

Feasibility Study for SMS-enabled Collection and Delivery of Rural Market Information

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Executive Summary

This study assessed the feasibility of using SMS technology to collect and disseminate agricultural market information to improve the profitability of small farms and rural enterprises.

Several international case studies of SMS-based Market Information Services (MIS) were reviewed. The MIS are typically made up of multiple partners generating multiple information products that are disseminated through multiple media channels, of which SMS is one. Most MIS are operated with private sector involvement but only one was reported to be financially self-sustaining from user fees. Increases in farm income resulting from improved information access are generally reported as very high (ranging between 5% and 400%).

In Cambodia, the current market information flow is through market players (widely accessible but potentially biased) or through government agencies and NGOs (limited in accuracy, frequency, consistency, and dissemination speed and outreach).

A survey of potential information users conducted for this study found that farmers have higher expectations for data accuracy than a MIS can realistically deliver. Also, there was no strong indication that market information would improve their farm gate prices in the short-term. Nevertheless, a number of longer-term benefits to improved market information were identified including greater market transparency, improved competitiveness, and opportunities for farmers to improve their crop selection and management practices over time.

The dramatic increases in short-term profits observed in some international cases are not likely to occur in Cambodia due, in part, to relatively high levels of market integration (i.e., little price difference between marketplaces) and collector competitiveness in Cambodia. The lack of an immediate return for farmers makes it unlikely that they will show a high willingness to pay for MIS. The weak demand, in turn, means that there is little incentive for private enterprises to develop and provide MIS solely for fees.

The study examines a variety of options for product mix, collection and dissemination methods, and financing models. From this, the recommended business plan is a public-private partnership comprising a private firm to manage core operations using data collected primarily by the government's Agricultural Marketing Office and with support for promotion and farmer capacity building from the Department of Agricultural Extension and NGOs. Dissemination may be further facilitated by Public Call Booths and Internet Information Centres currently under development with GTZ and others. Coordination with the CIDA-funded Cambodia-Canada Agriculture Market Information Project (CAMIP) is also recommended.

The most likely candidates for the private partner are the major telecommunication companies. They have a long-term interest in expanding their rural client base and may be willing to provide MIS as a way to sign up new clients even if the MIS does not generate a profit itself.

Recommendations are also made for a pilot project in a limited geographic area to test the SMS-MIS concept and monitor impacts on farm incomes.

1 Introduction

Small farmers and agricultural enterprises in rural Cambodia face a wide range of constraints that limit productivity and profitability. Among these is a lack of market information for commonly grown crops and livestock. They must often settle for incomplete, out-dated, and/or biased information when making business decisions including what, when, and how to produce crops and livestock and when and where to sell their agricultural goods. This increases risk and reduces profits for small farms and rural enterprises.

The growing availability and expanding service areas for mobile telephony in rural Cambodia presents an opportunity for improving the effectiveness and reducing the costs of information sharing. Short Message Service (SMS) text messaging, in particular, provides a simple, low-cost means of sending and receiving alphanumeric data, which could be adapted for the collection and dissemination of agricultural marketing information.

This study assesses the feasibility of a market-driven system for collecting and disseminating relevant agricultural market information using SMS technology to improve the profitability of small farms and rural enterprises.

The study has been commissioned and funded by the GTZ Private Sector Promotion Program (GTZ-PSP) and conducted by International Development Enterprises (IDE). The analysis is based on 1) secondary information from relevant reports and data, 2) primary information gathered from contacts with other organizations with relevant activities, and 3) primary data gathered from field surveys of potential information users.

Expected Results and Deliverables:

1. Identify and review relevant reports and data sources.
2. Identify and describe existing rural market information initiatives of NGO, bilateral, and government agencies and evaluate how an SMS-based system would fit in.
3. Provide an analysis of the existing value chain for agricultural market information in rural Cambodia.
4. Describe specific business cases that demonstrate how market information can profit small farmers and rural enterprises.
5. Assess demand and willingness-to-pay for agricultural market information for potential data users.
6. Describe and assess conceptual business model options including product description, revenue models, operational strategies, technical feasibility, etc.
7. Assess business interest and cooperation of potential telecom partners.

2 International Experience

On a global level, Torero and von Braun (2005) point out the opportunity for Information and Communication Technologies (ICT) to contribute to development goals and specifically to improve public service delivery in health (e.g., through “telemedicine” centres), education (e.g., through “virtual universities”), and agriculture (e.g., through the provision of information about agricultural technologies and prices). They caution, however, that these services often do not reach the poor in the short-term and that innovation is needed to improve access by the poor. They further assert that benefits from ICT depend on a balanced emphasis on *connectivity*, *capability*, and *content*. This implies the need to match the development of communication infrastructure with the development of know-how among the poor and the generation of information that is relevant and accessible to the poor in terms of subject matter, language, and format.

A recent study by Souter et al. (2005) on the use of telephony in rural areas found a number of consistent themes in India, Mozambique, and Tanzania (the consistency of themes lead them to suggest that the results may be broadly applicable in many developing world contexts). In the study areas, telephones were considered by users to be most important for emergencies and social networking while broadcast media were valued more for obtaining general information. Phones were considered of low importance for gathering information on issues such as farming, business, and education compared to face-to-face communication, which was by far the preferred method. In addition, richer and better educated people were more likely to experience financial gains from phones than the poorer, less educated, or more marginal members of society who tended to value phones more for saving money (e.g., by replacing travel or postage) than for earning money. To the extent that the same attitudes prevail in rural Cambodia, these findings suggest that the dissemination of agricultural information through telephones may be contrary to methods preferred by farmers for obtaining such information. There is also the potential for widening the gap between poorer and better-off people if the latter are in a better position to profit from the information.

With specific regard to the use of SMS technology to deliver agricultural market information, there is a growing body of experience in Asia and Africa from which to draw lessons. A number of these cases are included in Appendix A and summarized in Table 1. All or most of the cases reviewed shared the following characteristics:

- Partnerships between multiple players (government, private service providers, farmer groups),
- Multiple information products,
- Dissemination of information through multiple media channels (print, radio, TV, SMS, internet),
- A mixed variety of financial models including combinations of subsidy and user fees. Only one system (Philippines) was reported to operate sustainably on user fees alone, and
- Mostly anecdotal evidence of farmer benefits with limited reference to rigorous impact assessments.

In general terms, the Market Information Services (MIS) described in the case studies may be illustrated by the generic model presented in Figure 1. The generic MIS comprises a data collection function, a telecommunication company (telco), a system manager, and information users.

Figure 1: Generic Model of an SMS-based Market Information Service

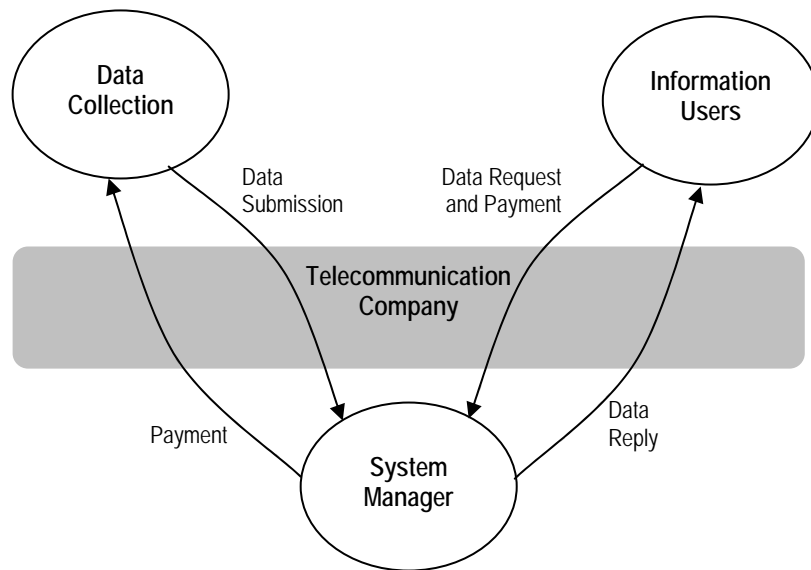


Table 1: International Experience with SMS Delivery of Market Information

Country	Senegal	Senegal	South Africa
Project name	Xam Marsé (or "Know your Market")	Manobi	Makuleke Pilot Project
Agency	Manobi, Sonatel	Manobi, Fishing Unions, Alcatel & Sonatel, IDRC	Vodacom
Year started	2001	2003	c. 2004
Project Objective	Agricultural Market Information Service providing real-time information via SMS messaging.	Innovative Internet and wireless e-services for the strengthening of Senegalese fishermen artisans	Test cell phone technology that gives small farmers access to national markets
The client	Rural (illiterate) growers of fruit and veg. (originally) but now also traders, hoteliers, housewives, etc.	Rural poor fishing communities	100 farmers
The product	Accurate real-time market prices. Info-data in databank at Manobi Telecom	Fish market prices and weather reports updated in real-time; fish stock info; boat departure times and estimated return times (for safety).	Market prices, trading
Collection	Manobi employees collect data from 10 markets using Psion PDA connected to mobile phone, then transmitted (WAP) to central database.	Data collectors record market prices in each of three markets using Psion PDA connected to mobile phone then transmitted to central database.	Existing price information uploaded to system
Dissemination	Manobi prepares data for access by WAP enabled phones, by SMS and website. On WAP, graphic icons are provided for the illiterate. Training is provided in use of SMS and WAP phones.	Manobi prepares data for access by WAP enabled phones, by SMS and website. On WAP, graphic icons are provided for illiterate users. Training is provided in use of SMS and WAP phones.	Web-based trading platform via Internet-enabled phones or request prices via SMS
Financing	Subsidy by Alcatel as a way to sign up rural customers before their competition. Alcatel initially discounted cell phones. Moderate fees apply for a data call by WAP or SMS.	Alcatel initially discounted cell phones. Moderate fees for WAP or SMS data.	Sponsored by Vodacom to expand rural market
Indicators of success	40,000+ customers. Farmers check prices prior to negotiating with traders who in the past had offered distorted prices. Dramatic income improvements quoted for some farmers (up to 400%). Relations between producers and traders has improved and become more productive.	Enabled quality and revenue improvement (freshness, less waste) by alerting buyers beforehand of catch, return time and place. Supports livelihoods and improves safety of Senegalese fishermen. Monitoring by Fishing Unions and telcos	Profits boosted by at least 30%
Other comments	Plans to expand service to South Africa, continental Africa, and the Middle East.	Project is now owned by the Fishing Unions who use fish-catch data for policy advocacy to prevent over fishing and management of fish stocks.	

Table 1 (continued)

Country	Philippines	Uganda	Kenya
Project name	B2Bpricenow.com	FoodNet	SMS Sokoni
Agency	Philippines Landbank, Government, Philippine Rural Reconstruction Movement (PRRM)	FoodNet (a marketing and agro-enterprise network for East and Central Africa); Min. of Trade, Tourism, and Industry	Kenya Agricultural Community Exchange (KACE) in partnership with Safaricom Ltd.
Year started	2001	c.1998	1997
Project Objective	To enable farmers to harness the benefits of info. & communications technologies to promote economic devt. & social well-being.		Provide linkage between sellers/buyers, importers/exporters; market information and intelligence to improve competitiveness; exchange trading floor
The client	Farmers, fisherfolk, small entrepreneurs.	Framers, Farmer's Associations, traders, processors, development agencies, policy makers	Farmers
The product	Transparent and timely market prices. Product tracing brokerage service (via website)	daily prices, 32 commodities, 4 Kampala markets; weekly prices, 28 commodities, 19 national markets; localized market services through local radio (local market opportunities, info on collective marketing strategies)	Commodity prices in different markets; who buys and sells what commodity where; extension messages
Collection	Data collected by co-ops phoning and talking to farmers. Data stored with cooperatives and on central database (maintained by Unisys) and uploaded to website.	Agents collect daily or weekly data, collate, and relay back to FoodNet.	Prices updated daily
Dissemination	Market info available via SMS polling and electronic bulletin board. Promoted mainly by PRRM and the Landbank.	12 FM radio stations in 8 languages, mobile phones, e-mail and internet for higher-end clients	SMS through two mobile telephone companies
Financing	Service free in initial years. Now self-financed thru fees for SMS access and online transactions.	Subsidized through USAID funding	User pay (portion?)
Indicators of success	Has helped farmers increase their revenues and lower their costs, making better crop choices and broadening customer base. Expanding and setting up partnerships with PC and cellphone companies to cover more of the country and reach more farmers cooperatives	7 million people per week access the information. Farmers consider market information to be their second highest priority after roads. Helps farmers negotiate with traders and receive 5-15% increase in farm gate prices	n/a
Other comments	Now endorsed as the official e-market place of the Philippines for agriculture and fisheries sector by Philippine Senate AND Official e-market place of Asia Pacific Rural & Agricultural Association.		Limited data available from KACE website

3 Current Situation in Cambodia

3.1 Flow of Market Information

Market information in the agricultural sector in Cambodia reaches farmers through one of two routes: through the value chain and through external agencies.

