

**Enhancing Rural Development through Improved Infrastructure and Innovative
Information Applications**

Viet Nam Country Report: Applications

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3 June 2007

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I. Introduction

This report is part of the study "Enhancing Rural Development through Improved ICT Infrastructure and Innovative Information Applications". The study seeks to show how improved connectivity and use of ICT applications in the East Asia and Pacific Region can facilitate economic diversification in rural areas, reduce transaction costs and improve public service delivery. Four broad sets of questions are addressed.

First, how well connected are rural populations in East Asia and Pacific (EAP) and what policy changes are needed to improve rural connectivity?

Second, how can high-value information applications be mobilized and scaled-up to improve rural productivity, livelihoods and living standards in the countries selected? What are the lessons learned from experiences elsewhere, and what kinds of advisory support and investments are required?

Third, how much capacity building is required for rural areas to create a society of producers of local knowledge and of users of that knowledge?

Fourth, how can government efforts to promote rural development – in various forms – and to develop rural infrastructure be more closely integrated, conceptually, institutionally and in practice?

The study focus is on four countries - Indonesia, Philippines, Lao PDR and Vietnam – and on three key applications selected for their potential impact on rural livelihoods: *Wireless-enabled financial services; Wireless or Internet-based Market or commodity price information; Internet-based Land Management Systems.*

This Country Report presents the study's findings for Viet Nam. It seeks to identify key demand and supply features associated with the three applications selected and help chart a strategic course of action for realizing their potential.

II. Wireless Financial Services

Rural Finance, Mobile Telecommunications and m-Banking Experiments

Five State owned banks account for 80% of total banking assets in Viet Nam. Rural financial markets are dominated by the two government owned Viet Nam Bank for Agriculture and Rural Development (Agribank) and the Viet Nam Bank for Social Policies (VBSP). Whereas Agribank aims to develop as a commercially viable bank, VBSP is mandated to serve low income customers on concessionary terms.

Microfinance is growing in importance but the total number of clients of microfinance institutions is still low, in the order of 350,000 or less than 2% of the country's population, and many of these institutions only operate in urban areas. About 43% of respondents to a survey of poor people in 12 communes in Hoa Binh, Thanh Hoa and Dak Lak provinces, reported loans from family, neighbors and friends to be the most important form of assistance in times of need. The second most often cited form of assistance, by 29 percent of respondents, was loans from money lenders (Marx 2007, page 19).

Electronic banking services in Viet Nam are in their infancy and serve primarily the emerging high income entrepreneurial sector. Modern automated services to an estimated 6.2 million bank accounts (in 2005) include about 2,100 ATMs, 1.1 million ATMs and Internet banking (Nhan 2005, 2006).

Mobile telephone penetration is low, 11.9% in 2005 according to ITU (Table 1), but has been growing at a fast pace of about 53% per year in 2002-2006. The former monopoly operator, the government-owned Vietnam Post Telecommunications Corporation (VNPT) controls 90-94 of the telecommunications sector. The two largest mobile operators are subsidiaries of VNPT, Vinaphone and Mobiphone, which together controlled about 82% of the market in 2005. There are four other licensed challengers – S-Fone, Hanoi Telecommunications, Viet Power Telecom and Viettel - all of which are also State Owned Enterprises. Vinaphone and Mobiphone cover all urban centers and GSM signal is reached in practically all parts of the country (MPI-UNDP 2006 page 19). In January 2006, Vinaphone had 3.6 million customers, Mobiphone 3 million, Viet Nam Military Telecom Company, Viettel, which began operating in October 2004, 2 million and SPT's S-Fone 400,000 (NPI-UNDP 2006, page 19).

Foreign investment to date has taken the form of Business Cooperation Contracts (BCC) through which foreign partners provide investment capital and earn a share of the revenues but have no ownership stake in the company. Mobiphone, for example, was formed through a BCC contract between VNPT's subsidiary Vietnam Mobile Service's Company with Sweden's Comvik AB. Similarly, S-Phone was formed in July 2003 through a BCC agreement between Saigon Post and Telecommunications (SPT) and Korea's SLD Telecom. Service prices have fallen sharply and appear to be on par or even lower than those prevalent in South East Asia.

The key drivers of competition have been responsiveness of VNPT to government policy and vigorous competition, even between the two dominant carriers belonging to VNPT (Toulmin and Smith 2006). Nevertheless, VNPT's dominance and control over key infrastructure assets hinder greater dynamism and innovation. For example, according to regulations of the Ministry of Post and Telematics (MPT) VNPT is obliged to provide interconnection within 45 days, but in practice this is seldom achieved. It took Viettel 5 to 12 months to negotiate interconnection agreement with VNPT, another 5 to 6 months to negotiate separate interconnection agreements with VNPT enterprises, plus another eight months to lease an international line from VNPT (NPI-UNDP 2006, page 46).

Mobile operators have started to experiment with m-banking services albeit timidly. In 2007 Vinaphone used the popular Lunar New Year tradition of exchanging gifts to enable its clients during this one holiday to share "lucky money" in the form of air time load. Also, about 10% of the company's air time loads are recharged over the air instead of sold in the form of scratch cards. e-loads is a precursor m-banking service, as it implies the transfer of value over the phone.

m-Banking Options

There are two entrepreneurial m-banking options. A mobile operator may partner with a licensed commercial bank to offer m-banking services (Box No. 1) or it may opt to go at it on its own as leading enterprise (Box No. 2).

Text Box No. 1: Smart Money: a mobile banking partnership

Smart Money, was introduced in the **Philippines** in December 2000 by Smart Communications, the leading mobile phone provider in the Philippines, in partnership with Banco de Oro (BDO), one of the top seven commercial banks in the country. Smart Money customers may use their mobile phones to transfer credit to and from other users, transfer airtime credit from one user to another, make cashless purchases at shops where the retailer has SMART Money account and at any MasterCard enabled retailer, receive payroll credit on their phones directly from an employer signed into the system, pay their utilities and receive international remittances. The service operates in conjunction with a prepaid debit card issued by Banco de Oro enabling lower income subscribers to participate using BDO ATM machines and making payments in stores that accept Master Card.

Smart Money accounted for less than 0.1% of total service revenues posted by the company in 2006, but direct revenues are a poor measure of the importance of the Smart Money platform. Smart Money helps increase outreach, reduce churn and lower distribution costs. Smart's CEO estimates that churn among Smart Money customers is about 0.5% per month compared to 3% among non-Smart Money customers. Use of the SmartMoney platform also eliminated the need for the production, storage and distribution of prepaid scratch cards and makes it easier for Smart to service low income customers who can only afford purchase air time loads in small denominations. A potential retailer needs very little money to start reselling air time: a GSM handset, a retailer SIM card preloaded with 50 text messages and costing US\$ 3.10. Since e-Load was enabled in May 2003 to end 2004, the number of retail dealers increased from 50,000 to 700,000. Most retailers are micro-entrepreneurs: neighborhood stores, housewives, students working part time. By September 2003, two thirds of Smart's pre-paid user's were loading electronically

By the end of 2006, 5 million or 20% of PLDT's total prepaid customers (25 million) were registered Smart Money users. The average value of daily transactions using Smart Money was US\$ 257,200/day. In 2006, the total value of Smart Money remittances sent from abroad was about US\$ 28.9 million; total value sent within the country was US\$ 113.7 million.

The advantages and disadvantages of either option are related to cash in-cash out options and regulatory constraints. M-banking is subject to strong network effects. Its usefulness is directly proportional to the number of merchants that accept the use of electronic transfer of money credits. M-banking therefore requires the development of an ecology of merchants who enable encashment or the purchase of goods and services with electronically transferred money. With respect to regulation, mobile banking raises no

special issues for telecommunications regulators but does present important challenges for financial regulators.

A partnership arrangement has two advantages. The first is related to how soon the service can be useful to customers. For example, in the case of the Smart Communications alliance with Banco de Oro in the Philippines (Box Number 1), an expansion of the number of merchants that allow use of the mobile phone purchases is necessary, but the partnership immediately enabled widespread use of the Banco de Oro pre-paid card for encashment or to make purchases in the many outlets that use Master Card world wide. From a social standpoint, a drawback of this approach is that it involves having and regularly using a prepaid card, a requirement which will tend to limit participation by low-income and rural customers most of who generally operate on a cash basis.

