirect benefits as well. First, if participation in the program is sufficiently high, the smartcard may become a de facto ID used for purposes other than the government program for which it was originally distributed. Second, the network of agents and smartcard readers established to process the government benefits may be leveraged to provide financial products to beneficiaries and others living near the payment processing points. As agents and smartcard readers are often based in locations beyond the reach of the formal banking system, the potential impact on financial inclusion of offering financial products via this channel is substantial (Bankable Frontier Associates, 2006). Whether this potential benefit is realized, however, depends crucially on whether local banking regulation permits agents recruited for processing payments of government benefits to process transactions on behalf of banks as well.

In 2007, Indian technology company FINO, in collaboration with the state government of Andhra Pradesh and several partner banks, launched a project to deliver payments from two large government programs – the National Rural Employment Guarantee Scheme and the Social Securities Pensions Scheme – via a system of smartcards held by end beneficiaries and agents equipped with smartcard readers located in villages. The FINO scheme represents the first large scale use of smartcards for the delivery of government services in India's history. In this report we first describe the smartcard payment system, detailing the beneficiaries' experience and the back end processes related to data management and cash handling performed by FINO. Second, using data collected through surveys of beneficiaries, interviews with FINO staff and government officials and several other sources, we evaluate the impact of the payment system on the beneficiary in terms of convenience, susceptibility to "skimming" by those responsible for disbursing benefits, beneficiary empowerment, and financial literacy. Third, we estimate the impact of the introduction of the payment system on overall program efficiency. Lastly, we investigate the potential for the existing smartcard system to be leveraged to deliver additional government benefits or financial products and probe whether the smartcards themselves are really necessary for the functioning of the payment scheme.

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<sup>6</sup> A minor point, which we will return to at the end of this report, is that biometric authentication can also be achieved by storing beneficiaries' fingerprints or other information on a mobile transaction device itself rather than the smartcard. Performing biometric authentication using data stored on a mobile transaction device is more restrictive though as the beneficiary must always receive payments from the same mobile transaction device.

<sup>7</sup> Again, this advantage does not directly result from smartcards themselves but rather the act of collecting biometric data of all officially registered beneficiaries and searching for duplicates among these beneficiaries. This step is obviously necessary in order for smartcards to be distributed but can also be performed without the actual distribution of any smartcards.



## 2. Payment Systems for Government Benefits – Concepts

Definitions of several basic concepts related to the disbursement of government benefits utilized in this report are provided below.<sup>8</sup>

### 2.1. Types of Payment Systems

Payment systems for disbursement of government benefits can be broadly classified into two groups: “**pull**” and “**push**”.

- A “**pull**” payment system requires the beneficiary to travel to a specified location at a specified time to receive his or her payment. In a pull payment system, beneficiaries are required to collect the full amount of their payment at the time of transaction processing.
- In a “**push**” payment system, cash is credited to beneficiaries’ bank accounts. Beneficiaries then access their payments at any time via the existing formal financial system. Typically, beneficiaries may withdraw only a portion of their payment at a time, leaving the rest to be withdrawn later.

In practice, a payment system may blur the lines between “push” and “pull.” For example, a payment system may require that a beneficiary travel to a specific location at a certain time to receive payment but may allow the flexibility of only withdrawing a portion of the payment each time.

Due to the limited reach of the formal banking sector in many developing countries (including India), payment systems in these countries typically rely on “pull” approaches.

### 2.2. Additional Services


Often, the payment system for a government program will be leveraged to offer financial services to beneficiaries. There are two main ways in which financial services can be offered via the payment channel: “**add-in**” and “**add-on**”. According to Bankable Frontier Associates (2008):

- “**Add on**” services are opportunities for allocating some portion of the grant funds into a formal ‘account’ for a purpose other than immediate consumption., e.g. saving a portion of the grant

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<sup>8</sup> The discussion in this section follows Bankable Frontier Associates (2006).





monies for some anticipated (emergency or scheduled) need, securing credit for investment, or purchasing some type of insurance. These services may be offered directly by the grant agency or preferably (because of inherent capability) by direct linkage to a formal financial services provider.

- “**Add in**’ services build on the existing connection between a recipient and a financial institution that is inherent in the push approach. That financial institution may offer additional products/services beyond the initial transaction account. Often this will require new or unique products tailored to the small balance, low transaction volume typical of G2P program recipients.”


## 2.3. Beneficiaries and Recipients

Often, the person who physically receives the payment for a government program is not the same as the person listed as receiving the payment in government records. The most common example of this is when a parent receives payment on behalf of a child.

We define the person targeted for the government program as the “**beneficiary**” and the person who actually receives the cash as the “**recipient**”. In the government programs discussed here, this distinction is rarely relevant – the person listed as receiving the payment is almost always the same as the person who actually receives the payment – and thus we use the term “beneficiary” throughout. The one exception to this rule is in the case of payments to female beneficiaries made via traditional payment methods where husbands or brothers may occasionally receive the payments on their behalf. (See section “Empowerment of Female Beneficiaries” for more information.)

## 3. Methodology

In order to gain a diversity of perspectives on the functioning and impact of the smartcard payment scheme, the research team employed several distinct data collection strategies. First, structured interviews were conducted with ten beneficiaries from several villages spread throughout the district of Karimnagar, the district in which FINO first began operations. Respondents were individually selected in order to ensure diversity in terms of caste group, location, income, and levels of participation in the government programs. Each interview lasted around two hours during which respondents were asked a series of questions from a relating to their experience in receiving benefits, level of financial inclusion, and yearly income cycle. (See **Appendix A** for the exact list of questions asked individual respondents.) While care was taken to ensure that the sample of beneficiaries exhibited wide diversity, it should be noted that due to time constraints, the sample of beneficiaries selected for interviews was neither random nor large



enough to be considered representative of the population at large. In several cases, structured interviews were followed up with unstructured focus group sessions with several NREGA workers in the village.

Second, unstructured interviews were conducted with three FINO agents responsible for disbursing payments, several FINO staff responsible for the operation of the payment system, bankers, and government officials in Karimnagar district.

Third, the research team attended a public hearing in which results from an audit of NREGA in Thimmapur sub-district of Karimnagar were released and complaints from the public about the functioning of NREGA were heard. As these public hearings provide a unique opportunity for beneficiaries to make their concerns about NREGA heard by top district officials, they provide invaluable information about levels of leakage and corruption in the NREGA program. In the case of the Thimmapur sub-district audit hearing, the proceedings proved especially useful as FINO is responsible for disbursing NREGA wages and SSP pensions in the vast majority of villages in this area.

Fourth, the research team interviewed several high level experts in various fields, from CEOs of technology companies involved in the development of smartcard technology to RBI officials to managers of grassroots organisations with years of experience using smartcards for financial inclusion.<sup>9</sup>

## **4. Overview of Government Benefits Delivered via the Smartcards**

### **4.1. The National Rural Employment Guarantee Act (NREGA)**

The National Rural Employment Guarantee Act, passed by the United Progressive Alliance (UPA) government in 2005, is one of the largest and most ambitious anti-poverty schemes adopted by the central government since independence. The act provides a legal guarantee of 100 days of work a year at a minimum wage to all households in India willing to perform unskilled manual labour. According to the act, any household seeking work must be provided employment within 15 days or else be paid a daily unemployment allowance until work is found. To ensure that the output of NREGA labour directly benefits local communities the act stipulates that all NREGA projects be selected and supervised by locally elected leaders. (For more information on NREGA see **Appendix B**.)

Despite the legal requirement that all households be provided up to 100 days of work, to date, demand for NREGA work has far outstripped supply in most areas of the country.

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<sup>9</sup> As several of the people interviewed expressed a desire to remain anonymous, we have abstained from listing the people interviewed here but wish to express thanks to all those who provided information for this report.



**A typical NREGA worksite near Nalagonda village in Karimnagar, Andhra Pradesh. The ditches (known as “minor irrigation tanks”) help replenish the local water table by storing water from the monsoon that would otherwise runoff into rivers.**

#### **4.1.1. Anomalies in the Implementation of NREGA in Andhra Pradesh**

It is important to point out that the implementation of NREGA in Andhra Pradesh differs fundamentally from that of other states in two key ways. First, Andhra Pradesh is the only state to have successfully established an independent government agency to conduct audits of the functioning of NREGA. (Several other states encourage independent organisations to conduct audits of NREGA worksites but, to the author’s knowledge, no other state has established an independent agency solely for the purpose of conducting NREGA audits.) Second, Andhra Pradesh is the only state to have implemented an advanced information system for tracking worksite data. The information system, designed and built by Tata Consultancy Services, allows muster roll details entered at each sub-district to be shared seamlessly with district and state offices. In addition to reducing paperwork the system also greatly increases transparency: all muster rolls for all worksites in the state are made available with a small time lag on the Andhra Pradesh NREGA website.<sup>10</sup> (For more information on the implementation of NREGA in AP see **Appendix C.**)

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<sup>10</sup> To view muster rolls and other information on the implementation of NREGA in the state of Andhra Pradesh, visit [http://nrega.ap.gov.in/Nregs/Home\\_eng.jsp](http://nrega.ap.gov.in/Nregs/Home_eng.jsp)

As we describe later, anecdotal evidence gathered for this report as well as the commentaries of independent observers<sup>11</sup> suggest that this combination of independent audits and a transparent information system has been very successful in ensuring low levels of corruption and malfeasance. Specifically, we found that the incidence of “skimming” of wages by post office employees was virtually unheard in Karimnagar district despite the widespread perception that this is a problem throughout India.

Any attempt to generalize from the Andhra Pradesh experience in using smartcards to disburse NREGA and SSP should take these differences into account. It may be the case that the benefits of the payment system would be even greater in a state with higher pre-existing levels of corruption since one of the key potential benefits of the smartcards is that they may reduce corruption. On the other hand, it may be precisely the high levels of local government capacity in Andhra Pradesh which has allowed the payment scheme to be successful in the first place in AP.




**A public hearing in which results of an audit of NREGA in Thimmapur sub-district in Karimnagar district were released.**

## **4.2. Social Security Pensions (SSP)**

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<sup>11</sup> See, for example, <http://www.hinduonnet.com/2008/09/08/stories/2008090856271000.htm>



The Andhra Pradesh social security pensions program (SSP) comprises four separate government anti-poverty programs: an old age pension, a relief payment for those with a physical handicap, a relief payment for those with a mental handicap, and a relief payment for widows.

According to the law, anyone belonging to a household classified as “below poverty line”<sup>12</sup> by the government and over 65, a widow, physically handicapped, or mentally handicapped is eligible to receive an SSP pension. In practice only a limited number of pensions of each type, usually far below the actual number of people eligible for the program, are allotted to each Gram Panchayat<sup>13</sup>. Gram Panchayat leaders must then ration these limited pensions among all those eligible.

In Andhra Pradesh, each of these pensions entails a monthly benefit of 200 rupees (\$4.34)<sup>14</sup> which is delivered to the beneficiary at the beginning of each month.

Due to the relatively small proportion of SSP pensioners in the overall pool of beneficiaries (NREGA wage workers outnumber SSP pensioners over 6 to 1 in FINO villages) and the comparative simplicity of delivering SSP payments (as no information must be gathered on a regular basis and amounts never change), this report focuses more on the disbursement of NREGA wages than SSP pensions.

### **4.3. Existing Payment Methods for NREGA and SSP**

In addition to delivery via smartcards, the government of Andhra Pradesh delivers NREGA wages and SSP pensions via three other methods: post office savings accounts, bank accounts, and village officers / Gram Panchayat officials. All of these methods (as well as the smartcard system described later) are based on a “pull” approach to payments.

Out of these three methods, the most commonly used is post office savings accounts. Due to the extensive reach of the post office network<sup>15</sup>, disbursement via post office savings accounts is very convenient for beneficiaries but has been criticized as a payment mechanism because of a perceived susceptibility to leakage.