Through the value chain

- Price information is passed between market participants, e.g., from exporter to wholesaler to collector to producer.
- Information may be biased since the transmitter of information is participating in the transaction.
- Producers can check prices through alternative sources such as neighbours or their own market visits.
- The flow of non-price information in the value chain is less common and limited in extent and quality, e.g., new seed varieties and guidance for using commercially available technologies such as pesticides.
- At the downstream end of the value chain (exporters, wholesalers, collectors), cell phones and face-to-face exchanges are common media for sharing information. At the upstream end (producers, collectors), face-to-face exchanges are the primary means of communication.

Through external agencies

- Government agencies and NGOs that train farmers and provide information.
- Primary focus has been on (a) information for producers with little or no attention to other market players in the value chain, and (b) information on production techniques with little to no attention to marketing information.
- Price information is theoretically unbiased (although not necessarily accurate) since the information agent is outside of the transaction.

3.2 Local Experience

Existing Market Information Services

A number of agricultural MIS initiatives are currently active in Cambodia and these are summarized in Table 2. These systems currently collect price information on a regular basis but with limitations in:

- data accuracy,
- consistency between data collected by different agencies,
- number of commodities for which data is collected,
- number of markets from which data is collected,
- frequency of data collection,
- speed of information dissemination, and
- number of information users reached.

CAMIP

The Cambodia-Canada Agriculture Market Information Project (CAMIP), a four-year CIDA-funded project, is the most significant agricultural market information initiative currently active in Cambodia both in terms of resources and scope. CAMIP is currently nearing the end of its project formulation stage. As a donor preference, the project design was restricted to

working within existing government structures to the exclusion of potential private-sector approaches. It remains to be seen whether this is a detrimental limitation or not.

CAMIP is based in the MAFF Agricultural Marketing Office (AMO) and works with the AMO to improve agricultural market information collection and dissemination, and the MAFF Department of Agricultural Extension (DAE) to improve farmers' ability to use the information. The following project description and objectives are from the draft CAMIP Project Implementation Plan (Ypma, 2006).

The implementation of the project will be organized into two components. The first component will focus on improving the already existing agricultural MIS in all its phases, from data collection to information dissemination, including improved extension processes. The second component will focus on how to use market information in market development. Component 1 of the project will focus on all commodities in the existing AMO MIS, in all eleven provinces in which AMO is active. Component 2 will, in the first year, start in two provinces and then cycle through the remaining provinces for the duration of the project. CAMIP has opted to highlight only fruits and vegetables as commodities for Component 2 to narrow the focus to the agricultural products with the highest requirement of market information.

CAMIP hierarchy of objectives:

To improve agricultural stakeholders' ability to access, gather, analyze and use information to better respond to market signals.

- *Improved productivity and income for Cambodian farmers*
 - *Increased access by farmers, including men and women, to relevant and timely market information.*
 - *Enhanced capacity of AMO, provincial offices and DAE to assist farmers in understanding and using market information.*
 - *Increased capacity of farmers, including men and women, to understand broad market issues affecting their production choice, including grade standards, quality, cost of production, etc.*
 - *Increases ability of farmer, including men and women, to use market information to make improved production choices.*
- *AMOs and provincial offices have assumed ownership and responsibility for continuous management and operation of agricultural marketing information services.*
 - *Established relevant and reliable agricultural MIS, managed and implemented by AMO and up to eleven provincial offices.*
 - *Increased coordination among departments and provinces handling market information, resulting in increased stakeholders' ability to plan and make informed decisions.*
- *Increased capacity of Cambodian institutions and organizations to provide agricultural marketing services to farmers.*
 - *Increased capacity of AMO, provincial offices, DAEs and other relevant groups in the provision of marketing services.*
 - *Increased farm-to-market linkages through enhanced capacity of producer groups, collector-traders and advanced farmers to provide marketing information services to farmers.*

Table 2: Summary of Current MIS Initiatives in Cambodia

Agency	MAFF	Ministry of Commerce	Catholic Relief Services (CRS)	CEDAC
Project name	Agricultural Marketing Office	Domestic Trade Department	Agriculture Program in Svay Rieng	Market Data Service – “Farmer Magazine”
Year started	1997		08/2005	2002
The client	PDAFF, agencies, farmers	Govt institutions, firms registered with MoC, PDoC, embassies, farmers	Commune farmers growing cash crops (rice, veg,) and livestock (chicken, pig).	small commune farmers growing cash crops (soya, veg, rice) and livestock (chicken, pig)
The product	Prices - retail (some), wholesale (mostly), and intl. 52 agricultural commodities from 30 markets in 11 prov. plus Phnom Penh	Prices - retail (mostly), wholesale (some), and intl. 50+ agricultural and non-agricultural products from 23 prov. plus Phnom Penh	Local Svay Rieng market wholesale and retail prices, Bulletin and radio info-service from Svay Rieng office.	Packaged monthly, soon bi-weekly in magazine format – data plus informative articles.
Collection	15 field staff collect market data 2x per week and send to AMO HQ. Analysis limited to price trends. No forecasting. International prices sourced from internet	70 staff Information sourced from markets and internet	Local network of individuals collect data each Monday and submit spreadsheet to local coordinating office in Svay Rieng. Data stored locally and copied to PP-HQ Weekly data compiled and monthly price trends issued	Local network of individuals collect PP market data and submit hand-written to PP head-office for analysis and presentation. Also local rural network collects end of value chain price data man-to-man. Rural and PP data is analysed and filed (hard & soft copy) at PP-HQ Weekly data used for issuing monthly trends in data sheet format and for magazine content.
Dissemination	Bulletins to PDAFF and agencies, few private persons Daily radio to farmers	Bulletins to PDoC local and overseas embassies, few private persons Radio and TV to farmers	Compiled data sent by local CRS office to national CRS offices, Govt. depts, local NGOs. Market data made available to the farmer community by radio broadcast (24 hrs later) while paper bulletin is issued 48 hrs later. Presently internal promotion in coordination with MAFF and MoComm.	CEDAC head-office provides data Farmer Magazine sold for 100R to rural farmers and 1000R to NGOs. Promotion via own network of data collectors.
Financing	Subsidized by FAO and ADB Agricultural Support Program		CRS 50% / MAFF-RPRP 50% Talks underway with MoComm and MAFF to find ways for continuing financial support.	NGO subscriptions, donations, proceeds from farmer sales cover ~40%. Remainder subsidized by CEDAC project funds.
Indicators of success	Study in 1998 indicated 62% of farmers found broadcast price information helpful.		Survey of randomly selected farmers in 35 villages showed 79% knew market prices. Of these, 90% received their data via the radio reports.	Annual independent evaluation indicates that farmers use the magazine in the provinces where it is available.
Other comments	Source: after Hundley (2004)	Source: after Hundley (2004)	Operator finds that rural farmers prefer the daily radio broadcasts but that local SMEs prefer to wait for the hard-copy bulletins Direct operating expenses ~\$10K p.a.	Offers cooperation and assistance of its data gathering network. Aim is to provide a weekly market data bulletin in the long term.

3.3 Survey of Potential SMS Market Information Users

A qualitative survey of potential SMS market information users was conducted by IDE field staff from May 22-26, 2006. The main objective was to assess demand for SMS-enabled market information services among potential users.

Market players from several sub-sectors in two provinces were surveyed. To select these provinces and sub-sectors, IDE ranked a range of possibilities based on the estimated number of rural small-scale market participants (and therefore the potential market size represented) while aiming to achieve diversity in sub-sectors and geographic location.

In each province, a team of three surveyors conducted interviews with relevant market participants including producers, collectors, wholesalers, processors, and exporters. Informants were identified through non-random opportunity sampling by talking with people in market centres. Informants often recommended other relevant people to interview. An interview guideline (Appendix B) was used to provide direction for the surveyors but discussions with informants ranged freely.

In total, 96 informants were interviewed including

Producers	47
Collectors/wholesalers	26
Processors	17
Exporters	6

Survey results are summarized in Table 2. Conclusions are presented below:

- Most respondents showed a strong interest in the proposed SMS marketing information service.
- Producers, collectors, and processors want the proposed service to provide reliable and accurate data (they want to know that the reported price is the price that they will get at the market).
- Wholesalers and exporters were less enthusiastic about the system as they already have means to obtain market information and currently enjoy an advantageous position because of it.
- Some producers expressed a belief that better information would help them to obtain higher prices but they were not clear about how this would happen. Other producers felt that price information would not help them in price negotiation.
- Price information was deemed less useful for commodities that had highly fluctuating prices like perishable vegetables (because the price changes from time of reporting to time of selling) and those that had highly stable prices like pigs (because price is less time sensitive and could be obtained from other sources)
- At least half of the producers have access to cell phones.
- Market participants are familiar with cell phone technology but not with SMS.

Table 3: Summary of Field Survey Results

Sub-sector	Peanuts, mung bean, soy bean, sesame	Green leafy vegetables	Pigs	Poultry
Survey location	Province Kampong Cham Districts Steung Trang Chamkar Leu Kampong Cham	Province Kandal Districts Kean Svay Saang	Province Kandal Districts Kean Svay Dey Eth	Province Kandal Districts Ang Snoul Rusey Keo
Current info sources and channels	Collectors, wholesalers, and exporters contact each other by cell phone to share market info. Farmers, collectors, and processors meet and talk directly to receive market info	Farmers get info from local vegetable collectors and neighbor farmers 70% of growers sell veg through collectors, and 30% sell direct to the wholesalers in the market.	100% sold pigs through middlemen/pig slaughterers from O Rusey or Koki market. Price info received from slaughterers and neighbors that sold pigs previously	80%-90% sold their product through CP (animal feed company) and loan providers Most poultry raisers have agreements with CP/loan providers to selling the products to them The price according to CP and market situation Other info mostly through existing mobile phone
Strengths of current system	Can negotiate on prices directly Can receive information every time	No cost for information	Accurate and reliable info if received from a close neighbor No charge	
Weaknesses of current system	The info is not reliable Farmers lack alternative info sources to support their price negotiation There is a risk in their business	Price information is not very accurate or reliable (get lower prices) Price always change by collectors Collectors sometimes transfer price risk to farmers. They agree on a purchase price and receive goods without immediate payment. If they get a lower actual price at the market they pass on the loss to farmers but if they get a higher price they keep the extra gain for themselves.	The price info received from middlemen/ slaughterers is low and cannot be negotiated Inaccurate scales High expenses on feed and small profit	

Sub-sector	Peanuts, mung bean, soy bean, sesame	Green leafy vegetables	Pigs	Poultry
Perceived benefits of an SMS-based market info service	<p>More reliable price info</p> <p>Can provide fast info.</p> <p>Cost of requesting/obtaining info may be less</p> <p>Can provide more business options</p> <p>Will help farmers and collectors in buying and selling decisions</p> <p>SMS can still work in weak cell phone coverage areas where voice does not work.</p> <p>Help smallholders in case of some traders taking advantage of info asymmetry</p>	<p>Accurate</p> <p>Quick. Save time.</p> <p>Can obtain higher prices</p>		
Perceived problems with an SMS-based market info service	<p>Worry about info will not clear and not reliable</p> <p>Worry about where they can buy or sell the products at the same price range as indicated by SMS-info system</p> <p>Lack of technical skill to use SMS system</p> <p>Difficult to read or listen SMS system because of physical handicaps</p> <p>There is less benefit for wholesalers and exporters</p> <p>large businessmen not happy because they will have less chance to take advantage of an market interest on smallholders.</p> <p>At the same time, SMEs are also worry about quality of info data that they will get through SMS system.</p>	<p>Pay money</p> <p>Language</p> <p>Price different from market (in market price always change up and down)</p>	<p>Pay money</p> <p>May be difficult to use</p> <p>Prices may not be accurate</p> <p>English language</p> <p>Regardless of posted price, the real price depends on face to face price negotiations between buyer and seller/slaughterers.</p> <p>Pig prices do not vary much. 5000 to 5200 riel/kg year round. Limited risk in timing of pig sales. Limited usefulness of rapid price info</p>	