The second advantage of a telecom-banking partnership concerns financial regulations. When m-banking is linked to a bank, the latter institution takes care of meeting financial regulatory requirements. Furthermore, some countries – e.g. South Africa – only allow m-banking services to be provided in conjunction with licensed banks (Lyman, Ivatury and Staschen 2006, page 3).

Direct operation of an m-banking service by a mobile operator offers the advantages of a simple unified management and no need to share profits. Some partnerships with banking institutions will still be desirable, mainly to help develop the network ecology that is indispensable for the service to be useful to customers (See example in Box No. 2).

Text Box No. 2: GCash Mobile Banking and Rural Microfinance

GCash was launched in October 2004 by GXchange, a subsidiary of Globe Telecom, the second largest mobile phone operator in the **Philippines**. The service is run with no direct ties to any banking institution. Globe subscribers register to GCash to extend the use of their mobile phones as electronic wallets. Once registered, subscribers can use their GCash wallet to send and receive funds and make cashless purchases at shops where the retailer originates the transaction using her own phone or buy prepaid airtime via SMS. Start up costs for a new customer simultaneously enrolling as prepaid mobile and GCash using second hand equipment can be as low as US\$ 13.00.

A precursor to GCash, AutoLoadMax was launched by Globe in 2003 to enable electronic loading of air time. By December 2004, AutoLoadMax accounted for 90% of reload transactions and about 62% of total reload value. AutoMaxLoad presently supports an extensive network of active distributors which by the end of 2006 numbered more than 400,000. Another GCash precursor financial service, ShareALoad, started in January 2004, enables Globe subscribers to top up the air time of other Globe users in increments of P1 up to P150.

Since November 2004 the USAID sponsored Micro-enterprise Access to Banking Services (MABS) Program (www2.rbapmabs.org) has been working with G-Xchange and the Rural Bank Association of the Philippines (www.rbap.org) to experiment using GCash as a microfinance service delivery platform. Participating banks become retailers where GCash customers may cash-in or top up their electronic wallets. Bank loan customers may also pay back their loans electronically using Text-a-Payment or make deposits into their savings accounts using Text-a-Deposit. Rural Banks are also using the m-banking to manage their payroll and pay their staff electronically.

At the end of 2006, out of a total base of 15 million Globe subscribers, an estimated 500,813 were registered users of GCash. The average monthly value of transactions is about US\$ 117 million.

Both Agribank and the Viet Nam Bank for Social Policies (VBSP) appear poised to help develop an m-banking ecology in Viet Nam. The VBSP is particularly suited to serve low income rural communities. It has 64 provincial and municipal branches, 597 district offices where transactions may be carried out, and more than 8,000 mobile transaction units using laptops and regularly visiting communes and wards. In all, VBSP has about 4.7 million borrowers and 250,000 savings and credit groups (Nhan 2005, 2006).

Is there Widespread Demand for Wireless Financial Services in Viet Nam?

Success Factors and Potential Demand

The most mature experience with wireless financial services worldwide is that of the Philippines. The conditions that facilitated the emergence of m-banking in the Philippines provide a useful backdrop against which Viet Nam's potential may be assessed.

- i. A **large population** constitutes a financially attractive potential market and gives entrepreneurs a significant incentive to innovate.
- ii. A concentrated **urbanized** population facilitates **mobile penetration** and the development of **an m-banking ecology** of parallel encashment facilities and vendors willing to accept electronic payments.
- iii. A **text messaging culture** is a distinctive feature of mobile use in the Philippines, and is closely linked to a **young literate and relatively low income** (but not extremely poor) **population**. Low income people recur to texting as a more affordable means of communication than voice calls. Youths are amenable to texting in part because of their greater dexterity and also because they generally have lower income than mature working adults.

Viet Nam has considerable m-banking potential. Vietnam's population, 85 million people in 2006, represents a potentially large market, similar in size as that in the Philippines (Table A1). Viet Nam also has a young (48% less than 19 years old) and literate population, even though there is a gap between female (13%) and male illiteracy (6%). The main obstacle that Viet Nam will need to overcome is expanding mobile service to a predominantly rural (74% compared to 37% in the Philippines) low income population. Vietnam's per capita income in 2005 was less than US\$ 2/day.

Constraints

Viet Nam will need to address two major challenges before it can realize its potential for developing wireless financial services. First, its telecommunications infrastructure will need to be developed. Second, the country's central bankers will need to develop a suitable financial regulatory framework.

The country's telecommunications **infrastructure** has been growing very fast but the countryside still has limited coverage. Toulmin and Smith (2006) report that the number of telephone lines in service have grown from 100,000 in 1991 to 16.2 million in 2005, of which 57% (9.3 million) were mobile. There is some mobile service in all of the country's 61 provinces, but most of this growth has occurred in the cities. Urban teledensity was reportedly 15-30% compared to about 3% in rural areas. Some development projects have begun to address these shortcomings, e.g. a JICA funded project to install 140,000 phones in 10 central provinces, but much remains to be done.

Lack of information and regulatory criteria and standards for m-banking is also a critical challenge. In order to increase m-banking services, the country's Central Bank will need to develop its own framework for managing risks associated with service provision. It should strive to achieve a balance between enabling innovation and managing risks. To encourage innovation and support entrepreneurial flexibility, the two main options should be allowed: either a partnership between a mobile operator and a licensed bank or direct service provision by a mobile operator. The key financial regulatory issues are outlined in Annex B.

Competition is the Key to Stimulating Supply and Realizing Viet Nam's Potential

The demand for financial services in Viet Nam is presently very limited. Nevertheless, the country's demand potential is significant. As competitive pressures increase in both the banking and telecommunications sectors, wireless financial services will become attractive innovative ways for enterprises in both industries to grow and strengthen their market positions. In the process, it will encourage a significant expansion in the rural outreach of both banking and mobile enterprises.

As **competitive pressures in mobile telephony** rise, operators will find an m-banking platform to be a strategic innovation that can help them reduce churn, achieve lower distribution costs and expand their network to reach low income customers.

Keeping customers loyal is a major challenge in Viet Nam's predominantly (80%) pre-paid market (Table A1). Industry observers estimate that out of the 17 million subscribers reported by mobile operators in July 2006, only 11 million may be active accounts. Mobiphone, for example, had 5 million registered subscribers of which only 3.7 million were active. The difference is due to churn as users shift from one company to another in response to discounts offered by competing networks (Viet Nam Economic Times 2006).

Churn is significantly lower among m-banking customers because the service is not readily transferable from one operator to another. In the Philippines, Smart Telecommunications CEO has estimated the churn rate among SmartMoney customers at 0.5% per month compared to 3% among non-SmartMoney customers (Wishart 2006, page 16).²

An m-banking platform facilitates electronic loading of air time which significantly reduces retail distribution costs. The need to produce, store and distribute prepaid scratch cards is eliminated, and the number of retailers may be expanded much more rapidly while retail commissions may be lower.³ Lower distribution costs will in turn make it profitable for a company to expand service to low-income customers by offering more affordable low denomination air time loads.⁴

As **competitive pressures in banking** increases in Viet Nam, state-owned banks will need to develop new ways to expand service to an increasing number of low-income customers profitably. They will only be able to do this by adopting innovative ways to lower service delivery costs.

The high transaction costs of serving a large number of customers with limited assets or credit history each of which generates only a little revenue is a critical challenge of microfinance, worldwide. The challenge is greatest in rural areas because of the lower income and greater dispersion of the customer base. Microfinance institutions have achieved sustainability and earned a profit on commercial terms, but mostly at the expense of limited-value products such as small high interest short term loans. Modern institutional approaches (village banking, group lending, credit rating) and modern

technologies (computerized record keeping, PDAs) have helped lower costs; but the costs of service delivery remain high.⁵

M-banking can significantly lower microfinance service delivery costs (Owens 2006, 2007) by:

- i. reducing the direct costs that microfinance institutions incur to deliver both savings and credit products;
- ii. reducing errors and increasing transparency in the transfer and recording of loan disbursements and payments and savings deposits;
- iii. reducing opportunities for fraud, counterfeit and theft by providing a secure electronic mode for transferring funds (as opposed to, for example, travelling long distances to transfer cash);
- iv. facilitating record keeping on each client through the computerization of transactions made through mobile phones, thus making it easier for microfinance institutions to tailor products and services for segments within their large pool of small customers.