In part out of concern for these issues, the central government recently mandated that all NREGA wages be routed via individual bank accounts in the future. However, while delivery of payments via bank accounts offers increased transparency, it suffers from the drawback that beneficiaries often must travel long distances to receive their benefits. For these reasons, as well as resistance from banks themselves, post office savings accounts continue to be used to disburse both NREGA wages and SSP pensions in many villages throughout Andhra Pradesh despite the central government order.


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<sup>12</sup> All households in India are classified as either “above poverty line” or “below poverty line” according to a set of criteria developed by the government. Households classified as “below poverty line” (BPL) are entitled to government benefits such as subsidized food and fuel.

<sup>13</sup> “Gram Panchayats” are locally elected village councils. For an overview of the panchayati raj system see Chattopadhyay and Duflo (2004).

<sup>14</sup> The exchange rate for rupees to dollars is 46 rupees to the dollar at the time of publication of the report.

<sup>15</sup> There are over 150,000 post office branches in India though it should be noted that many rural branches are staffed by only a single part time employee.



In villages where there is no post office or bank branch within a reasonable distance, NREGA wages and SSP pensions are processed manually by “village officers”<sup>16</sup> or Gram Panchayat officials. Due to the political power of village officers and Gram Panchayat officials, this mechanism is perceived as being highly susceptible to corruption and is generally avoided if other options are available.

Regardless of the method used, the NREG Act requires that wage payments must be made within 15 days of the completion of work.

## **5. Overview of the Smartcard Payment Scheme**

### **5.1. Introduction**

In August 2007, FINO, in collaboration with the government of Andhra Pradesh, launched a pilot to disburse NREGA wages and SSP pensions via smartcards and a network of agents equipped with mobile card readers in Sisilla and Thimmapur sub-districts of Karimnagar district. In January 2008, the pilot was scaled up to six districts across the state. (See **Appendix D** for a map of Andhra Pradesh showing which districts FINO is operating in.) In the remainder of this report, we describe this new system for delivering NREGA wages and SSP payments, analyse its impact, and discuss the potential for the existing system to be leveraged to deliver additional financial services and/or government benefits.

### **5.2. Beneficiary Enrolment**

Before establishing operations in a village, FINO first gathers all ten fingerprints, a photo, the signature, and other details of each potential beneficiary so that smartcards can be created and bank accounts can be opened in the name of each beneficiary, a process known as “enrolment.”<sup>17</sup> Enrolment is performed by teams of two contractors who gather client details using a laptop with an attached fingerprint reader, digital camera, and signature reader.<sup>18</sup>

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<sup>16</sup> The term “village officers” refers to locally elected leaders of Velugu, the state-sponsored microfinance program. Village officers are responsible for depositing and withdrawing cash in banks on behalf of SHGs and often aid in the management of local cooperatives. Due to the extremely high levels of participation in the microfinance program (according to the Government of Andhra Pradesh (2005), by March, 2005, the Velugu program covered 92% of poor households in the state) village officers often wield significant power in their local communities.

<sup>17</sup> RBI regulations stipulate that banks must gather certain information, known as “know your customer” information, from each prospective account holder. As all funds disbursed via the smartcard payment system are technically routed via individual bank accounts, these requirements must be fulfilled for each and every beneficiary.

<sup>18</sup> In rare cases where there is no reliable source of electricity in the village or nearby, enrolment teams must also carry a portable generator.



One or two days before the enrolment team arrives at a village, Gram Panchayat officials alert local NREGA workers and SSP pensioners through a “tomka” – a traditional method of spreading important news in villages in which an official walks through the streets banging a drum and announcing the news. The actual process of enrolment itself is straightforward and takes about five minutes per beneficiary. First, a FINO contractor searches for the beneficiary in the list of beneficiaries provided by the local sub-district office. Once the contractor finds a match, he verifies the individual’s identify based on the person’s NREGA job card or SSP card. Next, the contractor takes the individual’s photo, gathers all ten fingerprints<sup>19</sup>, and records the individual’s signature. Finally, the beneficiary is passed off to the second FINO contractor who gathers some additional information and fills out a bank account opening form for the individual.

At the end of the day, the enrolment team burns all the data gathered on a CD which is sent, by way of the local district office, to the FINO head office in Mumbai. Upon receipt of the CD, FINO technicians in Mumbai upload the data to a central server and perform a check against all new fingerprints which are gathered, or “de-dupe”, to ensure that no two enrolled beneficiaries are in fact the same person.

A team of two contractors can enrol a maximum of about 150 beneficiaries per day and fully complete enrolment for an average size village (around 750 beneficiaries), in about five days. In the instance that a beneficiary misses the initial enrolment for some reason, he or she must travel to the local sub-district office to be enrolled.



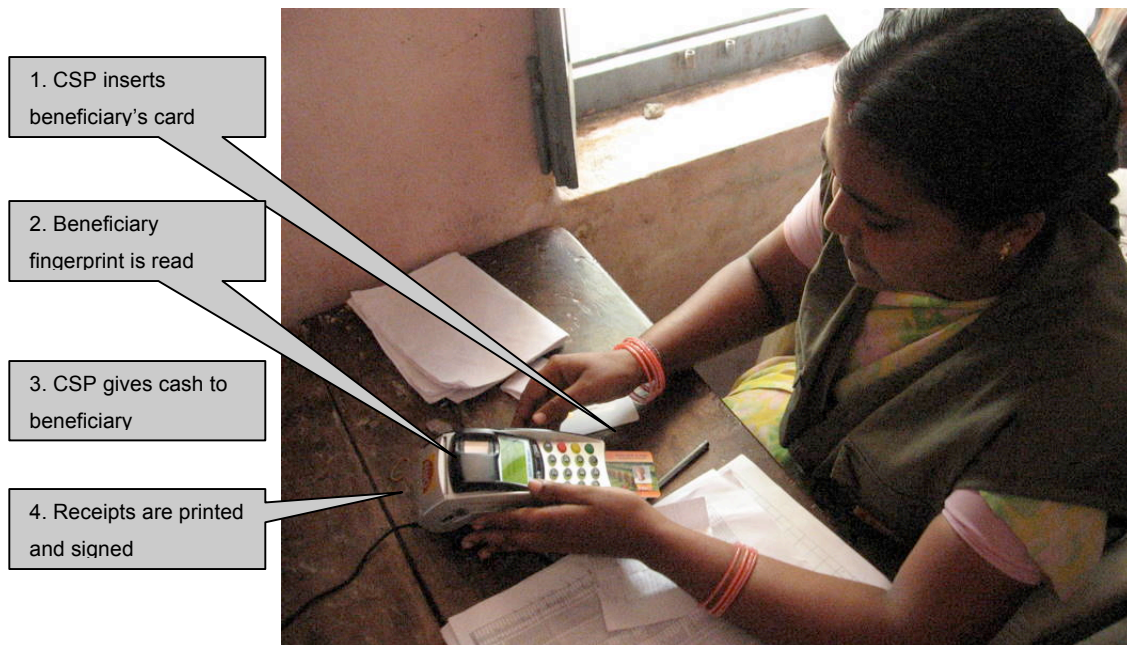
**Contractor collects details of a beneficiary in Karimnagar using a specialized**

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<sup>19</sup> All ten fingerprints must be collected because the fingerprints of rural labourers are often worn so thin that a single fingerprint may be insufficient for matching purposes.

### 5.3. Front End: The Beneficiary's Experience

From the beneficiary's perspective, the process of receiving NREGA wages or SSP pensions via a smartcard is simple and, superficially, similar to receiving payments via a post office savings account. Each Thursday or Friday, the beneficiary travels to the local Gram Panchayat office with his or her smartcard where a trained agent, or "customer service provider" (CSP), equipped with a FINO-designed point of transaction (POT) device awaits the beneficiary. The CSP swipes the beneficiary's smartcard, takes the beneficiary's fingerprints using the built-in fingerprint reader to confirm his or her identity, and then gives the beneficiary the amount listed on the POT screen. After the transaction is complete, the POT device automatically prints two receipts for the transaction, one of which is signed by the CSP and given to the beneficiary and the other of which is stored by the CSP. The entire transaction takes around one minute to perform.



### 5.4. Back End: Cash Handling and Data Management

At the back end FINO must coordinate among a number of different actors and execute a variety of tasks in order to process payments each week. The diagram below illustrates the weekly cycle of cash



handling and data management performed by the government officials, FINO staff, and CSPs in order to process payments. Notes on each of the steps are provided below.

Figure 1: Weekly Backend Processes for Disbursing Payments

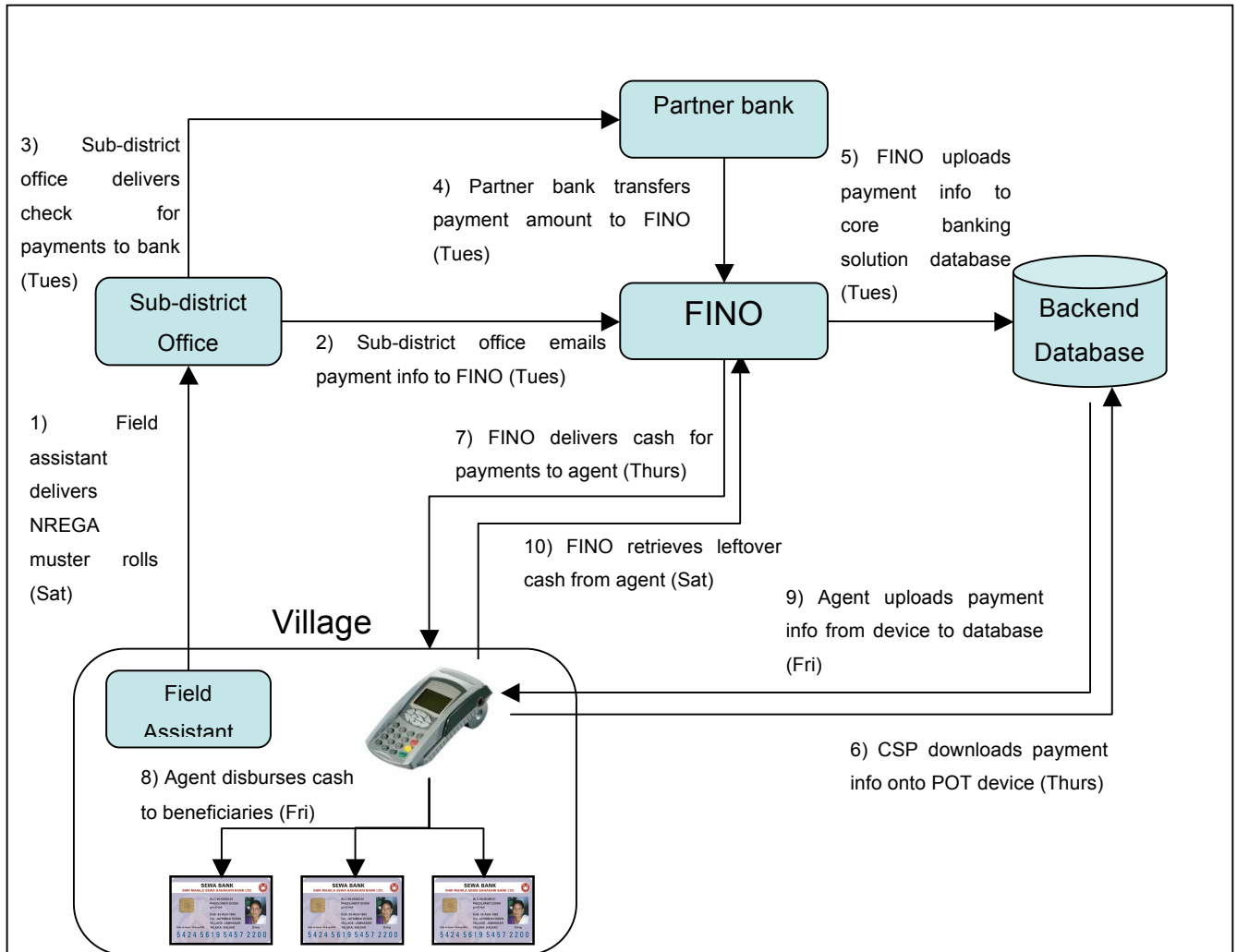


Table 1: Backend Steps Involved in Disbursing Payments

#	Step	Day	Notes
1	Field assistant delivers muster rolls to sub-district office	Saturday	
2	Sub-district office emails payment information to FINO	Tuesday	After receiving muster roll data from the various field assistants, computer operators at the sub-district offices enter the muster roll data into a custom built