Sub-sector	Peanuts, mung bean, soy bean, sesame	Green leafy vegetables	Pigs	Poultry
Interest in SMS system	<p>Willing to pay approximately 300-500 Riels per inquiry</p> <p>Cost of SMS system should not exceed the calling cost per minute</p> <p>Want the new market-info system is established soon and run it for long time – sustainability</p> <p>Estimate number of producers that would use the system ~ 75%</p>	<p>90% of farmers are interested on using SMS info system, and if the collectors accept the veg prices via SMS the farmers believed that they will increase theirs in come</p> <p>Cost of SMS: farmers willingness to pay from 300 Riel to 1500 Riel for using SMS info per time</p> <p>70% think they could use SMS (if SMS wrote in Khmer language and provided technical training to them).</p> <p>50% want to hear voice and 50% want to see in Khmer text</p>	<p>Farmers willing to pay from 300 to 1500 Riel per inquiry</p> <p>Most (~80%) farmers would use the system only when selling a pig. Some (~20%) might use it more frequently.</p>	<p>Most are not interested in prices because they know already know the prices from the market</p> <p>Only ~30% would use SMS</p> <p>Willing to pay 500 riel in per inquiry</p>
Current phone use	<p>Farmers who have their own phone ~50%</p> <p>Collectors ~95%</p> <p>Wholesalers and exporters: 100%</p> <p>Processors ~45%</p> <p>Each village has public phone from 2 to 5 places</p> <p>Calling cost is 300-500 riels per minute</p> <p>No SMS service offered at public phones</p> <p>100% of public phone owners know how to check their phone account</p> <p>Difficulty in using text message because they don't have English</p> <p>100% of crop players choose or like to use the text message instead of voice mail</p> <p>100% of crop players like and use Mobitel</p>	<p>70% of veg grower households can access mobile phone</p> <p>100% of them never use SMS to receive or sent the text message</p> <p>90% of farmer using mobitel (012)</p>	<p>Have never used SMS but could learn if in Khmer and have guideline how to use it</p> <p>Most know how to use a voice phone already.</p>	<p>80% have access mobile phone but have never used SMS</p>

3.4 Survey of Rural Phone Access

IDE conducted a survey of randomly selected rural villages in order to estimate the level of access to mobile phones. To gather the data, a series of five questions was “piggy-backed” onto another survey that IDE was conducting for a separate project.¹

A total of 27 rural villages were selected using proportional sampling (chance of a village being selected increases with village population) from three provinces: Kandal, Siem Reap, and Svay Rieng. The three provinces were selected non-randomly to be broadly representative of the country in terms of socio-economic status. Village level data, including information on telephone availability, was collected by interviewing the village chief and other knowledgeable people in the village and from village records. The survey was conducted in March 2006.

The following statistics are for rural villages:

- On average, there is one phone for every 13.4 households (or 0.075 phones per household)
- There is no strong correlation between number of phones and distance from the provincial center
- There is at least one publicly available phone in 48% of villages
- The modal price for phone usage at public phones is 500 riel/minute
- None of the publicly available phones offered a text messaging service
- 93% of villages are within the 012 coverage area
- 63% of villages are within the 011 coverage area
- 41% of villages are within the 016 coverage area

Mobile phones appear to be widely available in rural Cambodia. Evidence and observation external to this study indicate that mobile phone access continues to grow rapidly. The service area covered by Mobitel (prefix 012) is the largest of the telecoms operating in Cambodia, reaching more than 90% of all surveyed villages.

4 Utility of Market Information

4.1 Information Needs and Limitations

It is important that an MIS be responsive to the needs and demands of users, especially if they will be expected to pay for the service. We need to ask who needs information (market segmentation), what information do they need, and how will they benefit from the information?

A wide range of market information is potentially useful to farmers and rural enterprises in making management decisions. Useful agricultural information is not limited to prices but includes weather forecasts, best practices, new varieties, demand forecasts, quality standards and definitions, information about market channels, crop selection, pest and disease diagnosis, soil analysis and fertilizer recommendations, among others. Dutta (2005), for instance, identified the following key information gaps facing horticulture growers in Siem Reap and Banteay Meanchey:

¹ *Demand Assessment for Sanitary Latrines in Rural and Urban Areas of Cambodia* for the World Bank Water and Sanitation Programme (WSP).

- Absence of knowledge on crop specific soil conditions and seed selection.
- Inadequate knowledge on pest management complicated by inferior and poorly labelled seeds, fertilizers, and pesticides.
- Absence of proper knowledge of seed, fertilizer, pesticide and other agricultural input prices.
- No proper or adequate information on credit sources or credit formalities.
- Lack knowledge on fruit tree industry and new plantings of fruit trees.
- Lack knowledge on post-harvest, storage, transport, and handling technologies.
- No clear market channel information.
- Insufficient and inadequate market information.
- Lack of business, marketing, and entrepreneurship skills resulted in high risk aversion by farmers.
- Lack of knowledge on quality standards and no self-regulating mechanism in place.
- Insufficient farm-to-market extension services.

There are, however, practical limitations to the type of information that can be effectively transmitted using SMS technology.

- **Khmer Script.** Khmer script is not currently available for SMS messaging. Although advances in the development of Khmer Unicode script will make it possible to use Khmer letters in the near future, this will be limited initially to new Nokia cell-phone model phones with supporting software. It is expected that at least one of these will be a low-cost model targeted at a poorer market segment. Nonetheless, Khmer script will not be available for older model mobile phones that are common in poorer rural populations. This constraint may become less of a concern over time (5-10 years?) as Khmer-enabled phones filter out to rural areas. This has been the case in Thailand and Vietnam where the introduction of affordable cell-phones enabled for local script has been eagerly received, thus prompting Nokia, which commands about 80% of the cell-phone market in Cambodia to provide a similar option for this country.
- **Message length.** A maximum of 160 characters can be sent and received through SMS.
- **Literacy.** Literacy levels in rural areas are relatively low especially among women. Complex written information would not be accessible to many people.

For these reasons, SMS is best suited to the delivery of short, simple messages encoded in numbers, short text, or icons. This effectively rules out the delivery of complex technical information that would traditionally be delivered through training, booklets, manuals, etc. (An exception to this rule may be in the combination of SMS with other media such as SMS prompts informing users of a relevant training opportunities or TV/radio programs). Furthermore, the characteristics of SMS and cell phone technology make it appropriate for transmitting time sensitive, dynamic

information. For these reasons, SMS is particularly well-suited to the delivery of price information.

4.2 Price Information

Different sources of price information fall along a continuum of accuracy and reliability. At one end, the truest price information that a farmer can obtain is the actual transaction price that is negotiated between her/himself and the buyer (i.e., a collector at the farm gate or a wholesaler at a marketplace). Somewhere near the other end of the continuum is price information from a MIS such as the one being considered by this feasibility study, which cannot practically take into account factors such as distance, small variations in quality, the relationship between the buyer and seller, and rapid supply- and demand-driven price variations. Between these extremes, trusted neighbors who have recently negotiated prices for themselves can report price information that is richer in detail and similar to what the farmer may expect to obtain her/himself.

Because a MIS does not, by its very nature, report “true” prices, the value of such systems lies in their consistency. This need for consistency suggests that it may be detrimental to have multiple price information reporting systems operating in parallel since each system is unlikely to report precisely the same information leading to confusion and mistrust among the information users. This would merely result in competing systems while undermining its most valuable feature—consistency (Ypma, 2006).

Given a consistent source of market price information, there are a number of ways that producers can use the information to improve their profitability (after Shepard, 2002):

- Reducing information asymmetries. When market price information is widely known, and all market participants know that others participants know the prices, then there is a disincentive to underpay or charge inflated margins as doing so would damage ongoing relationships between buyers and sellers. Widely available information increases transparency and competition, serving to keep market participants “honest.”
- Estimating farm-gate prices. Over time, farmers will be able to correlate reported prices to the prices they actually receive if the reported prices are collected in a consistent manner at a consistent standard of crop quality. To facilitate this, farmers would benefit from an improved understanding of costs incurred by collectors, which accounts for the difference between farm gate prices and reported prices.
- Short-term trend awareness. In general, producers are price-takers. The only time they are in a position to negotiate prices is when there is a shortage of good quality and they have multiple buyers vying for their produce. By following price trends, producers can be aware when such a situation is developing.
- Long-term trend awareness. By tracking and comparing commodity prices over several seasons, farmers can identify crops and quality grades that are likely to be profitable in future and can make production plans accordingly. They can also identify times in the year when prices are highest and adjust their planting times accordingly.

- Long-term management tool. If farmers know that they consistently get lower than average prices for their crop, this can be a trigger to find out why. Is it related to variety, quality, timing, or other issues that they can manage better in future crops?

IDE Field research concluded that the usefulness of price information varies between crops and is related to the frequency at which prices fluctuate. Prices for highly perishable vegetables can vary significantly over short time periods (hours or minutes). When traders arrive at the market with a load of cabbage, for instance, they set their price on the spot based on a visual evaluation of the competition. As the supply of cabbage increases or decreases the traders decrease or increase their price accordingly. Price information reported at 6:00 am may no longer be valid at 7:00 am and is thus of limited value to farmers for making short-term sales decisions. Other commodities such as live pigs vary little over long periods (months) and thus farmers have little need for rapid access to recent prices. The maximum utility of price information is for commodities that fluctuate over periods of days or weeks. The level of price fluctuation of a commodity is largely related to perishability, storage options, and whether it is primarily a subsistence or cash crop.

During IDE field research, many farmers and producers expressed great interest in the proposed SMS market information service. A primary expectation of such a system, however, is that it deliver accurate and reliable information. Farmers want to be assured that the reported price is the price that they will actually receive if they go to the market. As indicated previously, however, a MIS cannot promise to deliver price information that is highly accurate for all users. Thus, a challenge will be to clearly communicate the nature and limitations of the reported data and to educate and modify the expectations of potential information users.

Another factor affecting the utility of market price information is the level of market integration, i.e., the degree to which surpluses and deficits in marketplaces are resolved through transfers of goods between marketplaces. Efficient transfer between markets limits price differences to the cost of transportation between markets and reduces the potential advantage to farmers of informed marketplace selection. In Cambodia, the level of integration appears to be high but the issue warrants further study (Ypma, 2006)

Most of the international MIS cases (Section 2) noted that improved access to price information resulted in improved negotiating power of small producers and higher farm gate prices. This is in contrast to several opinions in Cambodia (e.g., Hundley, 2005 and Ypma, 2006) and the field survey conducted for this study (Section 3.3), which suggest that small farmers have few options, are primarily price-takers, and that better market information is not likely to have a large impact on short-term price negotiation outcomes. The dramatic results reported in some of the international case studies (up to 400% profit increase in one case) thus seem unlikely in the Cambodian context. This may be attributed to differences in level of market integration and collector competitiveness, which appear to be higher in Cambodia.

5 Business Plan Options

Tables 4 and 5 below outline a range of options for key components of an MIS business plan: product, collection system, dissemination system, and financing.