An example of m-banking as a service delivery platform for rural microfinance is given in Box No. 2.

III. Agricultural and Rural Market Information Systems

MIS Objectives

The focus here is on market information systems (MIS) that service farmers. Farmer needs tend to be diverse and systems developed generally have three main objectives:

- i. **Reduce price instability and intermediation costs** by disseminating timely information about prices and market conditions to improve farmers' bargaining power and farmers' ability to time and coordinate their supply response to better respond to market requirements. This objective is paramount in respect of fresh perishable produce markets.
- ii. **Expand market opportunities** for farmers and agro-processors by facilitating access to new marketing channels.
- iii. Produce and disseminate **market intelligence** information to help farmers and agro-entrepreneurs innovate, enter new markets, develop new products and new marketing and organizational techniques that add value to farm output.

MIS operated by Ministries of Agriculture have traditionally focused on the first objective. To empower farmers and mitigate price instability they collect and disseminate product and input price and market supply data. The information is gathered at wholesale market sites by support staff, sometimes with the assistance of traders and farmers, and subsequently disseminated using traditional broadcast media, radio, television, newspapers and fliers. These data collection efforts are costly. Price data is site specific which means that every major market needs to be covered; and, in order to be reliable, data should also be frequently updated (e.g. daily). The high cost of timely data gathering and dissemination challenge developing country governments. The resulting information systems are commonly deemed unreliable or too irregular to be useful.⁷ Farmers consult the information disseminated by government and even use it as baseline information (e.g. as a starting point when negotiating with buyers), but tend to rely more on price and market information obtained through their own network of traders, farmers, and friends (David-Benz, Wade and Egg 2005).

Producing and disseminating information products and market intelligence to expand marketing channels or add value (objectives ii and iii) have traditionally been costly (e.g. fairs, specialized analytical reports for niche products) and the target audience usually small. Justification for public sector involvement has been limited and private analysts and brokers have been the prime service providers.

The emergence of ICTs has stimulated innovative efforts by private enterprise, governments and donors to take advantage of lower data collection and information dissemination costs to produce more commercially valuable information services. Some examples of initiatives addressing the first objective follow:

In Sri Lanka, a pilot project funded by the Information and Communications Technology Agency (ICTA) developed a Govi Gnana (Farmer Knowledge) System to increase the transparency, accuracy and timeliness of price information on about 130 vegetable products traded in the spot markets at Dambulla Dedicated Economic Zone (DDEZ) and in the smaller the Meegoda Dedicated Economic Zone (MDEZ) (de Silva 2005). Local traders fed the system to improve performance and compete with other wholesale markets. The system was also supported by 3 investigators with PDAs roaming around the market verifying the information provided. Centrally located gigantic screens broadcast the information and have become popular among farmers visiting the markets. Government recognizes the

new approach as a public service but has yet to assume running costs and the system's sustainability remains uncertain.

In Senegal, a value added operator on GSM, Manobi, has since 2003 been providing price and weather information to fisherfolk and has since expanded to a broader range of farmers. Market data is gathered in three locations in Dakar by four collectors using PDAs, and retransmitted to farmers and fisherfolk via mobile phones. In the vicinity of Kayar, the system extends wireless coverage 14 km from the shore of allowing fisherfolk to access information while they are still at sea. The sms version of the Xam Marsé system launched in May 2005 reportedly serves 3,400 farmers who receive a free daily price update through their mobile phones. One clear advantage of Manobi has been its flexibility to tailor services to suit the specific needs of individual farmers – e.g. a farmer's sms may obtain information on a specific product, as opposed to a having to browse through a list of products most of little interest. (David-Benz, Wade and Egg, 2005). There is also the potential to use sms services to expand market outlets through systems that take remote purchase offers to buy or sell (objective ii above) and provide market intelligence over the mobile phone (objective iii). Donor funding supported the development of the Manobi application, initially IDRC and InfoDev (2003, page 34) and subsequently Swiss Cooperation (Manobi 2005), but Manobi hopes to operate at a profit. In August 2006 Manobi partnered with IICD to carry out pilot projects in Burkina Faso, Ghana, Mali, Uganda and Zambia (Manobi 2006).

In **the Philippines**, the Ministry of Agriculture partnered in 2005 with an applications development company and a Telecommunications company (Globe) and set up a system for reporting prices in response to sms requests. A farmer or consumer wanting to learn of prevailing prices may send a simple sms and he will get in return price information gathered in Metro Manila retail "wet" markets. The cost of the service is about US\$ 0.05 for the service involving 2 messages (query and response), which implies a surcharge on the standard cost of about US\$ 0.03. For the Ministry of Agriculture the system presents an opportunity to disseminate the data collected through a new channel. For the content manager and Globe, the service is a profit opportunity by making price information available in a convenient and timely manner. The price service along with weather information generated considerable initial enthusiasm - about 200 queries a month, but interest has since subsided to less than 20 sms per month in February 2007.

In Viet Nam, the impact and sustainability of MIS initiatives has been limited in part because Government's use of MIS as a service to farmers is barely starting. The country's experience clearly shows how ICTs lower the costs of data collection and production thus making it easier to achieve financial sustainability. Computers, mobile phones and the Internet today allow public agencies to collect, process and transmit the data at low cost within the same day and this is an important accomplishment.

The following section describes notable MIS initiatives in Viet Nam. These experiences focus primarily on addressing the first objective, i.e. reducing price variability and intermediation costs of fresh produce markets.

Viet Nam's MIS Experience

Since 1986 Viet Nam has been undergoing a major social and economic transformation that involves increasing reliance on markets and on individual decision making. This shift requires a change in the attitudes of farmers and government officials. Government agencies are experimenting and developing expertise with new forms of intervention and new approaches to public service delivery. Farmers are also adjusting to the new environment. They now have to decide what and when to produce and who and where to sell. This offers greater opportunities for gain, but it increases exposure to market risks.

Vietnamese farmers assign high priority to obtaining reliable and timely information about market opportunities, market conditions and prices. Poverty in Viet Nam (2005) is more prevalent in rural (44.9%) than in urban areas (18.3%). Because many Vietnamese farmers are poor, misinformed production and marketing decisions can have grave consequences in living conditions and family standards. Thirty five percent of respondents to the 2004 household survey conducted by Ministry of Labor, Invalids and Social Affairs (MOLISA), cited lack of market information as the third most important cause of poverty. Only two other causes - lack of capital and of production knowledge - were cited more frequently as a major cause of poverty (Table A2).

Viet Nam's MIS experience has been mostly experimental and linked to donor projects. Documentation on these experiments is sparse and the MIS established have often been discontinued shortly after the donor project has ended (Joughin 2004, Cunningham 2007). Most initiatives have used traditional data collection techniques and paper or broadcast media (radio, TV) to disseminate the information. Because the Internet and telephone penetration in rural communities is very limited (Table A1), their use in farmer-oriented MIS has been negligible.

Two farmer oriented public MIS initiatives appear to have good prospects of sustainability: the MIS developed by ICARD for fruits and vegetable markets with funding from the Ministry of Agriculture and Rural Development and assistance from the Information Capacity Strengthening for Agricultural Policy Formulation Project (MISPA) (Ngan Hoa and Huong Thuy 2006); and the MIS designed to serve Vegetable producers supplying the Hanoi market developed by the Sustainable Development of Peri-urban agriculture in South East Asia Project (SUSPER; www.avrdc.org/susper). Both systems use similar methodology and approach and after SUSPER funding ended responsibility for the MIS has been assumed by ICARD with some financial support from the Asian Development Bank. The focus here is on the well documented SUSPER MIS.

SUSPER was sponsored by the Government of France and was implemented between 2002 and July 2006. In 2003 SUSPER helped establish a MIS to serve four traditional vegetable producing areas supplying Hanoi City⁶ involving three agencies: the Research Institute of Fruits and Vegetables (RIFAV), established in 1990 based in Hanoi; the Information Technology and Statistics Center for Agriculture and Rural Development, ICARD; and Hanoi's Department of Agriculture and Rural Development, HDARD. (www.hanoi.gov.vn/hanoiwebs/en/hanoi_governance/group2/page2_16.htm).