			information system. The information system automatically generates an electronic payment order which details which workers and pensioners should be paid what amounts for the week. This payment order is then sent to FINO as well as to the district headquarters.
3	Sub-district office delivers check for total amount to partner bank	Tuesday	Due to the central government's requirement that all NREGA wages must be routed via individual bank accounts (see section "Banks' Involvement" below), cash for NREGA workers and SSP pensions is first transferred via check from sub-district offices to partner banks. In practice, checks from each sub-district office are picked up and deposited in bank branches by FINO staff to ensure timely deposit of funds.
4	Partner bank transfers payment amount to FINO	Tuesday	After receiving funds for NREGA and SSP payments for all sub-districts in all districts, each partner bank transfers a lump sum amount equal to the total received (minus the banks' commission) to FINO.
5	FINO uploads payment information to core banking solution	Tuesday	To manage accounts at the back end, FINO has licensed the popular iFlex Flexcube core banking software. Account data is stored on a server hosted and managed by IBM in Bangalore.
6	CSP downloads payment information onto POT	Thursday	Before the CSP can process transactions, she must first download information on which beneficiaries should be paid what amounts from FINO's CBS server. Due to the limited availability of GPRS in rural areas, FINO has designed the POTs so that syncing between the POT and CBS is performed via a standard phone line.
7	FINO delivers cash to agent	Thursday	Due to the risks involved in having CSPs (all of whom are women) carry large amounts of cash from the local bank to their village, FINO staff hand deliver all cash weekly to each CSP.
8	CSP disburses cash to beneficiaries	Friday	See section "Front End: The Beneficiary's Experience" above for more information on this step.
9	CSP uploads	Saturday	After completing all weekly transactions, the CSP

	payment info from POT to CBS		must again sync her POT with the FINO CBS via a phone line so that FINO can verify that the transactions were indeed performed.
10	FINO retrieves any leftover cash from CSP	Monday	Often, a small minority of beneficiaries fail to claim their payments. After all payments have been made, FINO staff travel again to the CSPs to retrieve this leftover cash.

## 5.5. Agent Recruitment and Training

At the village level, all payment activities are managed by a network of trained agents, known as “customer service providers” or CSPs. FINO recruits CSPs by asking Gram Panchayat officials and village officers to nominate four or five candidates, typically relatively highly educated women who for some reason cannot work outside their village. All candidates are provided two days of rigorous training on how to process payments and operate the POT device. At the end of the training session, the candidates are given a test on the material and the highest scoring candidate is awarded the position of CSP. For the first two or three payment cycles, FINO staff travel to the village to provide technical assistance and troubleshooting to the CSP.

CSPs are paid 300 rupees (\$6.50) per month plus a commission of 0.25% of the total amount disbursed and are required to pay for the cost of using a phone line to sync up the POT devices out of these earnings.<sup>20</sup> Assuming average weekly disbursements of around 24,600 rupees (\$535)<sup>21</sup> and average weekly cost of syncing the POT with the server of 120 rupees (\$2.61)<sup>22</sup>, this translates into an estimated weekly income of 242 rupees (\$5.26). While this may seem like a relatively small amount considering the fact the fact that CSPs typically spend two full days processing payments, readers are reminded that the average wage for NREGA workers is only 80 rupees (\$1.74) per day. Further proof that the CSP incentive model is sufficient is that, to date, attrition has been extremely low among CSPs.

## 5.6. Banks’ Involvement

<sup>20</sup> In the initial pilot sub-districts of Thimmapur and Sissila, Karimnagar, the salary and incentive structure for CSPs is slightly different from that described here.

<sup>21</sup> Estimate of average weekly disbursement based on historical data of NREGA participation in Andhra Pradesh, FINO estimates of average number of beneficiaries per village, and government reported data on ration of NREGA workers to SSP pensioners. For exact list of assumptions, see **Appendix D**.

<sup>22</sup> Syncing typically takes about 30 minutes to perform and must be performed twice each week. The price for using a standard phone line is around 2 rupees per minute.

In January 2008, the central government, amidst concern that delivery of NREGA wages through post offices and local Gram Panchayats was leading to high levels of leakage, mandated that all NREGA wages be routed through individual bank accounts. Shortly after the announcement by the central government, responsibility for delivery of NREGA wages in Andhra Pradesh was divided up among all banks according to each bank's pre-defined "service areas"<sup>23</sup>. In compensation for their effort, the state government agreed to pay the banks 2% of the total amount disbursed as commission.

Four banks in Andhra Pradesh – Union Bank of India, Corporation Bank, ING Vysya, and Deccan Grameen Bank<sup>24</sup> – have opted to outsource the delivery of these benefits to FINO. Seven other banks (including State Bank of India, the largest bank in the country), have selected FINO competitor Zero Microfinance and Savings Support Foundation (ZMF) to process disbursements on its behalf (see section "ZMF: An Alternate Model of Payment Delivery" below). The arrangement between the banks and FINO and ZMF is the same in all cases: the banks pass on 1.75% of the total amount disbursed as commission to FINO or ZMF in exchange for delivering the payments to beneficiaries. The state government of Andhra Pradesh and the RBI actively encouraged (but did not force) banks to partner with one of the technology companies and played a facilitative role in discussions between banks and FINO and ZMF.

In order to satisfy the central government's requirement that NREGA wages be routed via bank accounts, FINO and ZMF open and maintain "bank accounts" on behalf of each beneficiary. However, in practice, these "bank accounts" are merely notional (all data on the accounts is maintained by FINO and beneficiaries cannot perform transactions on these accounts at any bank branch) and the banks have almost no involvement in the actual operation of the payment system.

This arrangement between the banks and FINO has important legal and operational ramifications. First, partner banks, rather than FINO, own the rights to the smartcards which may make it harder for FINO to offer additional services via the smartcards in the future. Second, RBI restrictions on what types of organisations can perform functions on behalf of banks have forced FINO to adopt an awkward internal legal structure in order to implement the smartcard payment scheme.<sup>25</sup> There is still

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<sup>23</sup> All banks in India, public and private, are assigned "service areas" based on their branch network. In the case of a government program which requires the cooperation of banks to implement, responsibility is divided among banks based on their service areas. Service areas are typically defined on a village by village basis which means that in many sub-districts FINO only services a small portion of the overall population leading to inefficiencies in scale. The state government is aware of this problem and is considering allocating responsibility for disbursement of NREGA wages and SSP pensions to banks on a sub-district by sub-district basis specifically to avoid this.

<sup>24</sup> Union Bank of India, Corporation Bank and State Bank of India are public sector banks while ING Vysya is a private sector bank and Deccan Grameen Bank is a regional rural bank (RRB – a particular type of public sector bank which is part owned by the state government and which has extensive presence in rural areas). In terms of the interaction between the banks and FINO and the local government, there is little difference between the public sector banks, private banks, or the RRB.

<sup>25</sup> According to the RBI, only certain types of individuals and organisations, of which for-profit entities like FINO are not included, can act as agents – labelled "business correspondents" by the RBI – on behalf of a bank and these business correspondents may only perform certain specified functions. To circumvent this restriction, FINO has set up a new non-profit entity, the FINO Fintech Foundation, which acts as a business correspondent for each of the four banks FINO is partnering with and which is technically responsible for

uncertainty as to whether the RBI will continue to allow this legal structure in the future. Third, the involvement of banks greatly increases the complexity of cash handling operations as it prevents sub-district offices from directly transferring funds to FINO (see the section “Problems Encountered and Lessons Learned” below for more information).

## 5.7. Progress to Date

As of 27<sup>th</sup> June 2008, FINO had effectively enrolled a total of 436,119 beneficiaries in the six districts in which it is conducting operations. As of 1<sup>st</sup> September 2008, 70 CSPs had been trained and were disbursing payments.

Table 2: Total Number of Beneficiaries and Total Number Enrolled by District and Program as on 27<sup>th</sup> June

	NREGS Clients			SSP Clients			Totals		
District	Target*	Enrolled	% Complete	Target*	Enrolled	% Complete	Target*	Enrolled	% Complete
Chittoor	93,378	46,159	49.4%	12,875	10,280	79.8%	106,253	56,439	53.1%
East Godavari	162,200	77,797	48.0%	23,761	16,299	68.6%	185,961	94,096	50.6%
Karimnagar	323,191	188,133	58.2%	51,415	41,152	80.0%	374,606	229,285	61.2%
Mehboobnagar	42,459	27,468	64.7%	6,811	5,593	82.1%	49,270	33,061	67.1%
Medak	10,275	8,000	77.9%	1,938	1,777	91.7%	12,213	9,777	80.1%
Warangal	15,293	11,102	72.6%	2,775	2,359	85.0%	18,068	13,461	74.5%
<b>Total</b>	<b>646,796</b>	<b>358,659</b>	<b>55.5%</b>	<b>99,575</b>	<b>77,460</b>	<b>77.8%</b>	<b>746,371</b>	<b>436,119</b>	<b>58.4%</b>

\* Target represents the total number of beneficiaries as listed by the government. Many of these supposed “beneficiaries” are in fact cases of fraud (e.g. – the person listed is in fact deceased) or persons not actively participating in the program. According to FINO staff, a realistic maximum enrolment rate is 90%.

all activities in the smartcard disbursement scheme. FINO Fintech Foundation in turn pays a fixed fee to FINO for the use of its technology. To date, the RBI has turned a blind eye to this, and several other instances in which organisations have effectively circumvented the restrictions in the business correspondent through innovative accounting techniques. There are signs, however, that this benign neglect may end soon. In early 2008, the RBI further restricted the business correspondent model by stipulating that business correspondents must be located within 15 km of a branch of the bank with which they are partnering. Even more worryingly, in September 2008, the RBI mandated that non-profit organisations with greater than 10% ownership by for profit entities could not serve as business correspondents. Although neither of these additional restrictions affect the smartcard payment scheme directly (the reach of the banks with which FINO is cooperating is large enough that the 15 km restriction does not come into play and, fortuitously, FINO Fintech Foundation is owned by the management of FINO rather than the company itself), they may be taken as obvious signals that the RBI is concerned about how some organisations are using the business correspondent model in ways it most likely didn’t originally anticipate. The Andhra Pradesh state government’s active promotion of the smartcard disbursement scheme accords FINO a degree of political capital, but there is always a risk that, if there were a widely publicized misuse of the business correspondent model, the RBI would clamp down on FINO’s activities in Andhra Pradesh.