Table 4: Options for MIS Product Offerings

Product options	Details	Clients	Pros (+) and Cons (-)	Capacity Building Requirements
Wholesale purchase prices	Prices that wholesalers pay to collectors at market centres. Important variables to decide: - range of commodities, - frequency of collection, - number/location of markets. Need consistent data collection protocol and quality definitions	Relevant to traders, processors, and farmers that grow a significant portion of their crops for cash sale	+ Useful for producers + Information already collected by several agencies - Quality and consistency of data needs improvement	Basic use of cell phones and SMS Basic literacy and numeracy (applicable to all product options) Nature of price information (limits to accuracy). Understanding collector costs How to use data: - to estimate farm gate prices - to track price trends - for crop selection - to improve crop planning and management
Retail purchase prices	Prices paid by retailers. Same variables and conditions apply as above	Useful for consumers and some producers who sell directly to retailers	+ Information already collected by several agencies - Less useful for producers who sell to collectors - Quality and consistency of data needs improvement	As above
Trade volumes	Volumes of produce traded in market centres. Same variables and conditions apply as above	Relevant to traders, processors, and farmers that grow a significant portion of their crops for cash sale	+ Useful for supply/demand forecasts - Not currently collected at any markets. - Expensive to collect without controlled market entry points and standard load sizes.	How to use data to improve crop selection, planning, and management
Flood forecast	Water levels at various Mekong River locations	Relevant to both subsistence and commercial farmers	+ Data already collected by MoWRAM and posted on Mekong River Commission website	Correlating reported levels to extent of local flooding Understanding forecast probabilities

Product options	Details	Clients	Pros (+) and Cons (-)	Capacity Building Requirements
Weather forecast	Long-term and short-term forecasts	Relevant to both subsistence and commercial farmers. Especially useful at key production points (planting, fertilizing, irrigating, harvesting)	<ul style="list-style-type: none"> + Data already collected by MoWRAM - Access to data? - Insufficient precision for local areas - Unreliable forecasts may reflect badly on MIS - TV is a better medium 	Understanding forecast probabilities
News headlines	Headlines from Khmer newspapers on topics of agriculture, economics, business, development, etc.	Relevant to both subsistence and commercial farmers (depending on news content)	<ul style="list-style-type: none"> + Data already collected by media company (e.g., MC&D) - Available for Khmer-script phones only - May need to avoid political news in current climate 	None
Media prompts	Announce time and station of relevant broadcasts on radio and TV or other events	Relevant to both subsistence and commercial farmers (depending on program content)	<ul style="list-style-type: none"> + Complementary media can provide comprehensive information coverage - General information only, not location specific, supply driven (push, not pull) 	None
Market support	E.g., market channels, quality standards, storage/packaging/transport	Relevant to traders, processors, and farmers (both subsistence and commercial) depending on content	<ul style="list-style-type: none"> - Complex information - Relatively static, long shelf-life - Other media more appropriate for detailed information + Condensed "tips" could be sent to Khmer-script phones 	None
Management support	E.g., credit sources, input supply prices and suppliers			
Technical support	E.g., pest/disease control, best practices, new technology			

Table 5: Options for Business Plan Components

Data Collection	Details	Pros (+) and Cons (-)
Parallel system	Establish a separate data collection system in parallel with existing systems. Collection agents stationed at market centres submit regular data.	<ul style="list-style-type: none"> + Greater control over collection variables and conditions - High cost to establish and maintain data collection system - Inconsistency between various systems
Aggregation from multiple agencies	Act as a service provider to assemble and transmit data collected by other agencies	<ul style="list-style-type: none"> + Maximize commodities and regions covered - Inconsistency between various systems - Cost to manage multiple relationships
Aggregation from single agency	Act as a service provider to transmit data collected by a single agency.	<ul style="list-style-type: none"> + Better control over data quality and consistency + The same effect would be achieved if data collection agencies agreed to consistent collection protocols and standards - Fewer commodities and less area covered
Data from market participants	Solicit, assemble, and transmit, information directly from market participants (e.g., traders, wholesalers)	<ul style="list-style-type: none"> + Possible lower data collection cost (but need to factor in cost of managing relationship with multiple collection agents) - High potential for problems with data quality, consistency, bias
Data Dissemination	Details	Pros (+) and Cons (-)
User initiated data polling	"Pull" strategy. Users request and receive data directly from database	<ul style="list-style-type: none"> + Demand driven + Targeted, meets specific user needs - Users need access to polling codes for commodity types, market location, etc.
SMS broadcast	"Push" strategy. SMS broadcast to predefined list of recipients (e.g., subscribers)	<ul style="list-style-type: none"> + Reach many people at one time with information of general interest - Users need to register/subscribe (limits distribution) - Supply driven - Not targeted
Internet posting	Create a website to post market information	<ul style="list-style-type: none"> + Opportunity to present more complex information, access archived information, etc. - Users limited mainly to institutions and large market players + IICs (described below) could potentially extend reach to smaller market players and farmers - Cost of creating and maintaining a web site

Public call booths (PCBs)	PCB operators are supplied with list of polling codes. SMS information access becomes an additional product that they offer to their clients.	+ PCB operators can help promote the service and educate users + GTZ and others are working to develop PCB concept – Final number, locations, operational details of PCBs is not yet known. Viability not yet demonstrated.
Internet information centres (IICs)	IIC operators are supplied with list of polling codes. Access to market information becomes an additional product that they offer to their clients (either through SMS or internet)	+ IIC operators can help promote the service and educate users + GTZ and others are working to develop IIC concept + Creates more access to internet data posting – Final number, locations, operational details of IICs is not yet known. Viability not yet demonstrated.
Combined media	SMS initiates connections with other media (voice phone, TV, radio)	+ Complementary media can provide comprehensive coverage of information – General information only, not location specific, supply driven (push, not pull)
Financing	Details	Pros (+) and Cons (–)
User pay	The information user pays for the service on a per-inquiry basis or through subscription fees	+ Communicates value of market information + Cost recovery – Limited willingness/ability to pay among potential users
Subsidized	System is subsidized by public funds (government and/or donors) as a public good.	+ Market information is a legitimate public good + Facilitates information access for the poorest farmers – Information may be seen as having little value by potential users – ongoing financial support for subsidies is not certain
Cross subsidization	Higher-margin products for more affluent market segments subsidize the agricultural MIS for poorer rural clients. Products may include entertainment (horoscope, sports scores, lottery numbers, movie listings), business (gold prices, currency exchange rates), etc.	– Incentive to concentrate on profitable market segments and neglect agricultural MIS (less of a problem for a social enterprise) – Cost to develop and promote high-margin products – Some telcos are already providing similar services
Alternative revenue	Advertising Sale of archived data (raw or processed) to other agencies (research institutions, NGOs, etc.)	+ New mode of communication for service providers – Farmers increase awareness of service and product offerings – Graphic ads can be sent to non-Khmer script handsets – Nuisance factor of unsolicited ads – Question of data ownership and right to sell.

6 Conclusions and Recommendations

In consideration of the foregoing discussion and analysis, we make the following recommendations for an SMS-enabled rural MIS.

6.1 Players and Incentives

There are no strong indicators that farmers and rural enterprises in Cambodia can reap large short-term gains as a result of improved access to market information (e.g., by negotiating higher farm gate prices or selecting between market destinations). The lack of an immediate return for farmers makes it unlikely that they will show a high willingness to pay for information services. The weak demand, in turn, means that there is little incentive for private enterprises to develop and provide market information services solely for fees.

On the other hand, there are significant medium- and long-term benefits (e.g., increased market transparency and competitiveness, improved crop planning and management) that are likely to result from improved access to market information as market players gain experience and capacity over time. The long-term developmental benefits provide a strong rationale for subsidized provision of market information as a public good. However, a public good does not necessarily require public delivery and the subsidized market information may be delivered more effectively and efficiently by a private enterprise in a public-private partnership arrangement.

Since the prospect of user-fee revenue is low, the private partner in such an arrangement would need an alternative incentive to participate. One option is to merely contract (through an appropriate bidding process) the private firm as a service provider to deliver information on behalf of the public data collection agency. This is not likely to be sustainable in the long term as it requires the public agency to cover the delivery cost and forfeits the advantages of a more demand-responsive system. A preferable option is to identify a private partner that has an interest in connecting with the rural population. For instance, a company seeking to develop or expand the rural market for its main product or service may be willing to support a MIS in order to recruit new customers even if the MIS does not generate profit itself. Such companies may include agricultural supply companies and telecommunication companies (telcos), with the telcos being the most promising possibility at present (see Appendix C for further discussion on potential telco partners)

The SMS-MIS should rely on existing data collection and information extension agencies and should not attempt to establish parallel systems. Cooperation agreements should be established among the system manager, telcos, data collection agency, and dissemination agency(ies).

Price information should be obtained from a single collection agency (not multiple agencies) in order to promote and maintain consistency of price information. To achieve the greatest coverage area, the price data should be sourced from either the MAFF-AMO or the MoComm-DTD.

Information gathered for this study indicates that cell phone access in rural areas is relatively high with one in 13 rural residents owning a phone and public phones available in one of every two rural villages. The outreach of the SMS-MIS would be increased by cooperating with Public Call Booth operators (both existing and those

being developed by GTZ and others) and Internet Information Centres (existing and those being developed by GTZ and others).

The development of the SMS-MIS should be closely coordinated with the CAMIP project, which is tasked with increasing the capacity of the MAFF-AMO and improving information dissemination.

A summary of potential actors for the various roles in the business plan are presented in Table 6 below.

Table 6: Potential Actors for Business Model Roles

Function		Potential Actors
System Manager		Existing private enterprise with an interest in connecting with the rural population - Telco - Ag input supplier
Data collection	Price data	MAFF-AMO MoComm-DTD
	Flood data	Mekong River Commission MoWRAM
	Basic data analysis	MAFF-AMO MoComm-DTD
	News headlines	Media firm
	Extension messages	Dept. of Agricultural Extension NGOs
	Extension tip-of-the-day	Dept. of Agricultural Extension NGOs
	Media prompts	Media producer or broadcaster
Telco		Mobitel 012 Camshin 011 Samart 016
Dissemination		NGOs Public Call Booths Internet Information Centres Dept. of Agricultural Extension Market authorities
Promotion and capacity building		NGOs Dept. of Agricultural Extension

6.2 Product Offering

Development experience and research indicates that goods or services provided free of charge are valued less by recipients than those that require an investment on the part of the user. Thus, even for a subsidized MIS, a nominal fee should be charged for the data in order to screen out recipients that have no intention of using the data and to encourage users to learn how to use the data for maximum gain. In the case of the SMS system, the fee may be equivalent to the normal SMS charge.

A more advanced level of information could be offered to those farmers and rural enterprises that are ready and able to make better use of market information. Advanced level information should be offered at a price that covers actual delivery costs including profit margins.

Capacity building of information users will be a critical aspect of the development of the SMS-MIS. High-quality, user-friendly, graphic-rich materials should be developed to instruct users on how to use the service and provide the codes for polling data. Cooperation agreements should be established with NGOs and the DAE and ToT

training should be provided to their staff to help promote and build capacity among farmers. A number of NGOs contacted during this study expressed interest in incorporating an SMS-MIS service into their agriculture programs. It is likely that many NGOs would do so at no cost to the SMS-MIS provider if provided with appropriate promotion/information materials.

SMS should be one in a mix of media used to deliver market information to farmers and rural enterprises (e.g., TV, radio, printed bulletins, internet).

The recommended initial product mix is shown in Table 7 below.

Table 7: Recommendation for Initial Product Mix

Information service level	Basic service	Advanced service
Fee	Nominal fee Cost of SMS message deducted with each inquiry	Full cost recovery Monthly subscription deducted from cell card account
Handset requirement	Available on all phones	Available only on Khmer-script phones
Method of access: <ul style="list-style-type: none"> • User polling using published codes 	Price data available by commodity and market Mekong flood forecast	Price data available by commodity and market Basic data analysis (e.g., short term and long term price trends, significant market differentials) Mekong flood forecast News headlines (agriculture, business, development, etc.) Extension messages
<ul style="list-style-type: none"> • SMS broadcast 	n/a	Regular updates of subscriber-specified crop prices Media prompts and announcements Extension tip-of-the-day

6.3 Risks

Risk issues related to the development of an SMS-MIS should be monitored during implementation:

- Trust is a critical factor in the adoption of new technologies. This is particularly so in the communication of market information, which has traditionally involved face-to-face exchanges for most farmers. Care must be taken to project a trustworthy image and to not damage trust with poor, unreliable, inconsistent, or inaccurate information.
- The ongoing availability of public funds required to maintain the subsidized components of the information service (e.g., data collection) presents a risk to any private enterprises involved in service delivery. This can be mitigated by effectively measuring and communicating the benefits of the MIS to increase commitment among decision makers, and by ensuring that private partners do not depend on the SMS-MIS as their sole source of revenue.

6.4 Pilot Project

A pilot project to test the SMS-MIS concept in rural Cambodia should be considered. We make the following recommendations regarding the pilot project design:

- Each of the major telcos (Mobitel, Camshin, Samart) should be approached with an offer to participate in the pilot.
- The offer should include i) a description of benefits for the telco including increased SMS usage/revenue, development of their rural market, and positive public relations; and 2) GTZ's contribution including assistance with development of the product/process, pilot project management, and monitoring. A sample telco presentation is attached in Appendix D
- The telcos should be approached separately but at the same time, giving each the opportunity to be the first-mover. No guarantee of exclusivity should be given.
- Select one telco partner that shows the most interest and is willing to contribute their own resources to the pilot project.
- Work with CAMIP and a technical specialist (perhaps available within the telco) to set up the required information systems including data collection, upload to database, database management, and SMS polling.
- Identify and work with an NGO partner that has community-based agricultural development projects to promote the SMS-MIS among target farmers and build their capacity to access and use the information effectively.
- The pilot project should cover a limited geographical area that lies within the NGO partner's target area and the telco partner's coverage area.
- Project monitoring should include system functionality, satisfaction of system users, and changes in income experienced by system users and non-users both before and after accessing market information.