The SUSPER MIS makes price information on ten vegetable products from 4 Hanoi markets available to farmers in 4 vegetable producing areas on the same day that the data is collected. Timing is essential for a system that aims to increase the bargaining power of farmers and reduce marketing margins and price variability. Such fast turnaround between data collection and dissemination is difficult but SUSPER appears to have achieved it through:

Vegetable market intelligence reviews of market situation and seasonality and vegetable quality management disseminated through 6 newsletters (2002-2005) to cooperative leaders in the project areas. This material provided background information useful in the design of the MIS;

Five consultation workshops held between April and June 2003, with farmers, traders and extension agents in the 4 project areas to identify key products to be reported on and market information and dissemination requirements.

Establishment of a simple, low cost, precise protocol for the collection and dissemination of key price data on a few products that responds to farmers manifest needs (Table A3).

Set up of operating partnerships between three stakeholder agencies with clear roles assumed by each.

Periodic monitoring of effectiveness to identify any adjustments needed in the system.

Effective use of ICTs for data collection (telephone) and transfer of data between agencies (Internet, telephone, fax) combined with dissemination by means readily accessible by farmers (television and local megaphone).

RIFAV is responsible for data collection, for which it relies on 3 traders per market and one contact trader to relay the data. RIFAV then prepares data tables in a spreadsheet and includes simple comments on upward or downward trends. The data is transmitted to HDARD and ICARD through fax or the Internet. ICARD posts the data on the Ministry's service website (www.agroviet.gov.vn) and also relays it to two television stations, VTV2 and Hanoi TV for subsequent broadcasting.

While the project was still running, HDARD would send the information by phone or fax to contact farmers in the project area who would then inform the farming community using loudspeakers every day or at least every other day.

In all, the system engaged on a part time basis: 3 RIFAV staff, 1 ICARD staff, 1 HDARD staff, 3 contact persons in each of 3 markets and 1 contact person in a fourth market (located near RIFAV) and 1 contact person in each of the project areas (for data dissemination). Annual running costs are estimated at US\$ 8,000.

The SUSPER MIS shows what can be achieved but also the challenges faced by a farmer oriented MIS, especially one aimed at empowering farmers and reducing intermediation costs and price variability in high-value high-risk vegetable markets.

Farmers make market decisions are based on data sources that they trust. Some farmers develop close personal and business relations with individual collectors and wholesalers and the information that they get from these sources is trustworthy and serves their purposes.

Farmers have access to and make use of the information generated by the SUSPER MIS. A survey carried out in March 2006 estimates that 72% of farmers (out of a total of 76 farmers interviewed in 3 project areas and 4 non-project areas) had access to price information. Farmers from both project and non-project areas had a similar high rate of access to vegetable market price information generated by the MIS.

All of the farmers surveyed that gave details on how they used the information (48 in total) reported that they used the information to get better prices during negotiations with intermediaries (collectors who are also often farmers themselves), 32 said the information helped them choose which vegetable to produce, and 13 indicated the information affected whether they would go or not to the market to sell their produce.

Television broadcast was the principal source of information accessed by farmers and the one that was most widely appreciated. Farmers showed a preference for TV broadcasts at 7:30-8:00 PM, which is unfortunately also a peak demand period for other kinds of television programs.

Television channels disseminate price information with some delay. VTV2 broadcasts on Tuesday through Thursday cover price reports for Saturday-Tuesday; broadcasts on Friday through Sunday cover price reports for the previous Wednesday-Friday period.

The value assigned to loudspeaker broadcasting of information varied; with some project areas more appreciative of the service than others perhaps as a reflection of variations in the quality and dependability of the service between project area. Some farmers felt that the loudspeaker broadcasts at 5 pm conflicted with their work in the fields. Other farmers lived too far from the areas covered by the loudspeaker broadcasts and were unable to benefit from the service.

Since the SUSPER project's completion HDARD's participation and data dissemination in the 4 project areas using loudspeakers has been discontinued. The MIS is still running under ICARD leadership in partnership with RIFAV. The Asian Development Bank under its Agricultural Sector Development Program (ASDP) is funding its continuation and further development to cover 20 Provinces and 100 Districts at an estimated cost of 38 billion VND (US\$ 2.3 million).

Is there Widespread Demand for MIS Services in Viet Nam?

There is considerable evidence showing that farmers demand and recognize the value of market information. What is less clear is whether the public or private sectors can develop ICT applications to supply this demand in a sustainable way; i.e. whether the benefits of particular applications outweigh the costs of the service and whether the institutional models used to deliver the service are sustainable.

Farmer needs for information differ depending on the market. To appreciate farmer demand for agricultural market information services and the adequacy of the supply response – the MIS applications that are being developed to meet that demand – it is useful to distinguish between different requirements according to the three MIS objectives identified.

Reducing Price Instability and Intermediation Costs

The need for timely site-specific price and market information is most exacting for fresh produce, such as fish and fruit and vegetable markets. Improvements in the timeliness of information provided by the SUSPER MIS were appreciated by farmers and had clear positive effects on their supply response. Note, however, that the few Vietnamese farmers who have a telephone prefer to receive market and price data through this means (RIFAV, page 35). This preference for the phone as a means of dissemination of market information is becoming increasingly common as mobile penetration increases; for example among vegetable farmers in Bukidnon in the Philippines.⁷ Experimentation in the Philippines shows that the possibility to disseminate price information economically via sms is technologically within reach, but organizing an sms service that is attractive for farmers to pay its cost remains a challenge.

When they have access to mobile phones, farmers on their own initiative have proven adept at collecting the information they need and acting in their best interest coordinating sales and reducing price variability and intermediation costs (Box No. 3).

Text Box No. 3: Effect of Mobile Phones on Market Prices and Fisherfolk Income in Kerala, India

Fish farming is important in Kerala, employing as many as a million people. Fish is sold every day along the beach in small markets that operate only for a few hours – typically 5 AM to 8 AM. Until 1997 fisher folk had no information on market conditions. Fuel costs and difficult road conditions limited fishermen to visiting and selling their product in only one market each day right. Data collected during this period shows wide price dispersion in markets that were not all that distant from each other. It was not uncommon to find several fishermen with their catch unsold while in nearby markets buyers left without fish.

Mobile phones were introduced in Kerala gradually starting in 1997. Towers were built to serve cities along the coast and in the process provided coverage 20-25 km out to the sea. By 2001 about 60% of all fishermen and retail and wholesale, traders were using mobile phones to coordinate sales. The standard deviation of fish prices expressed as a percent of the average price went from 50-60 percent before mobile phones to less than 15% after they were introduced. Waste which previously averaged 5-8 percent of the catch was eliminated entirely. Fisherfolk profits increased by 8 percent while and consumer prices were reduced by 4%. These effects are directly attributable to the introduction of mobile phones. These impacts were staggered, with price effects observed in the different coastal markets soon after mobile coverage was expanded to serve the corresponding sea area.

(Jensen 2007; The Economist 2007)

Expanding Market Channels

Some Vietnamese private initiatives are beginning to use the Internet. For example, Vinafruit, an association formed in 2003 with about 50 members, including fruit growers, processors, seed suppliers and the Southern Fruit Research Institute (SOFRI) has developed its own website (www.vinafruit.com) with USAID assistance, where basic information is presented in Vietnamese.

It is unfortunate that so little use has been made of the Post, Telecom and Cultural Points for Communes set up in existing post offices by Viet Nam's Ministry of Post and Telematics. These centers seem to be ideal for disseminating market information and help expand market channels. Often, the simple use of email can be a powerful way to identify market opportunities, make contacts and establish business links.

The Post, Telecom and Cultural Points for Communes program was started before the creation of MPT when VNPT was still providing national leadership determining investments in telecommunications. The original plan called to have 100% of all communes in the country with postal offices serving as culture points by 2005. These culture points would provide free access to newspapers and magazines and a small library of books, as well as subsidized paid services: fax, telephone, Internet, postal parcel and regular mail (Vietnam Post News 2002).