## 6. Problems Encountered and Lessons Learned

Overall, the implementation of the smartcard payment scheme has proceeded remarkably well and without any major incidents. During the course of the implementation, FINO has encountered several minor problems, the most significant of which are described below:

### Resistance from local officials

While most officials at the district level have shown enthusiastic support for the smartcard payment system, FINO has encountered some resistance from local officials at both the Gram Panchayat and sub-district level. In some villages, Gram Panchayat officials, upset at being sidelined in the payment process, have deliberately failed to announce enrolment activities beforehand. Likewise, in some sub-districts, officials have either failed to provide FINO with information on NREGA and SSP beneficiaries in time for enrolments or failed to provide weekly payment information or checks on a timely basis. While frustrating for FINO, this resistance has not posed a major obstacle to the implementation of the payment system so far. As far as resistance may be taken as an indication that the payment scheme is taking power away from the hands of officials and putting it back in the hands of the beneficiaries, it may even be interpreted as a sign of success.<sup>26</sup>

### Cash handling

The central government's requirement that NREGA wages be routed via bank accounts has forced FINO to adopt a somewhat inefficient system for cash handling. Each week, FINO staff travel to the sub-district offices to retrieve a check for the total amount in payments to NREGA workers and SSP pensioners. Due to the government requirement, these checks are made out to the local partner banks rather than FINO and thus rather than directly cash this check and then distribute the cash to the local CSPs, FINO staff must first deposit the check in a local branch of the partner bank. The partner bank then consolidates these sums into one large lump sum and transfers it (minus their .25% commission) into a FINO account based in Hyderabad. Next FINO staff in Hyderabad courier a bearer check for each district's total amount to local FINO district heads (a bank transfer would take too long). Finally, FINO district staff cash the bearer check at a bank branch in the district headquarters, divvy up the amount, and then send it back out to each sub-district to be delivered to the appropriate CSPs. This pointless back and forth of cash significantly increase the cost to FINO of delivering payments and delays payments to beneficiaries by two days.

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<sup>26</sup> During the social audit attended by the author of this report, one GP official's complaint that "if [I] am not paying out this money, then what am I here for?" was met with laughter from the audience.

A second factor contributing to high cash handling costs is FINO's policy of delivering cash directly to CSPs rather than depositing it in a local bank account and having the CSPs withdraw the amounts on their own. As all CSPs are women, FINO has deemed it too dangerous to have the CSPs travel from local bank branches, which are often several kilometres away from their village, carrying large amounts of cash.

While FINO is in discussions with government officials and bankers to try to find solutions to these problems of cash handling, no obvious options, aside from a change in regulation, are apparent.

#### Uploading and downloading data to and from POT devices

As described above in the section on back end processes, CSPs must download payment information and upload transaction information to and from their POT devices on a weekly basis. Many of the CSPs we talked to complained that downloads and uploads took far longer than they had been told they would (30 minutes on average when they had originally been told that it would take around ten minutes) and that occasionally a problem in the connection in the middle of the upload or download would cause them to have to redo the entire process. Further, several CSPs complained that they must often perform two uploads of transaction data in a single week<sup>27</sup>. As many of the CSPs we talked to had to travel several kilometres just to access a phone line and are currently required to pay for all costs related to the uploads and downloads themselves, this increase in the number POT uploads they must perform directly affects their bottom line.

Yet it should be noted that despite the CSPs complaints, there has been very little attrition of CSPs to date belying the CSPs own assessment that this is a major cause of concern.

#### Mission Creep

An issue of greater concern is that of steadily increasing demands from district officials. In many districts, officials have mandated that FINO disburse payment for some beneficiaries who do not have cards. This not only reduces the efficiency of the payment process (as payments must be performed manually through the use of paper based processes) but also threatens to erode the key benefits, such as reduction of leakage, of using smartcards in the first place.

## **7. ZMF: An Alternate Model of Payment Delivery**

In addition to FINO, Zero Microfinance and Savings Support Foundation (ZMF) also delivers NREGA wages and SSP pensions via smartcards in Andhra Pradesh. ZMF, which uses a technology

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<sup>27</sup> To minimize risk, the FINO POT requires agents to upload transaction data every 36 hours at a minimum. In most cases, CSPs are able to process all transactions within 36 hours of the first transaction.

solution developed by its partner organisation A Little World (ALW) and has tied up with seven banks for delivering payments<sup>28</sup>, has adopted a payment model which shares many similarities with FINO's but also differs in certain key respects.

For enrolments, ZMF staff carry a single mobile phone along with a fingerprint reader capable of communicating with the phone via Bluetooth<sup>29</sup>. ZMF staff record most client details through the use of paper-based forms, with only the beneficiary's fingerprints, photo, and voice recording of the person's name being captured digitally. According to ZMF, this low footprint approach allows them to save costs as laptops, digital cameras, and portable generators (in the case of villages without a reliable power supply) are no longer required for conducting enrolment.

The technology used by ZMF staff for processing payments is similar to that used by FINO but differs in two key ways. First, rather than a single point of sale device, ZMF agents utilize three separate components when processing payments: a mobile phone, a fingerprint reader, and a receipt printer. In practice, these three components communicate automatically with one other so that for all practical purposes operating the components is equivalent to operating a single POT device. According to ZMF, a primary benefit of this technology setup is that the process of uploading and downloading payment and transaction information is greatly simplified as data can be sent automatically by the mobile phone. ZMF management claim that weekly uploads and downloads take no more than two minutes and can even be processed in the background while the agent conducts other tasks on the phone. One potential drawback of this method of data transmission however is that the technology required for transmitting data via the mobile networks (GPRS) has not been installed in all mobile base stations in India. According to ALW and ZMF management, this has not been a problem to date as all agents have been able to access a GPRS signal either within their village or by travelling a short distance.

Second, the smartcards disbursed by ZMF are contactless NFC ("near field communication") cards rather than contact cards like those disbursed by FINO. NFC smartcards are slightly more expensive than contact smartcards but provide the advantage that they must only be waved in front of the mobile phone (or other reader) rather than inserted and allow for significantly faster data transmission between the card and reader (less than a second for NFC vs. around 5 seconds for contact smartcards). In terms of the smartcard reader, there is little difference in cost between a device capable of reading NFC cards and one capable of reading contact cards.

In the future, ZMF and ALW plan on doing away with physical smartcards altogether. The fingerprints of each individual beneficiary will still be gathered during enrolment and beneficiaries will still be required to verify their identity through their fingerprint, but rather than storing fingerprint information on smartcards, fingerprints will be stored on the mobile phone itself. (For more information on the potential for payments to be processed without the use of smartcards see the section "Are Smartcards

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<sup>28</sup> These banks are State Bank of India, State Bank of Hyderabad, Andhra Bank, Axis Bank, Union Bank, Andhra Pradesh Grameena Vikas Bank, and Punjab National Bank.

<sup>29</sup> The addition of Bluetooth technology to the fingerprint reader has been engineered by ALW.



Really Necessary for Processing Payments?") SBI, ZMF's largest partner bank, has already agreed to dispense with the smartcards and ZMF is hopeful that other banks will follow suit. According to ZMF and ALW, doing away with the physical smartcards would drastically reduce the upfront capital investment required to implement the payment solution.



Technology developed by A Little World for processing payments (Note: Photo is from 2007. In the fingerprint reader and receipt printer are combined in a single device.)current version of ALW's point of transaction station the

## 8. Impact on the Beneficiary

While payment mechanisms are most commonly evaluated according to their impact on cost of delivery and program efficiency, altering the mechanism for disbursing funds can have important effects on the end beneficiary as well. In this section, we compare the beneficiaries' experience under the smartcard payment scheme with other traditional methods of payment in terms of convenience, susceptibility to "skimming" by those responsible for disbursing benefits, beneficiary empowerment, and financial literacy.<sup>30</sup>

<sup>30</sup> Readers are reminded that the central government has mandated that all NREGA wages must be delivered via individual bank accounts. As Andhra Pradesh, and most other states, continue to use post office savings accounts and other methods of payment delivery for NREGA wages and it is still unclear whether the central government will force states to comply with this mandate we have included these other options in our analysis.

## 8.1. Convenience

Beneficiaries were asked to compare the convenience of receiving payments via smartcards with the convenience of receiving payments via traditional methods along three axes: number of days spent waiting on payments to become available, distance to payment processing point, and time spent in line waiting to receive payments. In some cases, this data was supplemented with anecdotal information from interviews with bankers, Gram Panchayat officials, and CSPs.

Table 3: Comparison of Four Major Payment Mechanisms According to Measures of Convenience


	Days spent waiting on payments to become available	Distance to payment processing point	Time spent waiting in line for payments
Smartcards	7 days	5 minutes walking distance	20 minutes to 1 hour
Post office savings account	7 to 14 days	5 minutes walking distance	1 to 2 hours
Bank account	7 or 14 days	6 km (about three hours)	2 hours to a full day
Village officer or GP official	NA*	5 minutes walking distance	1 hour

\* All of the beneficiaries we spoke to who had received benefits via village officers or Gram Panchayat officials were SSP pensioners. As SSP pension amounts do not vary and are delivered on the same day each month, it is difficult to infer from this information how long it would take for NREGA wages to be delivered via village officers or Gram Panchayat officials.

As the table above shows, smartcards were clearly the best option for beneficiaries in terms of convenience, though their advantage vis-à-vis post office savings accounts is not overwhelming.

## 8.2. “Skimming”

A key motivation for the introduction of smartcards in processing government benefits is that they hold great potential for increasing transparency in the system and reducing corruption. Perhaps the most venal form of corruption is when the person responsible for disbursing the payment demands a “cut” of the amount to be disbursed, otherwise known as “skimming”. (We look at the impact of the payment scheme on other forms of corruption in the next section.)



Assessing the true extent of skimming in the distribution of NREGA wages and SSP pensions is complicated by the fact that beneficiaries may be unwilling to accurately report instances of corruption out of fear of retribution from those committing the skimming. In order to more accurately assess the incidence of skimming in the distribution of NREGA wages and SSP pensions via the smartcard payment system as compared to other methods, we not only asked beneficiaries directly whether they had been the victim of skimming but also enquired whether they had ever heard of skimming being conducted by a CSP, post office employee, bank employee or Gram Panchayat official / village officer and what would happen to their benefits if they failed to retrieve their benefits on time (a common form of skimming is for the person disbursing the benefits to claim that the benefits are no longer available if a person fails to pick them up on time). In addition, valuable information regarding the relative incidence of skimming in different payment methods was gathered during the public hearing of an audit conducted in Thimmapur sub-district of Karimnagar district.

Contrary to our expectations, not a single beneficiary out of the ten interviewed for this report had either been the victim of skimming or had heard of a case of skimming when NREGA wages or SSP payments were disbursed via smartcards, bank accounts, or post office savings accounts. Further, no complaints of skimming involving payments disbursed via these three methods were raised during the public hearing of the audit conducted in Thimmapur sub-district. This is especially surprising in the case of post office savings accounts as there is often little oversight (most post office branches in rural areas are staffed by a single employee) and post office employees enjoy a reputation (perhaps undeservedly) of occasionally asking for a cut of money disbursed when dealing with rural clients. Considering the common perception throughout India that post office employees occasionally skim money, it is likely that this surprisingly low rate of reports of skimming is a direct consequence of the audit system in place in Andhra Pradesh and is unlikely to hold true in other states.

However, in the case of disbursement via village officers or Gram Panchayat officials, several of the beneficiaries we talked to stated that skimming is indeed a problem. In addition, during the public hearing of the NREGA audit, complaints of skimming by village officers and Gram Panchayat officials were raised by two NREGA workers. Considering that only a very small proportion of overall payments are processed via village officers or Gram Panchayat officials in this sub-district, the fact that these complaints were made is significant.

### **8.3. Empowerment of Female Beneficiaries**

Under traditional payment methods, such as through a post office savings account or through Gram Panchayat officials, it is customary for a man to pick up NREGA wages on behalf of his wife or sister. One salient effect of introducing smartcards for payment processing is that this practice of husbands and brothers retrieving wages on a woman's behalf is prevented due to the fingerprint verification process.

While it is impossible to estimate the effect of this change, when one considers the facts that a) a majority number of NREGA workers are women (Dreze and Oldiges, 2007) and b) that research shows that directing funds towards women can result in substantial improvements in overall household welfare (Maluccio and Quisumbing, 2000, McClafferty and Skoufias, 2001, and Hallman, 2000) it is likely that the impact is substantial.