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Appendix A: International Case Studies

Receiving market prices by SMS

Daniel Annerose and Emile Sène describe Manobi's 'Xam Marsé' and how the life of one Senegalese farmer has been transformed by a mobile phone.

'Xam Marsé', or 'Know your market', is the Wolof name for the agricultural market information system (MIS) developed and operated by Manobi, in conjunction with Sonatel, since 2001.

With Xam Marsé, Senegalese farmers, traders, hoteliers or housewives can now receive real-time information via SMS messages on their mobile phone, or the web, on the prices and availability of fruit, vegetables, meat and poultry, on any of Senegal's markets.

Seydou Ndoye, a farmer from Keur Abdou Ndoye, a market town in the Niayes region of western Senegal, was one of the first users of Xam Marsé. After using the system for four years, his experience demonstrates that farmers can make use of innovative ICT solutions to secure their own economic and social development. The market at Keur Abdou Ndoye is a centre for the sale and distribution of fruit and vegetables, and is where local farmers and itinerant traders (banas-banas) gather to do their deals. 'Before I started using Xam Marsé, I was forced to accept the prices quoted by the banas-banas, because I had no information about the real value of my produce', Mr. Ndoye says. 'During the first season I used the system', he explains, 'I quadrupled my net income from about 1.5 million to 6 million CFA francs' (1000 CFA francs = €1.5).

How has he been able to do this? 'I just check the market prices of products on my mobile phone, and I set my prices for the banas-banas depending on the actual market value, which I now know better or just as well as the people I deal with', replies Mr. Ndoye.

Farmers, even those who are illiterate and have never used a phone, can master the technology within a few days. For a small service fee, subscribers to Xam Marsé are making full use of the accurate price information it provides in their negotiations with the banas-banas. Previously, they had little alternative but to accept the word of the traders, who usually offered prices distorted in their favour. As Mr. Ndoye recalls, 'The first day I used Xam Marsé, I had 200 40-kilo bags of cabbages to sell. Although the banas-banas offered to buy them at just 8500 CFA francs a bag, I was able to bargain and eventually sold them for 11,000 CFA francs a bag. On that day alone I was able to increase my income by no less than 500,000 francs. After that other cabbage producers came to me to ask about the information I was getting from Xam Marsé'.



The accurate information provided by Xam Marsé – a service that is not available elsewhere – is now accepted as a point of reference that all parties can trust. As a result, the relations between producers and the banas-banas have improved and their exchanges have become more productive.

Market opportunities

Mr. Ndoye has since developed new strategies to improve his business, and so increase his income even further. 'Once I had used the system for a few months, I learned how to gear my production to take advantage of new market opportunities. I decided to diversify my output by going into potatoes, fresh peanuts and green beans. I approached the local farmers' cooperative, and asked for a loan of 3 million CFA francs. I was able to pay off that loan the same year thanks to an excellent crop of 40 tonnes of potatoes, which I sold for 200 CFA francs a kilo. In the second year I increased my income to 17.5 million CFA francs', he says. 'I quickly reinvested some of the profit in a mechanized irrigation system, and bought five electric pumps costing 700,000 CFA francs each. It also enabled me to farm a new plot of land measuring 6 hectares and to start livestock breeding. I now have 15 head of cattle', he adds proudly.

While Mr. Ndoye is deeply happy of the business success he has achieved through Xam Marsé, he is equally proud of the social benefits he generates for him and his family. He enjoys receiving visitors and showing them his new farm equipment, as well as the solar-powered refrigerator and the television hooked up to a cable network. Mr. Ndoye, who cannot read French, but is good at figures, is especially pleased with the fact that for the last two years he has been able to send all his children to school, and that his eldest son is now a student at Dakar University.

Agricultural market information systems such as Xam Marsé are often discussed

from a technical or operational point of view. But success stories such as that of Mr. Ndoye provide the most simple and best illustrations of how ICTs can bring many economic and social benefits for farmers, and are now contributing to the development of agriculture in Africa.

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This project was first featured in ICT Update 9, January 2003



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MANOBI (Senegal)

www.manobi.net

Innovative Internet and wireless e-services for the strengthening of Senegalese fishermen artisans

Abstract

MANOBI's 'Innovative Internet and wireless e-services for the strengthening of Senegalese fisherman artisans' is a new project started in early 2003. This project uses WAP and SMS technology via cell phones to provide fishermen with up-to-date weather reports and market price information. In addition the fishermen are able to use the interactivity of the technology to input fish stock information for marketing purposes, and to log their departures and estimated times of return, so that local fishing unions can be alerted if fishing boats fail to return on time. At the time of writing some 57 individual users had registered for the service (41 buyers and 16 artisan fishermen).



Photo 1: Data collector in Dakar fish market

Background

This project was initiated in January 2003 by MANOBI, a private telecommunications company, in partnership with three local fishing unions, two telecommunications companies (Alcatel and Sonatel), and the Canadian International Development Research Centre (IDRC). Consultations were carried out with stakeholders, including the representatives of local fishing unions, at the beginning of 2003, to determine the information needs of artisan fishermen who typically earn 50,000 CFA (\$80)/month and 100,000 CFA (\$160)/month. It will be evaluated at the end of 2003 by a national steering committee who are interested in the opportunity to scale up the project nationally.

The project aims to support the livelihoods and improve the safety of Senegalese fishermen, by giving them access to up to date market prices, weather reports and other information services via cell phones using WAP (Wireless Application Protocol) and SMS (Short Messaging Service). The rationale behind this project is that at present the fishing sector represents 10% of Senegal's GDP and employs approximately 17% of its working population. Previous information system projects in the fishing sector tended to address the collection of information rather than its dissemination to users. MANOBI have already developed a similar scheme providing a platform of services for small Senegalese farmers growing fruit and vegetables. This service now has over 300 subscribers, and has enabled farmers to secure higher prices for their crops. The positive experience of this project coupled with the needs expressed by the fishermen artisans and interest from the national government encouraged MANOBI to look at carrying out a similar project for Senegal's fishing community.

The project began with an analysis of the needs of the fishing sector, as well as a financial and technical study for project design and implementation. From this the project was implemented beginning with the extension of the cellular network to the fishing regions. Through the MANOBI multi-channel gateway the project was able to produce the information in a form readily available to fishermen. WAP, as the main technology, was chosen because it allowed some interactivity, and

would allow fisherman and others to access a central database of information in real time. Finally the fishermen were trained to use the WAP network to retrieve the information they required.

The project has employed two data collectors who record the market prices in three locations in Dakar and Kayar. The information is collected using a ruggedised Psion computer, and is then transmitted by cell phone to a central database and web site. Market prices are updated in real time, enabling fishermen to find out the latest prices immediately they return from the sea. In some cases this has enabled them to land on a different beach in order to secure a higher price from middlemen. So far (by the end of July 2003), some 57 individual users had registered for the service (41 buyers and 16 artisan fishermen). The service requires users to buy a WAP-enabled cell phone (available locally for \$90 plus \$30 SIM card). Many fishermen already had cell phones (in order to contact their regular buyers). MANOBI estimates it takes around two minutes to access the data services, at an average cost of around 180 CFA (29 cents) a minute.



Photo 2: MANOBI provides market data to help both buyers and sellers of fish

A major success of the project was to persuade Sonatel to install a cell phone base station near the beach at Kayar in March 2003, which now provides cell phone coverage up to 14km from the shore (allowing fishermen to access the MANOBI data services while at sea). In addition the pilot services have enabled those fishermen with cell phones to log their departures and estimated times of return, so that local fishing unions can be alerted, via their extranet web site and SMS, if fishing boats fail to return on time. Combined with access to real-time weather reports, this has improved safety for artisan fishermen operating from the capital Dakar and the nearby town of Kayar. By recording detailed information about daily catches, the resulting database will also be a useful resource in monitoring fish stocks, which are being over-fished, in the immediate area.

When implementing this project MANOBI experienced a number of delays before pilot data services were first introduced in June 2003. For example, the project had to persuade the government meteorological office to share weather data publicly (previously weather reports were only made available to people within the administration, and for industrial fishing ships). It took time for Sonatel to install the cell phone base station at Kayar, without which the pilot would have been unable to function in that area. When collecting data about local species of fish, it was found that the same species was called different names by different ethnic groups. It also took time to develop simple recognisable graphic icons for the different fish (viewed by cell phone) to enable fishermen with low levels of literacy to use the service.

Impact/Results

Although it is early days, the pilot has demonstrated a way of giving artisan fishermen real time access to market data for their products. One of the fishing unions reported how the service enabled them to detect and rescue one of their members and their 8 man crew that had not returned on time. The service also potentially enables fishermen to improve the quality of their products: by alerting all potential buyers (middlemen) as soon as they have landed their catch, the fish can be sold while still very fresh. Typically up to 30 per cent of the catch of artisan fishermen may be wasted while the fishermen wait to find a buyer.

The project has also directly contributed to the extension of the mobile network of Kayar - a fishing town of 20,000 people during the high season.

Key Issues

➤ Partnership

The project has partnered with a number of organisations from both the corporate and civil sectors. In the initial phase close dialogue was maintained with the fishing communities and unions in order to design the most appropriate information service required. This dialogue also enabled MANOBI to investigate the willingness of future users to pay for the services being developed. The aim of this was to help MANOBI design a tariff structure in line with peoples ability to pay.

The fishing unions and telecommunication organisations involved in this project will be responsible for monitoring the project through a steering committee.

➤ Target groups

The project target groups are fishing communities within rural poor areas who use an identified five landing sites. This will include the fishermen and the women involved in fish processing and wholesale.

➤ Capacity building

The project has built the capacity of local artisan fishermen and their unions, by giving them access to weather reports, market data and other services. The project has helped them to present their needs to government, and to share information about fish catches on a transparent basis.

➤ Technology

The MANOBI service is accessible via the web, SMS, and by WAP enabled cell phones. While many fishermen already owned cell phones to contact their buyers, some have had to upgrade to get the WAP capability. ALCATEL has agreed to sell suitable cell phones to fishermen at a discounted rate. Sonatel has discounted the price of data calls (29 cents/min), compared to 37 cents/minute for voice calls.

➤ Finance

MANOBI	US\$139,920
Sonatel	US\$105,580
Alcatel	US\$ 88,420
IDRC	US\$ 31,800
Total project budget	US\$615,000
infoDev	US\$249,206



Photo 3: Updating the latest catch information to the MANOBI server.

Beneficiary Quotes

- Artisan fishermen Adama Diop has used MANOBI data services to support his own small business. *'It is a very powerful tool, which is changing the way we are working,' he says. The service allows the local professional organisations to monitor the different boats at sea: 'If we are one hour or two hours late returning, they can send an alert and try to help us.'*
- Pape Mbaye, who leads a professional federation of artisan fishermen, believes these data services have brought significant benefits for fishermen, improving both safety and revenue from sales. *'It provides real-time data about prices on the beach and volumes. It will help us increase our efficiency, and the revenue from this sector.'*

Issues and Lessons

Challenges.

The project faced a number of challenges at the beginning, which delayed piloting of the first data services until June 2003. These included delays by the local administration (e.g. to convince the meteorological office to share weather reports, and to develop a way of doing so); initial shortages of pre-pay SIM cards (supplied by Sonatel); language barriers between different ethnic groups (this has been addressed by creating graphic icons for different species of fish, suitable for use on WAP cell phones).

Key factors/issues, which have led to poverty reduction outcomes.

The project took time to involve a range of stakeholders: including government officers, fishing unions and telecommunications companies. The fishing unions (who can access data via a PC and dial-up modem from their office in Kayar) own the project, and want to use the fishing catch data collected to lobby for policies to prevent over-fishing in the region.

MANOBI Director Daniel Annerose comments that the comprehensive collection of data will help artisan fishermen in the future, especially as fish stocks are under increasing pressure from both local fishing, and from the large commercial vessels coming from Europe and other developed countries. It is the only detailed information that is publicly available, and can be used to help fishermen and their representatives present a strong case for protecting the natural resources on which the fishermen depend. *'Our platform can make this data available to government and the professional organisations who are managing this sector,'* he says.

Future outlook

The programme is currently preparing the way for a national programme through the use of a steering committee. This committee will evaluate the experience of the pilot study in order to come up with recommendations for a nationwide scheme. Their evaluation will focus on: the economic impact of the access to market price information on the income of fishermen and wholesale fish merchants; the degree of diffusion and acceptability by the population of the ICT equipment; and will assess the potential of other services using the same technology, e.g. health, e-governance etc. The evaluation will also identify if there is sufficient fee-based demand so as to cover most of the investment costs and all of the operating costs of content development. MANOBI hope to persuade Sonatel to boost the coverage of the Kayar base station to an expected 70km radius using Alcatel equipment, significantly widening the area of coverage.