There is little information regarding the present status of these Post, Telecom and Cultural Points for Communes.⁸ Some observers assert there are 6,500 functioning. It is not known how many of these have Internet connectivity; estimates vary from 4% (in 2004) to 30%.⁹ Most of these centers generate little revenue and require State subsidies to survive. VNPT continues to be the principal investor in the establishment of these centers, each of which require about US\$ 4,500 to set up. The major source of revenue appears to be the sale of air time load for VNPT's mobile subsidiaries. MPT plans to continue supporting these centers applying resources of the recently created (2005) Universal Service Fund.

The Post, Telecom and Cultural Points for Communes are often mentioned by Government officials interested in expanding rural service outreach, but there is no evidence of efforts to deliver public services to rural communities via the Internet that has been made accessible through these centers. As competitive pressures increase, the use of sustainable telecenters to deliver paid-for services through electronic means is likely to become an attractive option, particularly to the extent that it is part of a profit making enterprise. (Box No. 4)

**Text Box No. 4: B2BPriceNow.com Dual Approach:
e-Commerce and Expanded Farmer Access to ICTs**

B2BPriceNow.com **in the Philippines** seeks to expand market opportunities for farmers and rural residents by increasing their access to ICTs and to new market channels (www.b2bpricenow.com). The company's strategy is to build up a loyal customer base of farmers by helping financially sound cooperatives to start their own telecenter on a profit basis and simultaneously demonstrating the power of ICTs for e-commerce, training cooperative members in the use of ICTs and providing services through its online market place and via sms.

By March 2007 twenty four B2B Centers had been established under the company's franchise (<http://b2bcenter.biz>). Services offered in B2B Centers are Internet/Computer access, photocopying, fax, sale of cellular phones and mobile air loads (retail and wholesale), remittances, courier services and sundry goods.

As the number of B2B centers have increased, so have the number of registered-user sessions in the B2BPriceNow.com e-commerce portal. If plans to expand services materialize company profits and its prospects for sustainability will rise. Especially promising are the company's plans to broker, support and promote among cooperative members and B2B Centers the use of a Land Bank prepaid card which is also expected to enable some m-banking services.

Providing Market Intelligence

Market intelligence comprises strategic analysis of markets and marketing prospects. The demand for this kind of information largely comes from firms well endowed with human and physical capital that are in a position to seize new market opportunities and profit from them. Market intelligence information often involves a broad range of information fields, such as production practices, selection of variety, product quality control, processing methods, packaging, marketing channels, financing, etc.

In a developed country like the US Government MIS tend to be more useful for the better educated farmers and for analysts and consultants who use the information produced by government as raw data from which tailor-made information products are prepared – especially market intelligence – to address the specific needs of individual farm entrepreneurs (Just and Zilberman 2002; Wolf *et al.* 1998). The same probably happens with some of the information products provided by Viet Nam's Ministry of Agriculture (www.agroviet.gov.vn).

By lowering costs of interaction between civil servants and the public, ICTs are opening up opportunities to make available specialized expertise to individual micro-entrepreneurs and small farmers at relatively low cost. In particular, the provision of personalized **advice online**, where users determine the kind of information they need

and interact directly with advisors, is a promising emergent application. Advice is available for a fee from Google Answers (<http://answers.google.com/answers/>), at US\$ 2.50/query. Agricultural extension advice online services are also being experimented with in India, by the International Institute of Information Technology, Hyderabad, (<http://agriculture.iiit.net/agrids/>); by IIT-Madras, and n-logue Communications (www.n-logue.com/services.htm; Box No. 5) and by Chile's Technical Cooperation Service (www.redsercotec.cl; Box No. 6).

Text Box No. 5. Technical Assistance through Videoconferencing

Because India is a land of many languages, a purely text based system of advice online (as Chile's Redsercotec) would be impractical. Instead, n-logue's provision of technical advice using ICTs uses a low bandwidth videoconferencing application developed by IIT Madras and commercialized by Oops (www.oops-india.com/), as well as through the exchange of highly compacted videoclips.

An advice online system along the Chilean model would be suitable for Viet Nam given its high literacy rates. Further, it has become customary for Vietnamese decision-makers to consult the public on proposed changes in rules and legislation.

The advice categories in Viet Nam could include a broad range of areas: Agriculture, Forestry, Fisheries, Quality Control, Training, Entrepreneurship, Financing, Legal Advice and Marketing. The system would enable farmers and rural producers and traders to assess their readiness to penetrate new markets, and to identify commercial and legal requirements for tapping these markets.

Text Box No. 6: Chile's Advice Online Service

The experience of Chile's Technical Cooperation Service, SERCOTEC, with advice online stands apart from other online business development service initiatives. First, Redsercotec is a public service provided at no charge to small and micro-entrepreneurs. Second, it is directed to serve not just a narrowly defined group (e.g. farmers) but all of Chile's small entrepreneurs with a broad range of interests and needs for information and services (e.g. legal advice, training, entrepreneurship, information on specific sectors like agriculture). Third, to be able to meet a broad range of interests, SERCOTEC has partnered with many other institutions to provide expert advice. Fourth, the system has been operational since March 2002 and was upgraded in 2004, and SERCOTEC thus has had time to garner experience. Through trial and error and careful monitoring, the agency has drawn on this experience to increase reach and effectiveness. Fifth and most importantly, the system is low cost, easy to implement and requires low maintenance. It has significant potential for replication elsewhere, to help public agencies increase their reach and become more citizen-oriented, transparent, and accountable at reasonably low cost, provided minimum conditions of literacy, a single language and access to ICTs apply.

Users registered in Chile's Redsercotec's website may send specific queries to any one of about 90 specialists (57 SERCOTEC staff members plus those of 29 partner public and private institutions) covering 45 thematic areas. An answer to each query is given within 48 hours. Upon receiving the advisor's reply, users are invited to rate the response on a 4-level scale from excellent to unsatisfactory.

To submit a query users first need to register in the system. Registration enables Redsercotec to better know its online clients. At end of May 2005, there were a total of 29,187 registered users. The face to face clientele of Sercotec numbers 10,000; the number of Redsercotec's registered users as of July 2005 is nearly 30,000.

(Proenza *et al* 2006)

Unlike other kinds of e-government services (e.g. land administration), no major re-engineering of procedures would be necessary to set up the system; but success will require political determination to institute the system and to encourage staff participation. Chile's system is managed by a small office staffed by three people and costs of development and maintenance are low. In Viet Nam, as mobile phone penetration in rural areas expands rapidly, the system's adaptation to mobile phone service through sms could be ground-breaking. To curtail any excessive demand, the sms service could be delivered for a fee.

Success Factors and Constraints

Success Factors

There are some promising initiatives but no clear cut examples of public service ICT applications that increase agricultural market service delivery and manage to keep the public sector engaged. There are also promising private sector initiatives, but it is still early to say whether they will enable entrepreneurs to earn a competitive return on investment and continue operating.

The most conclusive evidence shows that mobile phones enable farmers to search for the market information they need at low cost. When farmers and the trader community have phones, farmers engage in successful arbitrage and coordinate their supply response and their sales. In the process, they earn higher incomes, and price variability and the cost of market intermediation declines (Box No. 3). **A key success factor for increasing market information is therefore deepening rural mobile phone penetration.**

When it comes to packaged applications developed and managed by the public sector or by private firms, defining success factors is difficult because there are no clear sustainable successes to point to. In general, ICT initiatives that encourage greater interaction between citizens and the public sector and that make government and individual staff more transparent, responsive and innovative to citizen's needs (e.g. Boxes No. 5 and 6) should be encouraged, as they are likely to help producers carry out their own search in order to service their individual requirements for market information.

Constraints

World wide, the sustainability of publicly sponsored Market Information Systems has been challenged on two fronts. First, **institutional sustainability** has been difficult to achieve because the agencies entrusted with MIS operation are usually also responsible for many other functions. When budgetary allocations are made, farmer services often receive low priority. This is particularly true when agencies cannot show, for example through user satisfaction surveys, that the services provided are effective and appreciated by farmers. Second, achieving financial sustainability has been difficult because of the high costs of producing and disseminating reliable timely data using traditional media.