## 8.4. Financial Literacy

A fourth way in which the smartcard payment scheme could potentially affect the beneficiaries is by raising their levels of financial literacy. At a basic level, the smartcard payment scheme does not fundamentally alter the way beneficiaries access their money, nor have any additional services been offered via the cards<sup>31</sup>, nor has FINO provided any financial literacy training to beneficiaries so the potential impact of the scheme on levels of financial literacy are limited. Nonetheless, there are two ways in which the scheme could potentially indirectly increase financial literacy among beneficiaries. First, as the payments are in principle delivered via bank accounts, the scheme may lead to increased awareness of the option of saving in a bank account. Second, as shown above, the timing of payments made via the smartcard system is more consistent than via other payment methods, especially when it comes to NREGA wages (exactly 7 days for payments made via smartcards versus 7 to 15 days for post office savings accounts and 7 or 14 days via bank accounts). This increased regularity might allow beneficiaries to better plan their future financial needs and lead to increased awareness of how to go about conducting such planning.

However, we found little evidence of any impact on financial literacy during our site visit. Despite the fact that the partner bank's logo is displayed prominently on the smartcards, most beneficiaries were completely unaware that banks played any role in disbursing payments. Further, any effect of the increased regularity in the payment of NREGA wages was more than offset by a high uncertainty in the availability of NREGA work. Due to the high demand for NREGA work, local officials have begun rationing NREGA projects to villages on a rotating basis. As a result, beneficiaries we talked to had little idea when they would next get a chance to perform NREGA labour.

Table 4: Performance of the Four Major Payment Mechanisms from Beneficiary's Perspective

Payment method	Is Convenient	Prevents skimming?	Enables Women's Empowerment?	Increases Financial Literacy
Smartcards	Yes – very	Yes	Yes	No
Post office savings	Somewhat	Yes	No	No

<sup>31</sup> As mentioned earlier, while all beneficiaries technically have a bank account in their name, at this time these accounts are merely notional and beneficiaries are not able to conduct transactions on these accounts at any bank branch.

accounts				
Bank accounts	No	Yes	No	No
Village officer or GP official	Unknown	No	No	No

## 9. Impact on Program Efficiency

### 9.1. Direct Costs

#### 9.1.1. Cost to Government

In order to help offset the initial capital investment required to implement the smartcard payment scheme, the RBI has agreed to provide FINO 50 rupees for each smartcard distributed as part of the payment scheme. Aside from this cost, there are no additional marginal costs to the government: as with other payment methods, the government of Andhra Pradesh provides exactly 2% of the overall amount disbursed as fee for processing payment transactions.

To put these figures in perspective, in fiscal year 2007-2008 the average number of days worked per adult member listed on any NREGA job card was only 8.<sup>3233</sup> At this level of program participation, 50 rupees is roughly equivalent to the direct cost to the government (at 2% of total amount disbursed) of disbursing NREGA wages for four years for a single beneficiary. Yet, if current growth in program participation continues, NREGA participation will likely triple in the coming year thus reducing the cost of the smartcards as share of overall disbursement costs significantly.

While it is still too early to definitely say whether the benefits to the government of the payment scheme exceed this marginal cost, in light of the substantial benefits to beneficiaries of the new payment scheme as well as the indirect benefit to the government in the form of reduced expenditure on fraudulent transactions (discussed in more depth below), the one time 50 rupees per beneficiary marginal cost of the payment scheme appears reasonable.

#### 9.1.2. Cost to Banks

Assessing the true cost of delivering payments via either post office savings accounts or banks by estimating these institutions' cost of operations is beyond the scope of this paper. Nevertheless, we may

<sup>32</sup> Data gathered from <http://nrega.ap.gov.in>

<sup>33</sup> This figure represents the total number of work days generated in fiscal 2007 divided by the total number of adult household members listed on all NREGA job cards issued in the state. As NREGA job cards list all adult household members regardless of their participation in the programme, this figure likely understates actual number of days worked per active worker (those likely to have enrolled for a FINO smart card).

infer from banks' lack of enthusiasm for the task (most bankers we spoke to indicated that they would prefer not to be responsible for these transactions) that the real cost for banks' is considerably higher than 2%.

### 9.1.3. Cost to FINO

Due to the sensitive nature of cost information, FINO was reluctant to reveal the exact costs incurred in delivering payments. Nevertheless, FINO management is confident that if savings accounts and disbursements of Indira Awas Yojana loans are also delivered via the smartcards (see section "Leveraging the Smartcards to Deliver Additional Services" below for a description of FINO's plans to offer these services) FINO will recover its investment in three years.

Assuming a constant overall number of NREGA workers<sup>34</sup>, FINO's variable costs and revenues per village are determined primarily by the average number of days worked per NREGA worker per year.<sup>35</sup>

<sup>36</sup> In the table below, we present the results of analysis of the minimum number of days of work per NREGA worker per year required for FINO to recover its initial investment in three and five years. As the regulatory restriction that benefits must be routed via bank accounts may not be present in other countries, we also repeat this analysis under the assumption that the requirement that NREGA wages be routed via bank accounts is lifted so that these results may be more easily generalized to other contexts.

Our analysis indicates that without delivering any additional services via the smartcards, FINO will recover its up front investment in 5 years provided each NREGA worker performs at least 26.5 days of work per year. Under the same scenario, FINO will recover its up front investment in 3 years if average days worked per year reaches 39. In the case that the government requirement is lifted only 19.6 days of work per NREGA worker per year would be required for FINO to recover its up front investment in 5 years. Likewise, FINO would recover its up front investment in 3 years if average days worked per year reached 30. As mentioned above, in fiscal year 2007-2008 the average number of days worked per adult member listed on any NREGA job card was only 8 but is likely to grow to around 24 by the end of the current fiscal year. (See **Appendix E** for sample calculations and a list of inputs and assumptions used to generate these estimates. *The analysis below is only suggestive in nature and some costs may be inaccurate.* Many of

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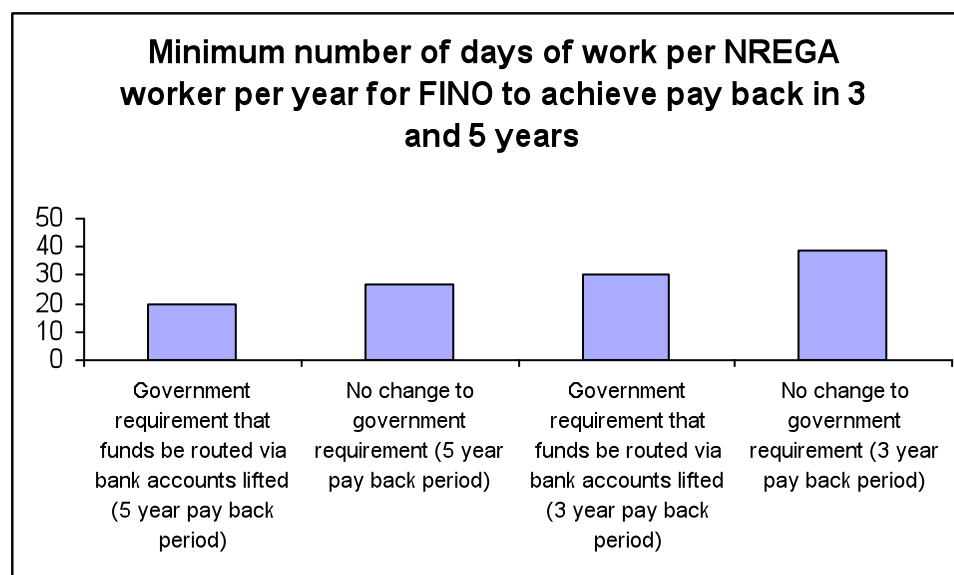
<sup>34</sup> Based on interviews and focus group discussions, it seemed unlikely that the overall number of NREGA workers will change significantly in the future.

<sup>35</sup> Excluding up front costs, FINO's revenues and costs depend almost exclusively on the total amount of funds disbursed via the payment system. As the list of SSP pensioners is fixed and NREGA wages (for the most part) do not vary, variation in the total amount disbursed is driven by the number of NREGA workers and the average number of days worked per year.

<sup>36</sup> Average number of days worked per worker should not be confused with the average number of days worked per household. The worker has been selected as the unit of analysis as cards are individually distributed to each worker and thus costs are more directly related to the number of workers rather than households participating in the program but it should be remembered that the guarantee of 100 days of work is for entire households rather than individual workers. There are typically about two workers per household.

the costs related to FINO's back end operations are sensitive and thus we have been forced to rely on our own estimates rather than exact costs from FINO.)

Figure 2




As demand for NREGA work currently greatly outstrips supply in Andhra Pradesh<sup>37</sup>, the number of days worked per NREGA worker per year depends primarily on the Andhra Pradesh government's desire and capacity to scale up the programme in coming years. Over the past year, the government of Andhra Pradesh has repeatedly declared its commitment to scaling up NREGA in coming years. Care should be taken in interpreting the results presented above, but they suggest that a commission of 1.75% is reasonable provided that the Andhra Pradesh government does indeed fulfil this commitment.

The analysis above also clearly shows the effect of the government requirement that NREGA wages be routed through bank accounts on FINO's bottom line. If this requirement were lifted, cost handling costs per village per year would decrease by approximately 2000 rupees (\$43.47) while revenue per village per year would increase by approximately 4000 rupees (\$86.96).

## 9.2. Indirect Costs (Fraud and Corruption)

In addition to direct effects, altering the payment mechanism used to disburse government benefits may have important indirect effects on the overall cost and efficiency of a government program as well

<sup>37</sup> Nearly every NREGA worker we talked indicated that they would have preferred to work more had more work been available. Indeed, data collected for this report revealed that the daily wage rate for NREGA labour exceeds that of the private market in many parts of Karimnagar district which suggests that the demand for NREGA labour on the part of poor households is virtually limitless.



through its impact on fraud and corruption. In the case of the smartcard payment scheme, there are two key ways in which the introduction of the smartcards may reduce overall costs. First, by verifying that each beneficiary is in fact a unique, actual person during the process of enrolment the scheme may reduce the number of fictitious beneficiaries. This may be especially relevant in the case of SSP as (according to popular wisdom) many of the listed beneficiaries are in fact deceased. Second, the smartcard system may reduce corruption in the reporting of NREGA worksite details as well. Without the use of smartcards, venal field assistants acting in collusion with a post office employee, Gram Panchayat official or village officer may fraudulently report that someone has worked and collect wages on their behalf.

Quantifying levels of corruption in government programs is notoriously difficult. Nevertheless, limited evidence exists to suggest that the smartcard scheme has significantly reduced levels of fraud and corruption. First, during the enrolment stage, FINO identified 16,800 sets of duplicate fingerprints in the data through the process of fingerprint matching (i.e. – 8,400 beneficiaries went through the enrolment process twice).<sup>38</sup> This represents almost 2% of overall enrolment. While it is impossible to infer that the identification of these duplicate IDs has translated into an equivalent reduction of fraud,<sup>39</sup> it is safe to say that some reduction in fraud has occurred as a result of this process. Further, FINO reports that only 90% or so of people listed as beneficiaries by government offices actually show up for enrolment. While it is impossible to make exact statements regarding the relative share of no-shows which are due to fraud, it is very likely that many are due to deceased or fictitious beneficiaries.

Evidence from the public hearing of an NREGA audit attended by the research team suggests that the smartcard payment system has led to a reduction in fraud in the weekly payment process as well. Despite the fact that FINO is disbursing payments in nearly all villages in the sub-district for which the audit was conducted, auditors did not find a single irregularity in the payment of wages via the smartcards. In contrast, several instances in which muster roll data did not match with that on the workers' job cards or the workers' own recollection were uncovered in areas where other payment methods were used.

While these benefits are substantial and should not be overlooked, it is important to remember that smartcards are not a panacea when it comes to eliminating fraud and corruption. Without an effective audit system in place, the additional information generated through the use of the smartcards may go to waste. Further, even with a solid audit system, the smartcards have limited capacity to prevent some forms of corruption. In particular, the smartcard system will not help auditors catch instances of corruption in which a “worker” and a field assistant collude to report that the workers has worked more hours than he or she actually has. (However, if the smartcards were also used to record worksite details, as described in **Appendix F**, they may in fact reduce corruption of this type.)