Stakeholder Consultation



- **Manobi web site:** www.manobi.net
- **Manobi Grant Agreement** with *infoDev*, Aug 2002
- **Manobi Proposal Form** for *infoDev*, Jan 2002
- Interviews carried out by Mike Webb in August 2003 with:
 - Daniel Annerose, CEO MANOBI
 - David Boggio, Business Development, MANOBI
 - Adama Diop, Iba Diouf and Mar Mbaye, artisan fishermen
 - Diene Ndiaye, Fisheries Technician, Ministry of Fisheries
 - Abdel Kader Mboub, local consultant training artisan fishermen
 - Pape Mbaye, Bassirou Mbaye, Abdoulaye Diouf, Abdoulaye Diop: representatives of fishing unions
 - **infoDev Task Manager**, Paul Noumbaum

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News from the Mobile Communications Industry in South Africa

Hi-tech cell phones help Africans trade crops

www.mobileafrica.net

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Daniel Mashva heaves his sack of cabbages and sweet potatoes into a rickety shared taxi and travels nine hours under the scorching sun to the market in Johannesburg.

By the time he arrives, half his tiny harvest is rotten and the 48-year-old father of five returns to his impoverished village just a few pennies richer.

That was before new cell phone technology changed his life.

Mashva now dials up to a virtual trading platform on his new hi-tech phone and sells his produce direct from his small thatched hut on the fringe of the vast Kruger National Park.

"I check the prices for the day on my phone and when it's a good price I sell," he told Reuters from his village in the remote northeast of South Africa. "I can even try to ask for a higher price if I see there are lots of buyers."

Mashva is one of around 100 farmers in Makuleke testing cell phone technology that gives small rural farmers access to national markets via the Internet, putting them on a footing with bigger players and boosting profits by at least 30 percent.

"Mainstream farmers have access to market information so they can negotiate better prices. This cell phone enables poor rural farmers to get that same information," said Mthobi Tyamzashe, head of communications at South African cell phone operator Vodacom, which is sponsoring the project.

One of Mashva's neighbours said he had quadrupled his monthly income since using the phone, as he was now able to cut out a middle man who paid him far less than the market price for his cotton crop.

"Last year was really a disaster, I made around 800 rand a month and was having trouble feeding my family," Jeremiah Chauke told Reuters. "But last month I made around 4,000 rand -- that's a lot of bucks."

Chauke has invested some of that extra cash into growing vegetables on a small plot of land near his house, which he also sells using his phone.

INTERNET TO THE POOR

Like almost half of Africans, neither Chauke nor Mashva had made a phone call let alone surfed the web before receiving their new phones. But both are now hooked and deftly manoeuvre their hi-tech handsets with pride.

Cell phone use has rocketed 100 percent in the world's poorest continent since 2000, and the Makuleke scheme is one of many ways the technology is being used to tackle poverty.

Experts say wireless technology is also the best way to bring the Internet to the poor, mainly because inhospitable and sparsely-populated African landscapes mean rolling out landline infrastructure is not commercially viable.

Senegalese company Manobi, which operates on-line systems for businesses in the developing world, first launched the trading platform for farmers and fishermen in the west African nation, and says it has signed up 40,000 customers there.

"It's a trading platform and a business space," said Manobi Chief Executive Daniel Annerose. "Small Senegalese farmers even linked up with the French army (on the platform) last year and agreed to supply one of their ships when it docked in Dakar."

Manobi has teamed up with French cell phone manufacturer Alcatel (CGEP.PA: Quote, Profile, Research) and Vodacom (TKGJ.J: Quote, Profile, Research), to launch the project in South Africa, where it hopes 100,000 farmers will use the system if the Makuleke pilot project takes off.

After that, they want to push into the rest of the continent and the Middle East.

In Senegal, a team of Manobi employees collect 80,000 data from 10 markets per day and get it on line within a few seconds, while in the more mature market of South Africa the company simply uploads existing information onto their system.

Farmers can access the information on a web-based trading platform via Internet-enabled phones, or can request prices and make trades via SMS, or text message.

Local business like safari lodges and restaurants also have access to the platform so they can order

from farmers direct.

CHARITY OR BUSINESS?

Vodacom and Alcatel freely admit they do not sponsor projects like this out of the goodness of their hearts -- the aim is to expand the cell phone market into rural areas and to sign up new customers before the competition.

"The idea is that if people start off with your product they will stay with it once they become more profitable clients," said Vodacom's Tyamzashe.

Vodacom has provided 360 starter packs and airtime vouchers worth 300 rand each, while Alcatel has stumped up 200 handsets.

But the key question is whether farmers often living on less than a dollar a day be able to afford to surf the web on their phones once free airtime runs out.

Experts say projects like this are often hit-and-miss and that Makuleke may not turn out to be sustainable, but that it was important to keep trying ways of improving communications in rural areas of Africa.

"Individual projects like this may not be sustainable, but in a wider context it is an important part of getting telecoms out to the rural areas," said telecommunications expert Arthur Goldstuck, from research group World Wide Worx.

"It is a case of throwing all kinds of things at the wall and hoping that some of it works."

Mashva is optimistic his phone will generate enough extra cash to pay for the calls.

"I will get the money to pay for it when I sell my products," he said with a grin.

- South Africa

B2BPriceNow.com (Philippines)

www.b2bpricenow.com

E-Commerce for Farmers Hands-On Training Program

Abstract

B2Bpricenow.com is an e-marketplace in the Philippines. Through this on-line market place farmers, fisherfolk and small and medium enterprises can access market prices and trade products. This can be achieved either through their website or by cell phone. Split into two phases, the project began by obtaining content for the site from a variety of agricultural and fishery co-operatives and training them to both access and post products on the website. Through free technical support and hosting by Unisys, B2Bpricenow.com is able to offer its services for free. The second phase is focused on getting these groups connected to the internet and actual transactions occurring on-line.



Photo 1: a farmer checking prices via sms

Background

This project is the brainchild of Mr Edgardo Herbosa. The idea behind it was to set up an e-commerce web site whereby Filipino co-operatives and groups could trade their produce. Set up in 2001 with some of his own funds, Mr Herbosa received technical support from Unisys in exchange for company shares. The project was adopted by a number of government agencies, the Land Bank of the Philippines, the NGO Philippine Rural Reconstruction Movement (PRRM) both of which were thinking of setting up similar systems, and obtained funding for training from InfoDev. These partnerships have enabled B2Bpricenow.com to provide free access to the site for co-operatives and other groups.

The project objective is to '*enable farmers to harness the benefits of information and communications technologies to promote economic development and social well-being*'. It is hoped that by providing transparent and timely market information for both buyers and sellers, the project will enhance efficiencies in the agricultural market. In addition, the ability of the farmers to tap buyers and sellers directly and to obtain competitive prices for their inputs and outputs should result in higher incomes and in turn contribute to poverty alleviation.

The rationale behind the project is that farmers in the Philippines, particularly those in rural areas, have long suffered from lack of market price information as well as poor access to buyers and sellers. Consequently, they have been unable to get the best value for their produce and have usually relied on traders to serve as intermediaries and providers of market information. But the interests of the traders often conflict with the interest of the farmers - thereby putting into question the reliability of market price information and the fairness of the buying/selling prices negotiated between the farmers and the traders. In the past, this problem was addressed by cooperatives and government agencies who took a sample of prevailing market prices, two or three times a week, and then disseminating them by paper, a day or two later if requested. By such time, however, the prices were out of date and this system was not able to provide comprehensive price information throughout the Philippines' 7,100 islands. Moreover, there has never been a mechanism to allow farmers and cooperatives to market their products and trade directly with distant buyers and sellers, some of whom they have never even met beforehand. To address this B2Bpricenow.com provides a free electronic bulletin board and marketplace designed to bring relevant market information directly to farmers, primarily through their cooperatives. As an electronic bulletin board, the website enables users to benefit from greater negotiating leverage resulting from awareness of prevailing market prices for their products. As

an electronic marketplace, the website aims to minimize intermediation (middlemen's fees), thereby enabling the farmers to reap the gains of lower costs and broader market reach.

Project activities to date include the establishment of the website, the creation of website content, and a training/information road show presented in over 30 cities. In addition, 5 two-day workshops have been carried out in conjunction with PRRM. The training programme included 'how to use the computer' and 'on line basics'. Future trainings will include 'how to negotiate on line', 'how to canvass prices', 'how to contact buyers', etc. Currently project activities are focused on getting co-operatives connected to the internet in 1,500 municipalities through the establishment of the b2bcenters (business centers) at the cooperative premises.

This project contributes to poverty reduction in four ways: first, it helps farmers increase their revenues by getting competitive prices for their produce; second, it helps farmers lower costs by enabling them to communicate electronically with other cooperatives that have similar purchasing and marketing requirements; third, price and supply volume information aids the farmer in making their crop and other investment choices; and fourth, the site enables farmers to broaden their customer base and enables them to trade with each other.

An initial evaluation of project usage among participating co-operatives was attempted by the Land Bank using questionnaires. Unfortunately none of the questionnaires have been returned. However, B2Bpricenow is still in its formative stages and monitoring of actual transactions should be easier once the on line transaction gateway is launched in Autumn 2003.

Impact/Results

- Through the programme the target groups have gained access to additional marketing windows for their commodities. B2Bpricenow.com believes that the Internet is the ultimate playing field where farmers and fisherfolks can sell their commodities at prices that are not controlled by the middlemen. These middlemen buy the agriculture produce at a low price and sell the same at a higher price.
- Figures from August 2003 show that B2Bpricenow.com has 1967 businesses connected with their website, covering numerous sectors including agriculture, manufacturing, civil society organisations and government agencies. There were 1344 agricultural postings, 92 consumer manufacturing and 104 industrial manufacturing postings. However, no figures are currently available on the number of transactions made to date.
- The initial number of trainees attending five workshops was 248. However, the workshops attracted more than 2.5 times this number of participants. Of the people who had originally signed up 42 % were small entrepreneurs and an additional 20 % were farmers or fishermen.
- An estimated 1550 people attended the 31 trainings associated with the road show.
- 70% of Land Bank's co-operatives have been informed of B2Bpricenow, with 42% (1,600) trained in using it.

Key Issues

➤ Partnership



Photo 2: Receiving hands on Computer and SMS training on using the B2Bprice now website.

The primary partnering institutes are the Philippine Rural Reconstruction Movement (PRRM), are the Land Bank of the Philippines. PRRM is the country's oldest non-government organization, having been founded in 1952. PRRM has 14 field offices nationwide, and a workforce of 300 men and women and programs all dedicated to sustainable area development programs. PRRM and B2bpricenow.com have been working together for a year, having forged an agreement in 2000 (see website) whereby PRRM has committed to inform, educate, and where available, provide Internet access to cooperatives from their field offices. The Land Bank is a government-owned universal bank with a mandate to promote growth and development in the countryside. In addition to its regular financial assistance mandate, Landbank also provides cooperatives with technical assistance on matters such as marketing, trading, and provision of information on new technologies.

Through a partnership with the American based technology company, Unisys, B2Bpricenow.com have been able to reduce their high cost technical expenditures, such as programming and purchase of e-marketplace software, administration, maintenance, and hosting charges, which are now covered by Unisys. As a consequence of this B2Bpricenow.com is able to provide the marketplace for free. (Rimando, L)

➤ **Target groups**

The groups targeted by B2B are mainly farmers, but there are also fishermen and small entrepreneurs. Users from these groups tend to belong to cooperatives or people’s organizations, including advocacy groups. The PRRM partner groups are mostly rice farmers, rice-based food processors, and farm workers who are also micro-entrepreneurs. The Land Bank-assisted co-operatives are also agriculture-based but there are also small manufacturers and processors. One co-operative in Cavite is fishing-based, with very minimal incomes during the off-season.

Land Bank and PRRM have no statistics on the age range and gender of their co-operative members. However, they said that most members are between the ages of 35 and 60. As for gender, farmer co-operative members are usually men, whereas for small entrepreneur co-operatives the women usually outnumber men.

➤ **Capacity building**

By accessing information on prices, volumes, and identity of buyers and sellers, the farmers are able to negotiate and attain competitive prices for their products and purchasing requirements. At the end of the project, B2Bpricenow.com aim to educate and train farmers to use information and communications technologies in their day to day transactions.