Given negligible farmer access to ICTs, MIS in Viet Nam have relied on traditional media to disseminate information. Dissemination using public TV stations has been a low-cost option enabled by government run stations. In most market economies, however, commercial TV broadcasting is expensive. As Viet Nam's reliance on market forces expands, the cost of disseminating MIS data using broadcast media is likely to rise.

Ultimately, the principal obstacle in the way of effective MIS applications is in the very **nature of farmers' market information requirements**. Farmers demand for market information is very particular. It varies by product and depends on the individual farmer's location. Each producer is in the best position to identify the specific nature of the information they need which in practice means that there are almost as many information requirements as there are farmers.

The quality of market information is also dependent on the trust that farmers have on its source. Farmers trust neighbors, family and friends who are familiar with conditions in a given market, more than they are likely to trust a website or a system generated text message. Up until recently the costs of such exacting market information search have been prohibitive, but once there is widespread access to telephones they enable immediate low-cost market search (Box No. 3). With only 3% of rural penetration of telephony in 2005 this is still a major constraint to information delivery through telephones, but the situation is rapidly changing.

Other constraints in Viet Nam with respect to MIS applications delivered online, is negligible Internet penetration in rural areas and limited digital literacy (i.e. the ability of the rural adult population to use the Internet).

A generally **weak public sector**, limited in its ability to innovate and more importantly, sustain innovative effective services, is another important constraint (Table A4).

IV. Land Information Systems

Land Administration and Land Management in Viet Nam

Since 1987 Viet Nam has undergone a remarkable transformation from centralized decision making and management of land use towards a market-oriented system that enables individuals and private enterprises to use land and transfer their land use rights to third parties. Initial measures in the late 1980s and 1990s focused on a sweeping and equitable reallocation of agricultural land from state managed cooperatives to individual farmers and led to major increases in agricultural production and productivity and a dramatic reduction in poverty (Dang Hung and Tran Nhu 2006; Duc Doi, Chinh Dao and Hyde 2006).

Three land laws (1987, 1993 and 2003) and supplementary legislation have gradually afforded increasing protection to the rights of individuals and private non-state entities to use, sell, mortgage, transfer, inherit, and lease residential and production land. The State however remains the owner of land and maintains an active role in land use management through land use zoning and planning for three broad categories of land: agricultural land, land for non-agricultural use and unused land for which its vocation remains undetermined (National Assembly 2004). Land Use Certificates (LUCs) are issued to households depending on the use-classification of the land; e.g. for 20 years in the case of annual crop land; for 50 years in the case of perennial crop lands; long term (forever) in the case of residential land (Dang Hung 2005; Duc Doi, Chinh Dao and Hyde 2006).

The State's role as protector of land use rights is also recognized by the Law. A four tiered (national, provincial, district and commune) system of land administration has been set up. The General Department of Land Administration (GDLA) of the Ministry of Natural Resources and Environment (MONRE) is responsible for surveying and mapping of land and the issuance and administration of LUCs (Duc Doi, Chinh Dao and Hyde 2006).

The system's operation is the responsibility of provincial, district and commune offices. Individuals deal with communal and district land offices; organizations and enterprises deal with provincial offices. In principle every one of the country's 600 districts should have a land office, but districts where very few land transactions occur do not really need one. As of February 2007, about 389 Districts had a land office. Leasing and mortgaging of land may be carried out at the commune level. Land sale requires registration at the District office. The law empowers the People's Communal Committee to function as a notary, to prevent the interested parties from having to travel to visit the District Office Notary.

The land registration and land management system that Viet Nam is developing (MONRE 2006) will need to be affordable in relation to the benefits it provides. If the system is too costly, citizens will bypass formal registration. The system must also be trustworthy and protect the rights of third parties such as banks and future purchasers of land use rights who will rely on information recorded in the registry to reduce the cost of investigating the validity of purported land rights and purging invalid claims. Developing affordable trustworthy land registration commonly requires a unified land code applied by a single institution following simple procedures that are low cost to the institution as well as to citizens (in terms of cash costs as well as their time), and a reliable system for recording information about land rights, including subsidiary rights such as mortgages and liens.

Some of the major challenges outstanding may be summarized as follows.

Access to land for entrepreneurial initiatives is presently a constraint, in part because the priority has been to allocate land to small farmers and also because the procedures for allocating land to business initiatives are cumbersome, lacking in standardized guidelines and time consuming (Vietnam News 2007, Duc Doi, Chinh Dao and Hyde 2006, page 6).

The adoption in July 2006 of a separate Housing Law prescribing urban land registration by the pertinent Department of Construction operating under the Ministry of Construction is bound to create confusion.¹⁰ Having two parallel registration systems is likely to lead to conflicting property rights records, increase opportunities for corruption and subtract public trust from both systems.¹¹

Present land taxes and levies are high and tend to foster informal land trade. Land registration records are out of date in most provinces and processing is time consuming, further encouraging informality. There is little information on the extent of the informal land market, but some observers suggest as many as 60% of all transactions may be involved (Duc Doi, Chinh Dao and Hyde 2006, page 6).

MONRE's land registration system keeps records in 4 books: a land parcel book; a cadastral book listing all end users and the parcels over which they have user rights; a land tenure certificate book where a record of LUCs issued is kept; and a land transactions registry. In principle every District, every province and every commune has a replica of each of these 4 books, but in practice there are discrepancies in the books and data kept at these different levels. This is a potential threat on the system's reliability that must be overcome.

Presently, a household wishing to sell land will first need to take its certificate to the People's Commune Committee. After collecting a small stamp tax and verifying that the land use certificate is compatible with what occurs in the field, the People's Commune Committee will sign the transfer papers and the seller and buyer will take these to the District Land Office for recording. The process is complex and time consuming, particularly for small farmers who may wish to mortgage their land to borrow a very small amount.

Land zoning and land use plans have been valuable instruments for allocating land to farm households and for protecting the environment. In practice the application of these plans has not been uniform and at times has been too restrictive of the uses which farmers can make of the land. The Law for example does not allow households to convert land designated as agricultural lands to non-farm uses, nor does it enable a farmer to sell his user rights directly to investors (Duc Doi, Chinh Dao and Hyde 2006, page 5). Land use planning appears to have been particularly lagging and limiting in respect of forest lands.¹²

Bac Ninh Province's LIS Experience

Bac Ninh province (www.bacninh.gov.vn/Main.html) is situated about 30 km from Hanoi. It is the smallest province in Viet Nam (807.6 km²) and with an estimated 1,000,000 people it is also the most densely populated. The province has 7 rural districts and 125 communes. Bac Ninh city is the provincial capital and is administratively run as a separate municipality.

Bac Ninh has one of the most active e-government initiatives in the country. Twenty one Local Area Networks (LANs) have been established to serve government agencies and another seven to serve districts outside the capital city. An Optical fibre network connects departments with the province's Data Integration Center. The province also has 148 post office culture points all of which are connected to the Internet (VietnamNet Bridge 2006).

Each district in Bac Ninh province has its own land office. Collection of land registration data started in the province back in 1992. Then in 2004, the Provincial Land Office developed and received approval from the People's Committee of a project to digitize, computerize and make land records available online. The project was completed between 2004 and by April 2006 all of the land administration information was made available online (at www.sotnmt.bacninh.gov.vn).

The system's data input is divided into textual information and geographic information. Textual information comes from cadastral books, the land parcel book and the land tenure certificate book and transactions registry. Geographic information comes from the provincial cadastre. For about half of the plots mapping information available is in the 1:200,000 mapping scale used back in 1994 and are not compatible with the more precise standards presently used by MONRE.

The system has helped streamline Government land administration and land use planning. Consistent information is now available at the provincial level database covering information from all communes and districts. The biggest impact has been in terms of promoting information exchange between government agencies. One of the most frequent users of the system is the department of construction as an aide in planning construction projects. Other departments also use this information and the maps as baseline for their own information systems: utilities, transportation.

Notwithstanding the system's achievements, as often happens with large computerization projects (Proenza 2006) the system is also facing challenges. Some of these challenges are common to LIS initiatives. Their resolution depends on local conditions, even if addressing them is costly or time consuming.

Security of the database is a major concern, from attacks from hackers or from unauthorized alterations in the records either by mistake or attempted fraud.

Existing software is considered outdated. Provincial officials consider there is a need to upgrade the software but lack the resources to do so.