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<sup>38</sup> In the case that a duplicate is found, FINO randomly selects one of the “beneficiaries” to distribute the smartcard to.

<sup>39</sup> Currently, limited payment via traditional methods is taking place side by side with the smartcard payment system even in areas where FINO is operating. Persons who are denied duplicate FINO smartcards may still be collecting two sets of benefits – one via the smartcards and one via other traditional payment methods.



## 10. Leveraging the Smartcards to Deliver Additional Services

One of the major benefits of smart cards is that multiple services can be delivered via a single card, with client data for each service stored separately in a secure “slot” accessible only to the provider of that service. FINO’s long term strategy is to reap economies of scope by offering as many services as possible via the smartcards. Rather than serving solely as a conduit for processing NREGA wages and SSP pensions, FINO’s vision is that the payment system serve as an extension of the formal banking network with beneficiaries accessing a variety of different products via their smartcards, effectively transforming the payment system from a “pull” system into a “push” system. Those not originally enrolled and provided smartcards will be able to access these services as well by signing up for a smartcard at a FINO agent stationed in each sub-district.

As described in the section “Payments and Disbursements – Concepts”, financial products can be “added-on” or “added-in” to existing payment systems. Currently, FINO has plans to “add-on” a flexible savings account and “add in” disbursements of a subsidized government housing loan. In the section below, we describe FINO’s plans for expanding the existing payment system by adding these additional services, analyse their likely impact on financial inclusion, and investigate the potential for further services to be offered via the platform.

### 10.1. Savings


FINO is currently in talks with all four partner banks to “add on” a flexible savings account to the payment system. Although the details of the savings accounts have yet to be finalized, the accounts will most likely have no or very low minimum balance requirements and offer a certain number of transactions for free each month.

Interviews with current beneficiaries indicate that the demand for such savings services, and thus its likely impact on financial inclusion, is large. Nearly all of the beneficiaries we spoke to, like many in rural India, lacked access to flexible, convenient savings products.<sup>40</sup> For most, the nearest bank branch was too far away to be considered a realistic option for day to day savings. In addition, while the post office and NBFC deposit taking companies such as Peerless were present in nearly all villages we visited their products are limited to inflexible recurring deposit accounts.

The lack of savings options is felt particularly acutely by those who cultivate their own fields, a category which a majority of the beneficiaries we spoke to belonged to. Due to the half yearly cycle of planting and harvesting, the income stream of self-cultivators is highly irregular. In the absence of viable

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<sup>40</sup> While a few of the beneficiaries did in fact have savings accounts, this was solely for the purpose of obtaining a loan from the bank. None of these beneficiaries actively used their accounts for savings.



saving options, most households turn to loans from moneylenders to even out this half-yearly cycle of pre-harvesting lack followed by post-harvest glut. With the addition of NREGA wages as another potential source of income, the need for flexible, convenient savings options has become even greater as self-cultivators typically participate in NREGA works just after the harvest season, when they are flush with cash.

## 10.2. Indira Awas Yojana (IAY)

FINO management is also in discussion with government officials and partner banks to process disbursements of loan money delivered via the Indira Awas Yojana (IAY). IAY is a centrally sponsored scheme which provides subsidized loans of between 12,000 rupees (\$261) and 38,500 rupees (\$837) for housing to the poor. While IAY funds are technically considered loans, repayment rates in most areas are negligible. Currently, IAY funds are disbursed through banks but both bankers and government officials are eager to find an alternate mechanism of disbursement. As there is likely a high degree of overlap between IAY recipients and NREGA workers and SSP pensioners, delivering these funds through the existing smartcard system, while marginally increasing the difficulty of cash handling, would otherwise present few problems.


## 10.3. Other Potential Services

The smartcard system could also potentially be used to collect repayments on **loans** from either banks or microfinance institutions. Several of the beneficiaries we spoke to had loans outstanding from a microfinance institution and a couple even had outstanding bank loans. Yet while using the smartcards to process loan repayments holds great potential for reducing the cost of processing these transactions, it may also lead to a fundamental conflict of interest for the CSPs. If they are provided incentives to ensure high repayments of loans, CSPs may be tempted to withhold a portion of a beneficiary's payments unless the beneficiary agrees to use the money to repay the loan. As history shows, the potential this conflict of interest to lead to a greater political conflict is enormous.<sup>41</sup> The bank or MFI could purchase an additional POT and hire another person to collect repayments using the second smartcard, but this would likely negate much of the cost savings of using the existing system of payments processing.

Likewise, offering **insurance products** via the smartcards faces large challenges. With the planned introduction of a heavily subsidized government health insurance scheme for poor households (for which the smartcards most likely cannot be used; see **Appendix F** for more information), private health

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<sup>41</sup> In 2006, the state of Andhra Pradesh was the site of an intense conflict between local government officials and microfinance institutions.



insurance products for the poor are unlikely to be viable. In the case of other insurance products such as life or weather, the benefits of smartcard usage are minimal.

In addition to financial products, the smartcards could also potentially be used to deliver benefits from other **government programs**. During our meetings with FINO staff and government officials, three additional government services were proposed for delivery via the smartcards: Rashtriya Swasthya Bima Yojana (a subsidized health insurance program for poor households), the Public Distribution Scheme (a program which provides heavily subsidized basic food and fuel for poor households), and recording of NREGA worksite details. In **Appendix F** we describe these government programs and assess the potential for the existing smartcard payment system to be leveraged to deliver benefits for these other government programs. We find it unlikely that the smartcards distributed by FINO could be used to deliver benefits for any of these programs in the near future.

## 11. Are Smartcards Really Necessary for Processing Payments?

Up until this point in the paper, we have taken as given that smartcards are essential to the functioning of biometric payment systems. In fact, smartcards are not, as commonly believed, necessary for biometric verification. Biometric information such as a beneficiary's fingerprints can just as easily be stored on the POT device itself as on the smartcard. Thus, the entire payment system, complete with biometric verification of the beneficiaries presence during transactions, can be implemented without the use of smartcards. It is important to stress that, aside from the removal of the physical smartcards themselves, such a payment system would otherwise appear identical to the existing payment system described in this report: a network of agents equipped with mobile point of transactions devices; back end cash handling operations to supply these agents with the cash; and back end data management to track which beneficiaries should be paid what amounts would all still be necessary.

In evaluating the advantages of using physical smartcards to implement the payment it is useful to enumerate precisely the advantages, and disadvantages of the cards themselves in isolation from the other elements of the payment system. First, smartcards obviate the need for agents to enter an ID number. With the use of smartcards, agents need only insert the smartcard into the POT device and the device will recognize the client and pull up his or her stored fingerprints. Without smartcards, the CSP would have to first enter in an ID number (but not PIN) in order for the POT device to know which client the transaction is being processed for.<sup>42</sup> However, considering the fact that it takes the POT device a few seconds to read

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<sup>42</sup> Readers may question why the POT couldn't simply recognize the beneficiary based solely on their fingerprints without entering in an ID number. This is because without an ID number it would be necessary for the POT to match the beneficiary's fingerprints against all fingerprints in its database rather than just a single one. Performing multiple matching is both computationally more difficult and much less secure due to the increased risk of an incorrect match.

the smartcard anyway, long enough for the CSP to manually enter in an ID number, this reason is of only marginal importance in the current context.

Second, smartcards are especially useful in the case of migrant beneficiaries. Without smartcards, customer details, including biometric information, must either be stored locally on the POT or there must be a constant connection between the POT and a back end server.<sup>43</sup> Considering India's immense population, storing details for all beneficiaries of a program on each POT is not feasible; given the lack of adequate telecom infrastructure and the expense involved in maintaining a constant connection, nor is requiring that POTs maintain an always-on connection with a back end server.

Yet this concern is not particularly relevant for either NREGA or SSP. In the case of NREGA, there is no provision for migrants to perform NREGA work in an area other than their own village (in fact, one of the primary objectives of the program is to reduce the need for migration in order to find work). Likewise, provision of SSP pensions has always been conducted on a village by village basis. However, this concern would be important if the smartcards were used to deliver other services – in particular flexible savings accounts or health insurance. Savings accounts holders may need to conduct transactions at locations other than their own village, and customers of a health insurance policy may need to be treated at the nearest hospital regardless of where they are rather than traveling to one near their own village.


Third, smartcards allow transaction and other data to be stored securely on the card itself. Again, this concern is not especially relevant in the case of NREGA or SSP but would be crucial if the cards were used to provide savings or health insurance products in an environment where the POT cannot maintain a connection to a back end server. In the case of savings accounts, this prevents account holders from withdrawing their full balance from one agent and then withdrawing the full balance again from another agent. In the case of health insurance, certain information, such as results from an HIV test, may be sensitive to the beneficiary and should only be readable by valid agents equipped with a legitimate POT device.

There are important disadvantages of using smartcards though. First, and most obviously, they are expensive. A single smartcard, including customization, can cost over \$2. To put this in perspective, this is approximately 10% of the average amount earned per NREGA worker in Andhra Pradesh during fiscal year 2006. (Dreze and Oldiges, 2007) Second, cards may be damaged. While we found extremely few cases of lost or damaged cards during our site visit, this concern cannot be ignored.

All this suggests that, if the system is replicated in other areas, it would be prudent for the designers of the system to carefully assess whether there is a rationale for additional services – especially savings products or health insurance – to be delivered via a single platform and, if not, to consider doing away with the cards. Sadly, the decision of whether or not to use smartcards may be based on considerations other than that of just cost and benefit. According to one expert interviewed for this report, biometric-enabled

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<sup>43</sup> It should be noted that, unlike with traditional mag-swipe cards (such as those used for most credit cards), with smartcards certain beneficiary-specific details (in particular the public key of the smartcard held the beneficiary) must be stored on the POT in order for it to be able to process payments for the beneficiary. The size of this data is relatively small though.



payment schemes have always been pitched to government officials and bankers as “smartcard schemes” and so now efforts to convince these decision makers that smartcards are unnecessary are met with, at best, confusion, and, at worst, hostility.

## 12. Conclusion

The FINO scheme to disburse NREGA wages and SSP pensions via a single smartcard in Andhra Pradesh represents an unprecedented experiment in India for large scale delivery of public services via smartcards. Overall, our analysis reveals that, to date, this experiment has largely been successful. The payment system has resulted in greater convenience and empowerment for the end beneficiary and reduced fraud and corruption at the back end all while being cost neutral from the government’s perspective. Our analysis also suggests that FINO too will benefit and recover its investment in a reasonable amount of time so long as the government of Andhra Pradesh fulfils its commitment to scale up the NREGA programme in coming years. FINO’s plans to deliver additional services via the cards, especially its plans to “add on” a flexible savings product, will likely increase the benefits of the payment system even further for both FINO and the end beneficiaries.

While our analysis reveals that the payment scheme has been successful in the state of Andhra Pradesh, care should be taken in generalizing from these results to other states. Andhra Pradesh, due to the unique set of systems and processes it has put in place for implementing NREGA which have resulted in extraordinarily low levels of corruption, especially of skimming, is an anomaly. Implementing a similar smartcard payment system in another state with higher existing levels of corruption could very well result in even greater benefits since one of the primary potential benefits of smartcards is that they may reduce skimming and other forms of corruption which are relatively rare in Andhra Pradesh. On the other hand, it could be that the comparatively high capacity of local government officials in Andhra Pradesh has been an essential ingredient to the functioning of the smartcard payment system and that any attempts to replicate this experiment in other states with lower levels of local capacity would only result in failure.

Our analysis also reveals that if the central government’s requirement that NREGA wages be routed via bank were removed the payment system could be improved even further. This requirement needlessly adds costs to the delivery model by necessitating an awkward and redundant model of cash handling. A targeted relaxation of this restriction in the case of disbursement via smartcards could both reduce the time spent by beneficiaries waiting for their payments as well as cut down on the cost of payment delivery. While the adoption of the requirement was no doubt a reasonable response to concerns over corruption in alternate payment methods, it serves little purpose in the context of a smartcard payment system.