➤ **Technology**

Desk top computers and telephone connections for 14 co-operative groups. In addition, internet cafes are currently being set up with the Land Bank that will use wireless technology to link them to the internet. The website and server has been developed and hosted by Unisys. Cell phones for accessing information through SMS.

➤ **Finance**

Project Funding:

Founders Initial capital for pre-operating expenses	\$ 40,000
Unisys Site design, programming and maintenance	\$360,000
Ating Alamin Advertising, broadcasting	\$ 40,000
Landbank Promotion and training (technical assistance)	\$132,000
Grant Request Training	\$118,000
Total	\$690,000

For the training events Landbank paid for the accommodation, the Department for Trade and Industry the food and venue, the Department for Agriculture lent the LCD projector, and the Department of Science and Technology the airfare. Ongoing costs are met through commission paid to B2Bprice now when people access the site through their cell phones and through on-line transactions. Other sources of income include local congressmen, co-operative websites and online adverts.

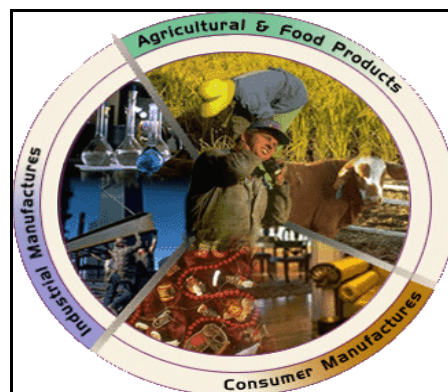


Photo 3: various aspects of the e-market place

Beneficiary Stories

- Ricardo Buenaventura, a rice farmer from Talavera, Nueva Ecija, has spoken of how having access to B2Bpricenow.com has helped him and his cooperative, Nagkakaisang Magsasaka. *"This trading venue enables us to monitor prices. We no longer have to travel far, going to a market place or trading center to do that."* From Electronic Market For Farmers By Lala Rimando <http://www.b2bpricenow.com/pr/WhatsB2B.htm>
- Through orientation training on B2Bpricenow.com, Maggie Monge of PRRM-CamSur has led her to encourage co-op members to participate in the roadshow training. In addition she noticed that the website showed demand for virgin coconut oil but no producer. This has prompted her to introduce the production of virgin coconut oil to the co-operatives.
- 9 young people from El Gancho Co-operative families have received B2Bpricenow.com’s computer training. Through this they are now able to use the computer provided to the co-operative by infoDev in helping their families monitor prices and to help with their school work.

Issues and Lessons

Challenges

- The main challenge has been one of finding the funds for the educational and technology costs. However, Unisys and InfoDev eventually met these.
- The main technical challenge has been telephone connections. For areas far from any telephone service B2Bpricenow are currently in talks with satellite and wireless technology companies. In contrast to most developing countries electricity connection rates are pretty high in the Philippines. However, at present B2Bpricenow will only expand their work to areas with both electricity and telephone connections, which has limited them to municipal centres and large settlement areas.
- A major challenge is making sure that cooperative members who attend the trainings keep up their skills.
- While B2B has focused on the internet, it has become obvious that mobile phones offer a greater opportunity for a relevant and useable service. Mobile or Cell phones are now common in the Philippines and text messaging (SMS) is particularly popular. Co-ops already get price data from local traders by phoning them. B2B offers a part of its service through SMS, and it is likely that this service will have to expand to match demand from the user co-operatives.

Key factors/issues, which have led to poverty reduction outcomes.

- Within the training component of the project, having three-participants per computer has proven more effective than a one participant per computer. This is due to the fact that three-participants will complement each other in the learning process while the one participant will have nobody to share what he experienced and has a tendency to get lost during the lecture. After the trainings the ability of participants to access the system themselves has strengthened the longer term benefit of the modules.
- It has been discovered that it is better to invite the young members from the co-operatives as they are more inclined to continue to use the computer than the older ones.
- The timing of the project and the fact that it is provided for free has been a key factor in its success. For it came at the time when both PRRM and the Land Bank were thinking of setting up similar projects and had already assigned budgets. Through linking with Land Bank, B2Bpricenow are able to use an existing banking system for transactions. In return the Land Bank are able to increase their client base as any transacting party has to open up an account with them.
- b2bpricenow.com is now endorsed as the " Official e-marketplace of the Philippines for Agriculture and Fisheries Sector " by COCAF - a bicameral committee composed of the Philippine Senate and House of Representative, and as the " Official e-marketplace of APRACA " (Asia Pacific Rural and Agricultural Association - which includes the 18 largest agriculture banks in Asia).
- b2bpricenow.com is also a deliverable in the State of the Nation Address (SONA) 2003 of President Gloria Macapagal Arroyo on Modernized Agriculture to Ensure Food Security.

Future outlook

- B2Bpricenow.com are currently setting up partnerships with computer hardware companies, cell phone companies and other service providers to expand this project to more farmers' co-operatives. In exchange the companies are able to advertise their products on the projects' web based market place.
- They are also planning to partner with the trade and industry department in order to market its services to small enterprises. In addition, they are looking to work with the National Food Authority in order to harness their warehousing, trucking and logistical services.


Stakeholder Consultation



- Development Marketplace 2001 **Full Proposal Form** for B2Bpricenow.com <http://www.worldbank.org/>
- *infodev* project details webpage <http://www.infodev.org>
- **B2Bpricenow.com Statistics Report**, 7 August 2003
- Herbosa, E 2003 **Final Project Report**
- **Third Quarter 2002 Report for infoDev**
- **Interviews** carried out by Soc Evangelista in August 2003
 - Edgardo Herbosa, B2Bpricenow.com founder
 - Ryk Ramos, Land Bank (Development Assistance Department)
 - Conrado Navarro, PRRM
 - Irene Fernandez, PRRM
 - Gemma Martin, PRRM
 - Members of the El Gancho Co-operative, Naic, Cavite
 - Members of the Kooperatibang Likas ng Neuva Ecija
- **infoDev Task Manager**, Jacqueline Dubow

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FOODNET: information is changing things in the marketplace

05.05.2004 12:41

Shaun Ferris explains how FOODNET, an ASARECA marketing and agro-enterprise network for East and Central Africa, is delivering reliable market information to farmers in Uganda, using a mix of conventional media, the Internet, mobile phones and other ICTs. In Uganda, FOODNET's market information services currently reach over 7 million people each week.

Four years ago farmers in Uganda were at the mercy of traders when it came to selling their produce. Traders were able to force down prices, as farmers had little idea of price movements and even less appreciation of market trends. Middlemen were able to pocket excessive commissions by exploiting unnecessarily large price differences between nearby markets. The results of this asymmetry in access to market information were low prices for farmers and high prices for consumers.

Today, things have changed. FOODNET ¹, a regional agricultural development network, has introduced three low-cost services that enable farmers, traders, and consumers to obtain accurate market information whenever they need it. In Uganda, FOODNET's market information services currently reach over 7 million people each week.

The national market information service is run by FOODNET in association with the Ministry of Trade, Tourism and Industry. Each day, agents collect price information on 32 commodities from four markets in the capital Kampala, and each week data on 28 commodities from 19 market centres across the country. This information is rapidly collated and relayed back to a range of clients including farmers, traders, processors, development agencies and policy makers via FM radio, mobile phones, email and the Internet.

FM radio and mobile phones

The main clients of the service are the many millions of small-scale farmers and traders scattered across the country. The best means of accessing these rural communities, where many people cannot read, is through FM radio. Each week, a 15-minute radio programme is broadcast to the nation via 12 FM radio stations in eight local languages.

In six districts of Uganda, the National Agricultural Advisory Service (NAADS) has linked up with FOODNET to provide a localized marketing service. This service, which is based on a pilot project funded by CTA, produces radio programmes and training specifically related to local marketing opportunities. FOODNET and the BBC are supporting this process by developing educational programmes that encourage farmers to adopt 'collective marketing' techniques, as group action enables farmers to use market information more effectively.



In the past five years mobile phones have been widely adopted in Uganda – there are now more than 800,000 phones in circulation. FOODNET has cashed in on this trend by establishing a commodity price database that can be accessed by SMS. In addition to voice communication, mobile phone users can now type in a key word such as 'maize' and send a text message to the MTN ² service provider and receive an instant update on the prices of maize on markets across the country. This information is used by farmers, farmers' associations and also by travelling traders who can identify market price differentials and shift lower-priced goods to higher-priced markets. It is these activities that make markets operate more efficiently.

The Internet and WorldSpace

For larger traders, policy makers and development organizations, market information is posted on the web and data can be emailed to subscribers on a daily or weekly basis (www.foodnet.cgiar.org and <http://radioworks.africacentral.net>). The Internet is also being used to build up a Regional Agricultural Trade Intelligence Network (RATIN; www.ratin.net) for maize and beans traders throughout East Africa. In an increasingly globalized world, traders can only be competitive in their regional markets if they have access to accurate, timely regional market information.

Various new technologies are being tested to support the expansion of market information services into Kenya, Rwanda and Tanzania. For example, to facilitate the transmission of text and voice data, FOODNET has linked up with RadioWorks to establish a regional network of FM radio stations linked via WorldSpace satellite. Using WorldSpace technology, FOODNET hopes to reach an audience of 25 million farmers by the end of 2004.

What does this mean for farmers?

For many farmers, FOODNET's market information services mean that, for the first time, they have access to reliable price data. Surveys have shown that farmers consider market information their second highest priority after roads. Farmers appreciate the information because it helps them in their negotiations with traders. Farmers' associations are also making good use of the information as they can bulk commodities and can more easily grade their produce. Farmers claim that access to market information has raised farm gate prices by between 5–15 % against general prices. Market analysis by the International Food Policy Research Institute has shown that over the past four years the number of markets dominated by farmers' associations has increased from 4 to 8. This is a very positive trend.

In a recent programme on the BBC World Service, a trader was reported as saying 'It's not easy to cheat farmers these days because they are getting information about market prices from the radio and some have access to a mobile phone. Things are changing'.

Shaun Ferris is coordinator of Foodnet in Uganda

1. FOODNET is an ASARECA marketing and agro-enterprise network for East and Central Africa, funded by USAID.
2. MTN is the South African Mobile Telephone Network

<http://ictupdate.cta.int/index.php/article/articleprint/313/-1/59/>

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ICT Update is a bimonthly printed bulletin, a web magazine, and an accompanying email newsletter. Each issue of ICT Update focuses on a specific theme relevant to ICTs for agricultural and rural development in African, Caribbean and Pacific (ACP) countries

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Welcome to KACE



Company Profile

Kenya Agricultural Commodity Exchange (KACE) is a private sector firm launched in 1997 to facilitate linkage between sellers and buyers of agricultural commodities, provide relevant and timely marketing information and intelligence, provide a transparent and competitive market price discovery mechanism and harness and apply information and communication technologies (ICTs) for rural value addition and empowerment.

KACE's vision:

To be a Commodity Exchange of the highest integrity, facilitating competitive and efficient trade in agricultural commodities in Kenyan, regional and international markets.

KACE's mission is:

To establish a Commodity Exchange in Kenya of the highest integrity, available to Kenyan as well as regional and international traders based upon an open free market system for the mutual benefit of sellers and buyers, and to facilitate the marketing of any commodity provided or desired by any consenting parties through the auspices of the exchange.

KACE objectives:

- To facilitate linkage between sellers and buyers, exporters and importers of agricultural commodities in trade;
- To provide farmers and market intermediaries (traders, brokers, processors and consumers) with relevant and timely marketing information and intelligence, and other services that enhance their bargaining power and competitiveness in the market place;
- To provide a transparent and competitive price discovery mechanism through the operations of the exchange trading floors; and
- To harness and apply the power of information and communication technologies (ICTs) as a strategic tool for rural value addition and empowerment.

MEMBERS LOG

email address

password

[Not registered](#)

EVENTS

SEMINAR

Friday, April :
Location: Hea
Details:
 Trading in new
Contact Person:
 Wycliff

FEATURES

RECOTIS

KACE has an internet-based Commodity Information (RECOTIS) dissemination information. For electronic clients interested in selling, importing or distributing commodities. [more...](#)

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Market Information Services



The Mobile Phone SMS

SMS is text messages sent and received with mobile phones. KACE is harnessing this ICT technology to disseminate market information and intelligence. KACE has developed an SMS market information service branded as SMS Sokoni in partnership with the Safaricom Limited, a leading mobile phone service provider in Kenya.

A farmer anywhere in the country where the Safaricom network exists can in easy steps access market information like commodity prices in different markets, who is buying or selling what commodity, at what prices, where and when, as well as access extension messages using their mobile phones.