The lack of training staff in computers and lack of equipment limits transmission of the data electronically. The province will have to expand the LAN and provide intensive training to staff at all level in the use of computers and the Internet.

For about half of the database commune level textual information cannot be linked with map information. In these cases the Land Use Rights certificate was issued before the mapping was carried out. Farmers know where their land borders are and presently there is no conflict between farmers, but the data cannot be linked. In the future if a land dispute arises, this could lead to an actual problem that will be difficult to solve. Technically this is not difficult to resolve, but updating the cadastral maps is costly (estimated at about US\$ 6 million).

The more difficult challenges are those that will require adjustment in institutional procedures.

Online publication of the system's data was closed after only two days (14-16 April 2006) in response to numerous complaints received from people concerned with privacy and possible repercussions of making sensitive information about people's assets widespread. The provincial government is trying to determine what kind of the information should be accessible via the Internet. Discussions with the People's Committee are expected to give clear guidelines as to the kind of information and under what conditions the information should be put online.

When transactions (e.g. sales, mortgages) are made in a given district the paper documentation is sent to the province and the database is then updated. In practice, the paper documentation is sent to provincial offices irregularly, perhaps monthly. As land transactions expand, this lag in the database could generate confusion and open opportunities for fraud. Reliability and security in the network is in part to blame as is lack of trained staff at the district level. Surprisingly, no use has been made to date of the extensive network of 148 Post office culture points with access to the Internet already in place, for either data transmission or staff training.

Service fees collected at the provincial level land office amount to DNG 1 billion per year or about US\$ 63,000/year. Out of this amount the provincial office can keep 20-40% depending on the type of service. The fees retained by the province are insufficient to maintain and upgrade the system. A review by Vietnamese authorities of fees collected and of the level of retention at different local levels for use in the maintenance of a secure land records database and recurrent upgrading of the LIS is needed.

Is there Widespread Demand for LIS Services in Viet Nam?

The long term potential demand in Viet Nam for Land Information System (LIS) services is enormous. Two broad categories of users may be identified.

Demand from citizens is the more important category, in respect of size and of its potential impact on national growth and development. It is a demand derived from the citizen's need of a trustworthy system of property registration and information on property rights. Demand is highest in urban areas, but is increasing in rural areas as these become better integrated to the market economy. Servicing this demand at low cost using LIS, could make a significant impact on the development of real estate and credit markets in Viet Nam.

Government officials, decision-makers and urban planners presently use a variety of ad hoc often non-standardized GIS and mapping applications for land management purposes. Their effectiveness would increase considerably if they had access to a reliable land inventory with information on who has rights over land stored in an interoperable database available online that seamlessly linked textual and mapping information.

Viet Nam's LIS supply to date has been very limited, the most extensive apparently being the Bac Ninh province's system. Its scope and limitations have been previously described.

Success Factors and Constraints

Success Factors

Land Information Systems can make an important contribution to land administration and land management in Viet Nam, but for maximum effectiveness careful crafting of the institutional setting will be necessary. Experience from Thailand (Box No. 7) and elsewhere (Proenza 2007) offers important lessons in this respect.

First, a single agency that unifies land registration with land valuation, tax collection and mapping, is in the best position to create a system of land administration that runs efficiently, even if it runs at a relatively low level of computerization.

Second, advanced land information systems that make enable citizen use of the Internet can help lower costs and increase rural services significantly; e.g. by providing seamless integration of data, reducing the distance that citizens must travel to register transactions and enabling e-conveyancing.

Third, land administration systems can also serve as a foundation from which to build land management systems (as in Suphan Buri province in Thailand) to help plan local government interventions with greater precision and in reference to specific persons or enterprises occupying the land.

Fourth, Governments do not always develop LIS even when they can yield clear benefits to citizens and even when the land administration functions generate substantial amounts of revenue. Leadership from staff and decision-makers and encouragement and technical assistance from donors may be necessary.

Constraints

Information systems can make an important contribution to land administration in Viet Nam, but their impact will be limited unless the institutional challenges previously outlined – with respect to land administration and to the prototype information system developed in Bac Ninh – are addressed.

Text Box No. 7: Land Administration and LIS in Thailand

The Thai population is predominantly rural - 68% compared to 37% in the Philippines (Table A1). Registering urban property in Thailand takes less than two days (Table A14) and not much more in the countryside. Beyond those living in forest lands, the great majority of people enjoy secure land tenure. Efficient as it is, land administration in Thailand is carried out predominantly using manual procedures. The Department of Lands (DOL) has 880 offices distributed throughout the country, of which about 50 Provincial offices are fully computerized. The District offices perhaps use one computer in the front desk, but only to automate the more routine operations. The DOL however has no integrated database and its online services are limited (e.g. downloading of forms, respond to online queries from customers).

Efficient land administration in Thailand is the result of a sensible institutional setting for land administration and simple, secure, customer service oriented procedures. When the World Bank 20 year 3-loan program started in 1984 Thailand already had a sound institutional framework. Since 1901 the DOL has had responsibility for all aspects of land registration, including cadastral mapping and registration of land rights; and in 1981 DOL was given responsibility for a Central Valuation Authority. Registration of land in Thailand requires no intermediation by notaries, lawyers or the court system. The World Bank supported program's achievements were to expand the cadastre, introduce customer service focus and invest in a huge expansion in rural land titling. The number of titles increased from about 6 million before the program, to over 30 million presently. Efficiency also increased: DOL staff numbered 15,000 before the project and only 11,000 presently. The total amount collected by DOL on government's behalf (registration fees & taxes) amounts to about US\$ 1.37 billion annually. The annual amount used by DOL to run operations is about US\$ 91 million.

The DOL system has limitations. Transactions must be registered by contracting parties in the province where the land is located. The DOL is now implementing a 3-5 year program to computerize all Provincial land offices (about 300 remaining), prepare digital cadastral maps, set up automatic data entry in 15 sites, expand Online services which are presently very limited. The estimated cost of the LIS project is US\$ 10 million. Another longer term project envisages a paperless land office in every province, for a total cost of US\$ 350 million.

A third notable LIS initiative by the Government of Suphan Buri Province (about 100 km from Bangkok) helps plan local and national government interventions. The system, for example, proved to be very valuable in programming post-Tsunami assistance by enabling the swift identification of property owners in the affected areas.

V. Emerging Policy Roadmap

Role of Private Sector, Government and Donors

ICT applications in the three areas considered can contribute to sustainable rural development in Viet Nam. Furthermore, a view of the proper role of the public and private sectors and of donors begins to emerge (Table A6).

Wireless Financial Services

In countries where m-banking has advanced (e.g. the Philippines South Africa) **the private sector has been the dynamic force driving wireless financial service innovation and development.** Private provision of m-banking services is high impact, profitable and self-sustaining.

In Viet Nam, where State owned enterprises are dominant in the provision of both telecommunications and banking services, there appears to be not much interest in, or pressure to develop, wireless financial services. This contrasts, for example, with Lao P.D.R., where precursor financial services (e.g. electronic air time load, electronic sharing of air time between customers) are more advanced than in Viet Nam, probably because their development is driven by a competitive challenge from a fast growing private operator.¹³

Government can support wireless financial sector development in several important respects.

First, it can stimulate greater competition in both telecommunications and banking services. This is likely to require greater participation from private capital in part from foreign investors.

Second, government can support an expansion in rural telephony through smart subsidies to help private entrepreneurs develop rural infrastructure. To further increase competition the leading operator should probably be excluded from such contests.

Third, Government will need to develop a suitable financial regulatory framework for m-banking services. Central Bank authorities need to develop a framework that protects consumers from undue risks, fraud or crime and ensures that service providers adopt adequate risk management measures; while at the same time facilitates and encourages innovation in financial service development, in particular to better serve rural communities.

Donors can support the Vietnamese Government through technical assistance to help increase competition by developing suitable regulatory frameworks for banking and telecommunications, and through loan and equity financing to expanding rural telephony and develop wireless financial services. They can also help disseminating good practices, promoting the exchange of information between countries and by providing seed funding to encourage new product development (technical assistance, training, performance testing and monitoring) to expand rural service.