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## 14. Glossary

ALW	A Little World
	Customer service provider (agent who performs transactions with the help of a
CSP	POT)
	Process of gathering beneficiary details such as name, address, and fingerprints
Enrolment	which takes place prior to distribution of smartcards
	Official at village level responsible for supervising NREGA worksites for the
Field assistant	village
GPRS	General Packet Radio Service – a packet based protocol for transmitting data

	over a GSM mobile network
Gram Panchayat	Locally elected village council
Gram Sabha	Electorate of a single Gram Panchayat
	Indira Awas Yojana – a government subsidized housing loan for poor households
IAY	
	Mandal Parishad Development Officer (local sub-district official responsible for implementation of SSP, NREGA, and several other anti-poverty programs)
MPDO	
	Record of worksite details, including amount worked by each worker, maintained by each village
Muster roll	
NREGA	National Rural Employment Guarantee Act
Panchayat	Raj
Institutions	Set of locally elected bodies at the village, sub-district, and district levels
	Point of transaction device (mobile device capable of reading smartcards and fingerprints which is used to process transactions)
POT	
RBI	Reserve Bank of India
SSP	Social Security Pensions

## 15. Appendix A – Questions Asked of Beneficiaries

### Background details

1. Mandal
2. Village


### Basic Household Information

1. Name of respondent
2. Relationship to head of household
3. Religion
4. Poverty status on ration card
5. Religion
6. Caste category

### Household Details

(For each household member the following information was collected: name, gender, relationship to head of household, age, year of finishing study, marital status, and occupation.)





### Assets and income

1. Do you own any land? (If “no” skip next few questions)
2. How much land do you own?  
(For each crop, the following information was collected: crop, total area cultivated, total amount in fertilizer and seeds spent on this crop, number of planting seasons per year, total revenue from sale of this crop, and where and to whom the crop was sold.)
3. Do you own any livestock?
4. Number of each type of livestock
5. Not including NREGA, how many days did you do wage labour over the past year?
6. Not including NREGA, how many days did other household members do wage labour over the past year?
7. What is the average daily wage you earn for this work now?
8. What was the average daily wage for this work before NREGA?
9. Not including NREGA, does your household have any other sources of income?

### Enrollment

1. How did you first hear about the smartcards?
2. What were you told about the smartcards?
3. Once you had given your fingerprints and copy of ration card, how long did it take to receive your smartcard?

### NREGA

1. Do you or any other household members participate in NREGA? (If “no” then skip this section)
2. How many days did you work in NREGA last month?
3. How many days did you work in NREGA last year?
4. What is your average wage per day when you do NREGA work?
5. Do any other members of your household work in NREGA?
6. In total, how many days did other members of your household work in NREGA last month?
7. In total, how many days did other members of your household work in NREGA last year?
8. Do you typically put away some portion of your NREGA wages as savings? If so, how much and how often?
9. Do you set aside a portion of your NREGA wages to repay loans? If so, how much and for which loans?

### SSP

1. Do you receive an SSP pension? (If “no” skip this section)
2. What type of pension do you receive? (old age, physically challenged, mentally handicapped, or widow)

3. For how long have you been receiving this pension?

#### Receipt of Wages and Pension


1. How much time does it take for you to travel to the Gram Panchayat office?
2. How much money does it cost for you to travel to the Gram Panchayat office?
3. How much time does it take for you to travel to the local post office?
4. How much money does it cost for you to travel to the local post office?
5. How much time does it take for you to travel to the nearest bank branch?
6. How much money does it cost for you to travel to the nearest bank branch?
7. On average, how much time do you spend waiting in line to receive payment from the CSP?
8. Before you were given a smartcard, how did you receive payment for NREGA wages / SSP?
9. (if answer to above question was “post office”) Did the post office employee ever take any of your money?
10. Before you were given a smartcard, on average, how many days did you have to wait before receiving payment?
11. Before you were given a smartcard, on average, how much time did you spend waiting at the post office or bank branch to receive payment?
12. How much would you be willing to pay to receive your wages immediately on the Friday after you finish work?
13. How much would you need to be paid to be willing to postpone collection of wages for an additional week?
14. Overall, do you think that the current method for paying SSP and NREGA is better or that the post office / bank account is better?
15. Do you have the receipts from the CSP? (just check to see if they have all the receipts for last few transactions)
16. If you don’t withdraw all of the money in one week, what will happen to the money?

#### Loans

(The following information was collected for each loan outstanding from the household: household member in whose name the loan was taken out, total amount borrowed, amount outstanding, interest rate, date received, tenure, source (bank / microfinance institution / SHG / moneylender / friends or family), and the purpose for which loan money was used)

#### Savings and Insurance

1. Do you have a bank account?
2. (if answer to above is “yes”) Which bank?
3. Are you a member of a chit fund?
4. (if answer to above is “yes”) What is the required contribution and at what frequency must this sum be contributed?
5. Do you have a post office savings account?

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6. Do you save with an NBFC?
  7. Do you have any insurance policy? (record type)

#### Yearly income cycle

(Information was gathered on the primary and secondary income generating activities for respondents for each month of the year.)

## **16. Appendix B – Details of NREGA**

### **16.1.1. Implementation Guidelines**

Responsibility for the immense task of generating sufficient work for all who demand it and for supervising worksites is delegated to the Panchayati Raj Institutions in the act. Gram Panchayats are tasked with estimating local demand for work, suggesting suitable projects, issuing job cards for new job seekers, monitoring worksites, and implementing at least 50% of worksites. Block Panchayats are responsible for ensuring that job seekers are provided with work within 15 days and identifying appropriate works if the Gram Panchayat fails to do so. (In some states, these responsibilities have been legally devolved to the Gram Panchayats.) District Panchayats are required to develop five year plans based on overall district needs and to coordinate NREGA activities at the district level. (Right to Food, 2005)

### **16.1.2. Provisions for Transparency**

One of the most innovative aspects of the NREGA is the multitude of provisions built into the act to ensure transparency in the program. First, all households participating in the programme are issued job cards and details of work completed must be maintained in these job cards on a weekly basis. Second, worksite records containing details on how much each person has worked at the site (known as “muster rolls”) must be maintained daily at each worksite, made available at the Gram Panchayat office, and submitted to the Gram Sabha<sup>44</sup> on a regular basis. Muster rolls must also be provided within 15 days at a nominal cost to any “interested” party which requests them. Third, wage payments must be made in a public place and on specified days. Fourth, the act prohibits bureaucrats from hiring any private agency or contractor for implementing any aspect of the work.

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<sup>44</sup> The term “gram sabha” refers to the adult villagers who compose a gram panchayat’s electorate. Gram panchayat officials are required to conduct open hearings which may be attended by the “gram sabha” at least twice a year.

Last, and most uniquely, the act requires that “social audits” of NREGA works be conducted once every 6 months. In the text of the act, social audits are defined as audits conducted by the gram sabha, but in practice the term “social audit” has come to be used for nearly any type of audit of NREGA works be it by the gram sabha acting alone, by an independent NGO, or even by a government agency. This provision for audits in which outside organisations may participate is unprecedented in the history of national schemes in India and has received a large amount of attention from the press. In many areas across the country, local non-profit organisations have effectively used social audits as a tool to expose corruption and malfeasance in the implementation of NREGA. As we describe later on in the report, the state government of Andhra Pradesh has created a particularly effective system of institutionalized audits of NREGA. (Right to Food, 2005)

### **16.1.3. Financing**

All wages along with 75% of the cost of materials under NREGA is borne by the central government with state governments required to make up the shortfall. State governments are also required to pay unemployment allowance in the case that demand for work cannot be met.

## **17. Appendix C – NREGA in Andhra Pradesh**

States vary greatly in terms of the systems and processes they have adopted to implement NREGA. The systems and processes in place for implementing NREGA in Andhra Pradesh are described below:

### Initiation of New Worksites

The process of initiating new worksites begins with the Gram Panchayats sending a list of potential new worksites to the sub-district<sup>45</sup> office each month. The list of potential new worksites is reviewed by the Sub-district Parishad Development Officer (MPDO), the government appointed official with overall responsibility for implementation of all anti-poverty schemes at the Sub-district level, who approves or rejects each work based on the overall budget available<sup>46</sup> and whether the type of work is allowed under NREGA guidelines. In the case of an approved project, a sub-district technical officer visits the future worksite and creates detailed estimates of the number of workdays required for completion of the project.


At the time of publication of this report, a local newspaper reported<sup>47</sup> that the Andhra Pradesh government, under pressure from large farmers who are complaining that NREGA is causing wages of

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<sup>45</sup> In Andhra Pradesh, sub-districts are referred to as “sub-districts.”

<sup>46</sup> While the NREG Act stipulates that the amount of employment available should be driven solely by the demand of rural households, in practice officials ration budgets for NREGA among the various local villages under their purview.

<sup>47</sup> <http://www.eenadu.net/homedisplay.asp?qry1=StateNews&qry2=1&qry4=16&qry3=16>



farm labour to rise, is planning on implementing NREGA “work calendars” with scheduled blackout periods for peak agricultural seasons. A local official we spoke to in Karimnagar confirmed this report and added that the calendars would be drafted by local bureaucrats and leaders from among the farm and labour communities. However, it is still unclear whether this plan will in fact come to pass as it clearly violates the spirit of the NREG act.

### Management of Worksites

Within each village, all NREGA worksites are supervised and managed by a single field assistant. Field assistants are responsible for not only supervising the completion of work at worksites, but also for informing local villagers when work is available and maintaining details on muster rolls and job cards. Reporting directly to the field assistants are “mates,” regular NREGA labourers who often have relatively high literacy levels and who provide support to field assistants and other labourers. Field assistants in NREGA were, until recently, paid 1200 rs per month plus a small bonus based on the number of workers field assistants supervise each week but this sum was recently raised to 2200 rs per month plus bonus. Mates are paid the same as daily wage labourers.

At the end of each week, field assistants hand over muster rolls for each active worksite in their villages to the local sub-district office which in turn enters the information into a custom designed information system, transfers the data to the district office (and, in some cases, FINO or A Little World, another technology provider) and print out individual pay slips containing details of work completed and wages due for each worker. (The systems used for paying NREGA employees and SSP beneficiaries are described in more detail below.)