The user receives and pays for the SMS messages to the service provider. SMS is easy to use, reliable, convenient and low-cost. The information is updated everyday and hence is most current and timely to the user. KACE is in the process of developing a similar service with a second mobile phone service provider in the country.

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Appendix B: Interview Guideline

Interview Guideline for Feasibility Study of SMS-enabled Collection and Delivery of Rural Market Information

Date of interview: _____

1. Introduce yourself and objective of interview
2. Interviewee's name _____ Gender _____ Age _____ years
3. Business type _____ Period of time _____ year(s)
4. Type of product (1) _____ (2) _____ (3) _____
5. Address: Village _____ Commune _____ District _____
Province _____ Tel No _____
6. Currently, where do you sell your product? What constraints do you face?
7. Currently, how do you get market information? Where? Do you trust it? How do you use it? Is it important for your business? Why?

(Explain new SMS market info system concept to respondent)

8. If price information is available through SMS for products that you are producing and selling:
 - Would it benefit you?
 - Would you use it?
 - How can the new system help in your business?
 - Would you trust it?
 - Would it help you to improve your business? Increase profit? Why?
9. How often would you need to check market info? When and why? How can it help?
10. What kind of market information do you need?
11. With respect to your present information sources and the new SMS-info system:
 - Which one would you find more trustworthy? Why?
 - What is advantage and disadvantage of these two systems?

Appendix C: Technical Issues

The following system description covers in broad technical terms the infrastructure requirements, software and data formats, etc. necessary for its operation.

System Description

Reference: Figure 1 in main report body

Market price or other data is communicated via the standard mobile GSM service of a Cambodian telco using suitably encoded and/or briefly formulated SMS messages to a dedicated server having a database and appropriate software applications for data compilation and presentation. The data is held available for users who are able to poll the required data by suitably encoded SMS messages sent to a specified telephone number.

Existing SMS Information Services

All of the major telecommunication companies (telcos) operating in Cambodia have confirmed that the envisaged service is technically do-able but none of them provide this at the current time. Two of the three telcos do offer SMS information services, with some similarities to the system that is envisioned for the SMS-MIS.

- SMART provides exchange rate, horoscope, news, and sports information through a semi-automated subscriber service. Users contact a service department (1454) to activate a semi-automated information service for a fee. The selected information is then sent by SMS to the subscriber on a regular basis.
- Mobitel offers gambling results (CamboSix) that are accessed by purchasing a special card that costs \$5 per month. There is some indication that Mobitel used to have other information available but discontinued the service (not confirmed).
- Camshin currently has no similar service.

Technology Options

Standardised Short Messaging Service protocol (SMS) is the best suited low-priced technology available for communicating market data to a server or retrieving prepared data from such a server at the present time by mobile phone. SMS is available to all users of mobile phones. The SMS service allows messages consisting of up to 160 characters to be sent for a fee. For specified services that have been registered with the telco, the fee may be an agreed specific amount that can be drawn down from the mobile user's pre-paid funds. Often, a limited number of free SMS messages are included when purchasing per-paid cell phone voice time.

Other protocols, that are likely less suitable include Wireless Access Protocol (WAP), an internet accessing technique which may be used to access a website for reading or downloading information that has been compiled and uploaded to a website. This service, also known as 2.5G, has been around for almost 10 years. It does not offer the same level of simplicity as SMS and it is also being effectively by-passed by new

mobile phone developments such as 3G and 4G that are capable of broadband data and video services on mobile phones.

Infrastructure considerations

The cheapest of mobile phones, priced from around USD60, can be used for SMS communication while WAP enabled phones are priced at least double this amount due to their need for a larger display and requirement for more sophisticated software applications.

Software Requirements

A number of SMS application packages for dedicated servers have been written and one of these worthy of recommendation is the FrontlineSMS Hub which is provided free of charge to charities and to the non-profit sector. See www.frontline.com for further information about this system that was conceived, designed and written for the non-profit sector. Furthermore, it is planned to release documentation and the project source code so this can be tailored to the specific needs of an organisation. Also at the above noted website, details about a new Open-Source SMS Forum to be launched by Summer 2006 will be found.

Potential Telecom Partners

Comparison of Potential Telecom Partners

Telecom	Pro	Con
012 Mobitel	<ul style="list-style-type: none"> Clearly the largest coverage area Approx 60% of all mobile users Has similar existing information service 	<ul style="list-style-type: none"> Possibly inflexible for our needs due to market leading position
011 Camshin	<ul style="list-style-type: none"> Approx 23% of mobile users 	<ul style="list-style-type: none"> Limited coverage in some provinces
016 Samart	<ul style="list-style-type: none"> Approx 16% of mobile users Has similar existing information service 	<ul style="list-style-type: none"> Smallest GSM network

Mobitel is potentially the most attractive partner for the SMS-MIS given their unquestioned coverage advantages in rural areas. In this connection, the authors had an initial meeting with Mobitel Chairman, Oknha Kith Meng, to introduce him to the project concept, the advantages to the rural farming community, and benefits for Mobitel. He was receptive to the idea without making any commitments. He requested a brief proposal, which IDE submitted in May 2006 (Appendix D). No follow-up has occurred since that time.

Coverage Area

Analysis of coverage area and trends

- Current area/population served:

Out of a provincial population of 12,360,061 (Phnom Penh excluded) a number 9,284,435 representing 75% of rural inhabitants are within the Mobitel GSM mobile (voice) coverage area. However, reliable SMS coverage requires a much lower GSM signal quality than is required for voice communications thereby the population served with SMS service can be safely assumed to be at least 10% above this amount, thus reaching a coverage of 85% or more of the rural population (see attached table for 012 coverage).

- Further growth rate
It is not expected for Mobitel's SMS service penetration depth to expand much more as large tracts of Cambodia's terrain is jungle in which there is minimal justification for a blanket service coverage. It should be noted that this telco has recently completed an intense 2 year network expansion program to ensure the retaining of its leading position – by coverage – in Cambodia.

Implementation

Steps required to set up and operate the telecommunication structure of an effective SMS-enabled Market Information Service in Cambodia.

- Negotiate and sign MoU with the selected telco partner(s)
 - Operational systems
 - o SMS hub server – providing for data input, storage, processing, polling, dissemination and overall operations log – to be co-located with the telco server as are other system servers OR located elsewhere with reliable, continuous internet access.
 - o The telco SMS Centre (server) takes care of charging at agreed pre-set rates locked to the dialled phone-number (initial digits) used when sending the SMS
 - o Submission of SMS with data for compilation should either be free or charged at minimum rate.
 - o Market data request (polling) under use of pre-arranged dialling-code causes telco's SMS server to charge the user an agreed, higher than standard, fee.
 - Software development
 - o A software application must be adapted for the SMS hub function.
 - o The existing FrontLineSMS hub software or other similar package can be modified to suit needs and thus cover this requirement.
 - o Basic text and spread-sheet program for reporting purposes
 - Hardware requirement and set-up
 - o Any cell-phone has the basic SMS feature required for this service.
 - o The SMS-hub is an application designed for installation on a standard desktop PC with monitor or even a laptop. hard disk say 20GB, 512MB RAM, CD-ROM, ethernet network interface, removable storage via memory stick will suffice.
- A. SMS-hub is located at a site distant from the telco's SMS Centre server
- o Standard PC input / output devices e.g.printer, scanner (possibly)
 - o Reliable 24hr internet connection with modest data allowance (500MB/month)
- B. SMS-hub is co-located within a few metres of the telco's SMS Centre server
- o Access to a standard office PC with Ethernet network interface (i.e. existing not project specific) located at Phnom Penh service site.
 - o Reliable 24hr internet connection with modest data allowance (500MB/month)

- SNMP interface connection between telco's SMS Centre and SMS hub of market data service.
- System testing
 - Software system testing can be almost entirely done at any time prior to installing the SMS hub
 - A. SMS-hub is located at a site distant from the telco
 - Minimal – say 1-2 days – for hardware set-up and commissioning
 - B. SMS-hub is co-located within a few metres of the telco's SMS Centre server
 - Minimal – say 2-3 days – for hardware set-up and commissioning
- Roll-out
 - There are no “specialised” hardware components so roll-out will be dependent upon prior learning and/or training (1 week) in use of the software application such as Frontline SMS

012 Mobile Network Penetration

Province	Population (thousands)			Villages		
	Total	Covered	%	Total	Covered	%
Battembang	933	820	87.8	567	485	85.5
Banteay Meanchey	680	565	83.1	604	465	77.0
Odar Meanchey	80	41	51.2	104	46	44.2
Siem Reap	819	661	80.8	874	715	81.8
Preah Vihear	140	42	30.1	203	55	27.1
Kampong Thom	670	482	71.9	733	489	66.7
Kmpg Chhnang	491	346	70.5	545	371	68.1
Pursat	424	260	61.3	465	319	68.6
Krong Pailin	27	21	77.4	58	41	70.7
Stoeung Treng	95	58	61.1	128	62	48.4
Rattanakiri	111	60	53.7	240	100	41.7
Mondulkiri	38	4	11.6	98	10	10.2
Kratie	310	244	78.7	256	173	67.6
Kmpg Cham	1,893	1,547	81.7	1,750	1,381	78.9
Koh Kong	235	85	36.3	125	43	34.4
Kmpg Speu	705	511	72.5	1,321	944	71.5
Kampot	622	492	79.1	477	364	76.3
Sihanoukville	183	126	69.0	85	46	54.1
Krong Keb	34	30	87.7	16	14	87.5
Kandal	1,265	1,120	88.6	1,089	875	80.3
Takeo	930	708	76.2	1,111	880	79.2
Svay Rieng	563	292	51.9	690	308	44.6
Prey Veng	1,113	769	69.1	1,135	744	65.6
Subtotal	12,360	9,284	75.1	12,674	8,930	70.46
Phnom Penh	1,176	1,176	100.0			
Total	13,536	10,460	77.3			

Source: After Indochina Research Ltd.

Appendix D: Sample Telco Presentation

The attached presentation was submitted to Mobitel Chairman, Oknha Kith Meng, in May 2006. Similar presentations could be adapted for other telcos.



IT-Enabled Rural Market Information

A Proposal for Collaboration with Mobitel

Proposed Collaboration

- Mobitel
 - Largest mobile communication provider in Cambodia
 - Largest customer base
 - Largest coverage area
- International Development Enterprises (IDE)
 - Non-profit NGO focused on pro-poor market development in rural areas
 - 12 years in Cambodia
 - Extensive experience in rural market networking



Business Objectives

- Revolutionize access to market information for small farmers and rural enterprises
- Increase profits of small farmers and rural enterprises
- Positive revenue stream for IDE and Mobitel

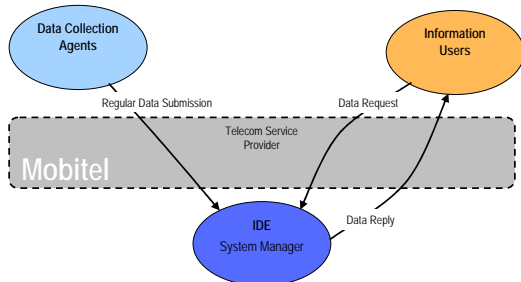


Strategy

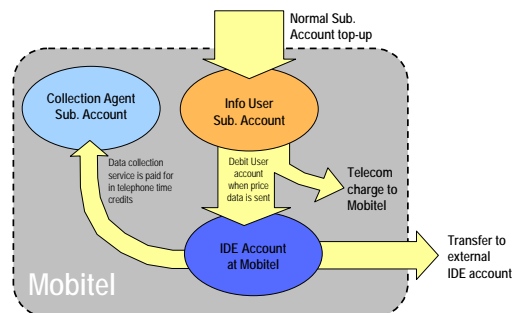
- Establish an SMS-based system for collection and dissemination of agricultural market information
- Market the service through:
 - Mass media
 - NGO and government development projects
 - Existing rural telephone shops



Information Flow



Cash Flow



Why this is a good idea?

- Enables timely and widely available market information
- Stimulates rural economies and reduces poverty
- Uses the simplest available technology to introduce rural users to Mobitel's range of services
- Sustainable because it pays for itself



What's in it for Mobitel?

- Expand rural customer base and SMS call volumes
- Positive revenue stream
- "Primes the pump" for introduction of G3 internet services in rural areas
- Makes a positive contribution to rural poverty reduction
- Enhances Mobitel's public image as a socially responsible company



Next Steps

- "Agreement in Principle" with Mobitel
- Develop business plan with support from GTZ
- Develop required software/hardware
- Pilot implementation in selected regions
- National scale-up