### Oversight

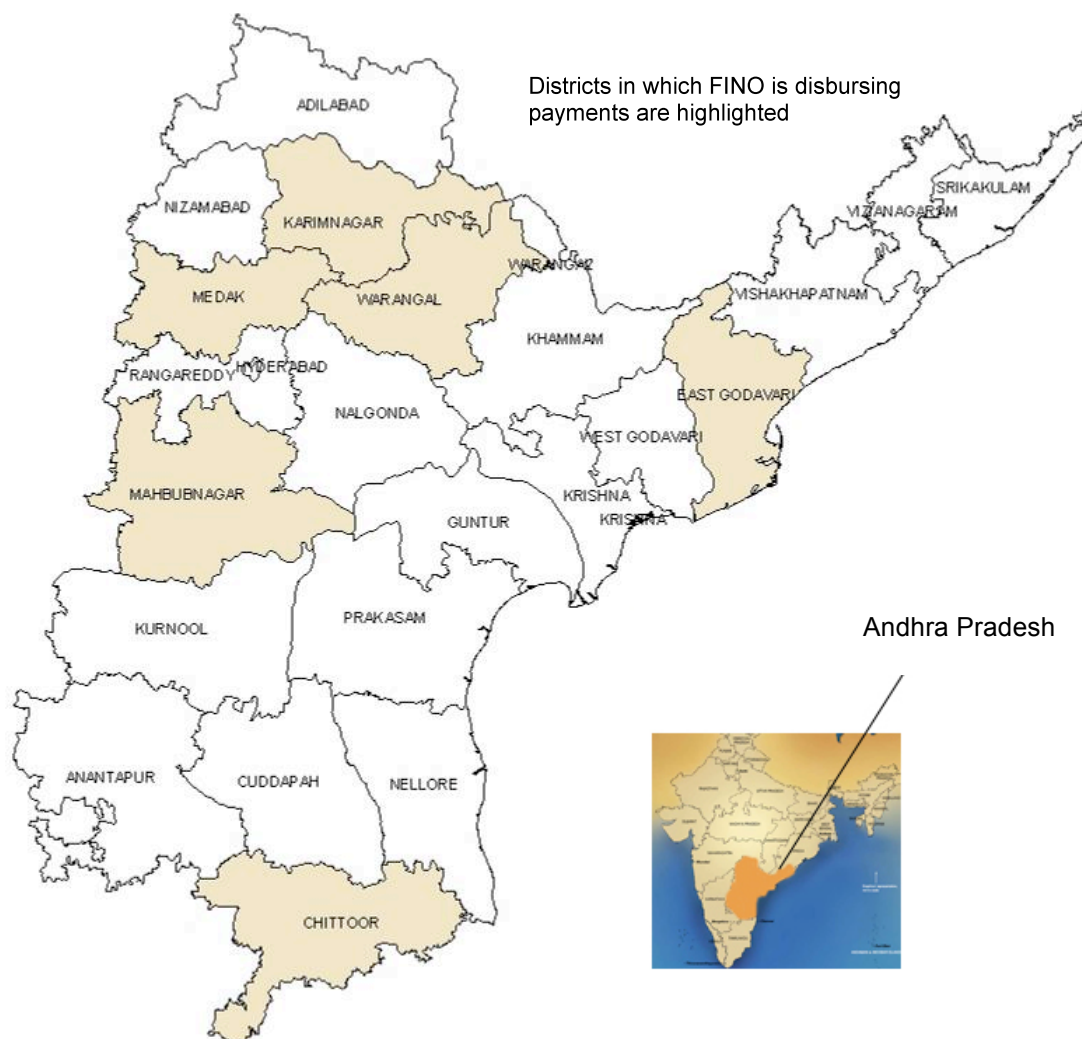
To ensure local level compliance with norms and regulation and to minimize corruption and other malfeasance, the state government of Andhra Pradesh, in collaboration with the Centre for Good Governance, has created an independent agency, the Strategy, Performance Innovation Unit (SPIU), to perform routine audits of NREGA in each sub-district.

Audits are conducted by specially trained SPIU staff who visit randomly selected NREGA workers to verify that official muster roll information matches the details recorded in the workers’ job cards and the workers’ own memories. Results from the audit are reported at a public hearing held at the local sub-district office and attended by local official, top district officials, and the media. In this hearing, the general public is allowed to voice grievances with the program and, in the case that any malfeasance is brought to light, district officials may take immediate steps to punish wrongdoers.

In theory, local “vigilance committees” within each Gram Panchayat also provide oversight of NREGA projects. In practice, these committees have little power and have proven almost completely ineffectual.



## 18. Appendix D – Map of Andhra Pradesh



## 19. Appendix E – Breakeven Calculations

The table below illustrates a sample breakeven calculation for an average village in the baseline case that there is no change to government requirement that NREGA wages be routed via bank accounts and average days worked per NREGA worker is equal to 55. *The analysis below is only suggestive in nature and some costs may be inaccurate*

Cost / Benefit	Amount (in rupees)	Amount (in dollars)	Formula used
<b>Up front costs</b>			
Equipment used to conduct enrollment	375	8.15	(Total cost of equipment for enrollment kit) / (# villages that an enrollment kit can be used for)
Fee to contractors for conducting enrollment	6000	130.43	(Average total # beneficiaries per village) * (fee to contractor per beneficiary enrolled)
Fee to IBM for checking for fingerprint matches	50	1.09	Assumed to be 50
Smartcards and smartcard customization	37500	815.22	(Average total # beneficiaries per village) * (total cost of cards including customization)
POT device	25000	543.48	Assumed to be 25000
CSP training	520	11.30	(Daily wage of FINO field staff) * (# days required to train CSPs)
<b>Total</b>	<b>69445</b>	<b>1,509.67</b>	
<b>Yearly Recurring Costs</b>			
Delivery of cash to CSPs	5814.1	126.39	(Yearly salary of FINO field staff) / (# villages 1 staff can deliver cash to) + (cost of petrol) + (cost of insuring cash)
CSP salary	9270.45	201.53	(CSP base salary) + .25%[(avg # NREGA workers per village)*(avg days worked per year)*(avg daily wage) + (avg # SSP pensioners per village)*(yearly SSP pension amount)]
POT servicing	250	5.43	Assumed to be 250
General overhead costs (including IT)	1000	21.74	Assumed to be 1000
<b>Sub-total</b>	<b>16334.54</b>	<b>355.10</b>	
<b>Yearly Recurring Revenue</b>			
1.75% of all transaction value	39693.15	862.89	1.75%[(avg # NREGA workers per village)*(avg days worked per year)*(avg daily wage) + (avg # SSP pensioners per village)*(yearly SSP pension amount)]
<b>Sub-total</b>	<b>39693.15</b>	<b>862.89</b>	
<b>Net recurring revenue</b>	<b>23358.61</b>	<b>507.80</b>	
<b>Pay back period</b>	<b>3.0</b>	<b>3.0</b>	

Notes:



Due to the fact that each CSP disburses payments for all beneficiaries in a single village<sup>48</sup> all analysis is conducted at the village level. The following inputs and assumptions were used to estimate the yearly profitability of FINO's operations in a single sample village (sources, where applicable, are listed in parentheses):

*Inputs:*


1. The total cost of a single enrolment kit is 75,000 rupees (around \$1600)
2. Enrolment teams are paid 8 rupees (\$0.17) per beneficiary enrolled.
3. FINO staff responsible for delivering cash to CSPs are paid 6500 rupees (\$141) per month.
4. CSPs are paid 300 rupees (around \$6.50) plus .25% of total amount disbursed as commission per month.
5. FINO is paid 1.75% of total amount disbursed as commission. In the case that the requirement that NREGA wages be routed through banks is lifted, FINO would be paid 2% of the total amount disbursed as commission.
6. The cost of a single POT is 25,000 rupees (\$543.48).

*Assumptions:*

1. On average, there are 650 NREGA workers and 100 SSP pensioners per village. (FINO, Government of Andhra Pradesh)
2. The actual ratio of NREGA workers to SSP pensioners in a village is the same as the overall ratio of target beneficiaries provided by the government. (Government of Andhra Pradesh)
3. Participants in the NREGA program work 20 days a year on average. (In fiscal year 2006, the average number of days per worker was 10. Anecdotal accounts suggest that the total number of workdays completed has doubled since then.) (Government of Andhra Pradesh)
4. Average daily wage in NREGA is 80 rupees (around \$1.74). (Government of Andhra Pradesh, interviews with beneficiaries)
5. Each FINO staff person can deliver cash to 30 villages each week. In the case that the requirement that NREGA wages be routed through banks is lifted, each FINO staff person could deliver cash to 45 villages each week. (FINO and author's own estimate)
6. The total cost of a single smartcard, including the cost of customization, is 100 rupees (about \$2.17). Since July, the RBI has agreed to subsidize the distribution of smartcards by paying FINO 50 rupees for each card. Thus the total cost of single smartcard to FINO is 50 rupees (\$1.08).
7. (FINO)
8. Each enrolment kit can be used for approximately 200 villages. (author's own estimate)

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<sup>48</sup> Each CSP actually disburses payments for a single Gram Panchayat. In most cases, there is only one village per gram panchayat but in the case of very large or small villages, a single gram panchayat may include more or less than one whole village.

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9. General overhead costs are approximately 1000 rupees (\$21.74) per village per year. (author's own estimate)
  10. Costs for servicing POTs are approximately 250 rupees (\$5.43) per POT per year. (author's own estimate)
  11. Fees to IBM for checking for matching sets of fingerprints after beneficiaries have been enrolled is 50 rupees (\$1.09) per village. (author's own estimate)

## **20. Appendix F – Additional Government Benefits which Could Potentially be Delivered via the Smartcards**

During our meetings with FINO staff and government officials, three additional government services were proposed for delivery via the smartcards: RSBY, the Public Distribution Scheme, and recording of NREGA worksite details. In the section below, we describe these government programs and assess the potential for the existing smartcard payment system to be leverage to deliver benefits for these other government programs.

### **20.1.1. RSBY**

In 2007, the central government announced the launch of a major new subsidized health insurance scheme for poor households, the Rashtriya Swasthya Bima Yojana (RSBY). In a first of its kind move, the central government simultaneously mandated that state must implement RSBY through the use of smartcards and smartcard readers installed in all participating health care facilities in the initial program legislation. Shortly after the creation of the RSBY scheme, the government of Andhra Pradesh announced its intention to be one of the first dozen or so states to implement the scheme.

Yet while RSBY seems at first glance like an ideal candidate for delivery via the existing FINO payment system, as of this report's release (November, 2008) it appears unlikely that the government of Andhra Pradesh will be able to use the smartcards distributed for NREGA and SSP for delivery of RSBY due to the type of operating system used by FINO cards. While the initial RSBY legislation did not include details about what types of cards may be used for RSBY (except to say that all such issues would be decided by the National Informatics Centre), the Ministry of Labour, which oversees implementation of RSBY, subsequently stipulated that only smartcards with a SCOSTA compliant operating system could be used for implementing the program. There is still a chance that the National Informatics Centre will overrule the Ministry of Labour's requirement, but experts interviewed for this report found this unlikely.

The RSBY episode illustrates the clear need for the central government to specify standards for smartcards in government programs well in advance.



### **20.1.2. Public Distribution Scheme**

An even more ambitious additional use of the smartcards would be to employ the smartcards to track purchases from the Public Distribution Scheme (PDS), a vast network of shops which sell goods such as rice, wheat and kerosene at highly subsidized rates to poor households. Currently, purchases from PDS stores are tracked entirely using paper based methods which has resulted in notoriously high levels of corruption. The Ministry of Consumer Affairs and Public Distribution has estimated that 31% of rice and 36% of wheat allocated to the PDS are lost to leakage (Ministry of Consumer Affairs and Public Distribution, 2002). Recently, the states of Haryana and Chandigarh have initiated pilot programs using smartcards to track PDS purchases in an effort to increase the transparency of the program.

It is not yet clear whether simply introducing the use of smartcards is enough to combat the endemic corruption in the PDS network. Andhra Pradesh and other states will be keenly watching the events in Haryana and Chandigarh to determine if they too should move to a smartcard based PDS system. If these exercises prove successful, it is likely that the FINO cards could be used to implement such a scheme. The overlap between NREGA beneficiaries and those eligible to purchase from PDS stores is most likely extremely high. Further, as states enjoy a great deal of autonomy in implementing PDS stores, it is unlikely that situation like what happened with RSBY, in which the ministry dictated that only a certain type of smartcards could be used to implement the program, would be repeated.

### **20.1.3. Recording NREGA worksite details**

Smartcards could also potentially be used for recording work details at NREGA worksites. Workers would carry the cards to the worksites each day, and the field assistants or mates would swipe workers' cards and enter in daily work details using the point of transaction device. Worksite data could be automatically uploaded to a central server without the field assistant having to carry the paper muster rolls to the sub-district office. Both ALW and FINO have worked on developing such a solution.

If implemented properly, such a solution holds great potential to reduce leakage by making it more difficult to fraudulently add names of “ghost workers” to muster rolls, to cut the amount of time required to deliver wages, and to improve efficiency by cutting out manual data entry of muster rolls. Yet, such a system would also likely face heavy resistance from field assistants and even workers if it limits their ability to pad amount of work reported. Intransigent field assistants could very well sabotage the system by intentionally damaging the POT device or feigning ignorance with regard to its usage.