Market Information Systems (MIS) and Services

Lessons of experience with Agricultural and Rural Market Information Systems are tentative. Farmers can be empowered by increased information on prices, greater marketing channels, and more market intelligence information. The Internet and mobile telephony in particular are drastically reducing the costs of providing these services. What is not clear is whether the costs of providing these services can be sustained by public agencies or even whether private enterprise can make a sustained profit without relying on government or donor support.

Promoting low cost access to mobile phones appear to be the best way to empower farmers with the ability to gather market price information from trusted sources that are relevant to their particular needs and to reduce intermediation costs and price variability. There is a role for both Government and donors in helping to develop rural telephony, as well as increasing Internet connectivity to expand farmer access to opportunities to establish new contacts through email and search for market intelligence information in the Web.

Further testing of MIS applications that promise to be self-sustaining should also be considered. It is not that important whether a public agency or a private enterprise leads the effort; public-private partnerships may in fact be a way to increase efficiency, leverage resources and spread risks. Selective donor support of the more promising initiatives is recommended. Donors should closely monitor and assess cost and benefits before up-scaling these efforts.

Land Information Systems (LIS) and Services

Government institutions have a direct role to play as arbiter of property rights and keeper of land records, but to date this task has been carried out only partially in Viet Nam. Land Information Systems can significantly increase the effectiveness of land information and land management services and Bac Ninh's experience is a useful example that can inform future developments.

The private sector has a role supporting LIS development. Its involvement must be in harmony with the essential requirements of land administration as a public monopoly service.

Donors have played a key role testing new ways to improve land administration service delivery, and helping Viet Nam develop an adequate institutional framework for land administration. As experience in other countries show, this is likely to be a long term undertaking in which donors can make an important contribution.

Promising Donor Interventions

International experience illustrates some donor approaches that have worked well in Viet Nam and suggests some promising new areas for donor intervention that could help expand information services to rural communities.

Wireless Financial Services

In Viet Nam, where m-banking is promising but not well known, **equity investment** from the International Finance Corporation into an m-banking venture could help i. increase competition if it also involves other private investors; ii. encourage involvement of local operators and commercial banks in the development of their own m-banking service platforms; and iii. help central bankers overcome any reticence there might be for lack of familiarity with regulatory requirements.

Loans from the World Bank or other multinational donors to finance smart subsidies in support of the expansion of rural telephony could also help increase mobile phone penetration. If it is properly designed and excludes the dominant operator from participating in the contest, such a loan project could also increase competitive pressures in telecommunications.

The USAID sponsored Micro-enterprise Access to Banking Services (MABS) Program (www2.rbapmabs.org) in the Philippines is another kind of intervention that could be suitable for Viet Nam. It is a relatively low cost but high impact model intervention that has shown how a program of **technical assistance, training, workshops and seed financing and the sponsorship of partnerships** between telecommunications operators, rural banks and central bank officials, can help extend the wireless financial services frontier to rural areas by encouraging an increase in the network of cash-in and cash-out m-banking outlets and by helping to develop new wireless financial products (e.g. text-a-deposit and text-a-payment) to lower the costs of rural microfinance.

Market Information Systems (MIS) and Services

Interventions **that increase mobile phone penetration** are most likely to yield high impact meeting farmers' demand for market information. Some of these interventions have been outlined in connection with wireless financial services.

For Viet Nam, there are also good reasons to consider **Agricultural Development Projects that include telecommunications infrastructure development components**. The ability of Vietnamese technical extension and research staff to communicate, network, learn and service farmers and traders is presently shortchanged for lack of rural connectivity and limited telephony. The separation between the two sectors is common due to tradition and in deference to donor's bureaucratic configurations. But the technical justification for separating sectors was never very strong and is less so now that the link between telecommunications and rural and agricultural development is better understood. Guatemala's Project to Support the Rural Economic Development Program (World Bank 2006) offers one example of a credit operation that supports telecommunications development (50% of total funding), together with agricultural marketing and trade (25%), general transportation (25%); and general agriculture, fishing and forestry (5%) in a well articulated fashion.

There appear to be no major initiatives to expand **market intelligence** delivery to farmers in a systematic and significant way in Viet Nam. Indonesia's **Farmers' empowerment through agricultural technology and information project** is an example that combines support to the country's extension service with the delivery, via the Internet and mobile phones, of market intelligence and technical services, and is expected to foster greater interaction between extension agents, researchers, farmers and traders.

The existence in Viet Nam of significant number of Post, Telecom and Cultural Points for Communes connected to the Internet and that are trying to achieve commercial sustainability, presents Viet Nam with an unparalleled opportunity to expand rural service delivery at relatively low cost. Installation of the centers, however, is only a first step. In rural communities, parallel **adult digital literacy** programs are usually needed.

Funding of digital literacy campaigns to train select low-income groups has become part of national efforts to further ICT development and is usually incorporated into broader ICT programs. In Korea, Government carried out mass media informatization campaigns (Park [2001]) and established Education Information Centers in schools and post offices, used to provide free or low cost information education to an estimated 10 million people, mainly students, government staff, soldiers and housewives (Lee [2002]). In

Chile, a national digital literacy campaign (Gobierno de Chile [2004]) in parallel with a significant expansion in telecenter facilities provided for digital literacy training of 500,000 people during the period 2003-2005.

Ongoing and future projects in Viet Nam should consider using the Post, Telecom and Cultural Points for Communes to train local government officials and entrepreneurs with simple computer literacy skills, and use these facilities to deliver services (market information, land information) to rural residents.

Land Information Systems (LIS) and Services

A long term program made up of **adaptable program loans** – as in Thailand (Box No. 7), Lao P.D.R., the Philippines, Honduras and El Salvador - could help Viet Nam expand land administration services and gradually develop the country's land information systems. The more sophisticated online services may take long to attain, depending on the country's ability to meet institutional and infrastructural challenges.

Unfortunately, policy-makers are often lured by sophisticated portals that provide online land administration services. What is not always appreciated is that most of these portals been set up only after a long institutional development struggle, the reengineering of procedures and significant legislative changes.¹⁴ To increase understanding among decision-makers and project planners, **studies, workshops and exchanges of staff** on LIS approaches, specialized LIS topics and Internet service requirements could be very productive.

Notes

1. The Central Bank of the Philippines has issued four Circulars detailing the procedures that institutions wanting to provide electronic banking services must follow. The first two, numbered 240 and 269, were issued in 2000 and envisioned a bank as the service operator. These circulars (esp. 269) describe the steps to be followed to approve an application to provide electronic banking services and lists the risk management measures that applicants must implement. The other two circulars were issued in 2006. Number 511 gives detailed guidelines for Technology Risk Management and proposes that banks' follow an integrated risk management process that involves planning, implementing and measuring and monitoring performance. Circular number 542 specifies rules e-banking service providers must follow to protect consumers from fraud, robbery, money laundering and other crimes.

Filipino Central Bank circulars may be downloaded from www.bsp.gov.ph/.

2. Churn rate is the proportion of subscribers that cancel their subscription. Any time-frame may be used but churn rates are often quoted on a monthly basis. A 3% monthly churn consistently applied over a 12 month period would result in a loss of nearly 30% of the initial customer base.

3. In the Philippines, the number of retailers used by Smart Communications went from 50,000 in May 2003 when its over the air e-load service was launched to 700,000 by the end of 2004. The company was also able to reduce commissions settled in the form of discounts for load time from 10% for prepaid cards to 5% for e-loads.

In Lao P.D.R. a private company, Millicom International Cellular S.A. launched its EZLoad air time loading service in November 2005 and by May 2007 had been able to increase the number of retailers from a few hundred to about 1700.

4. In Lao P.D.R., for example, the minimum recharge prepaid scratch card costs 20,000 Kips (US\$ 2.17), compared to a minimum electronic load using EZLoad of 5,000 Kips (US\$ 0.54).

5. "the edges of commercial microfinance are defined by cost structures of current delivery technologies" (Peck Christen 2006).

6. The description of the SUSPER MIS given here draws from Moustier 2006, Moustier 2006a, Phuong Anh 2006 and Phuong Anh and Mustier 2006.

7. "While in the general meeting, the preferred means of dissemination turned out to be the telephone as participants to the general workshop may be ones with easier access to telephone than the rest of farmers and traders. Television was more often quoted in the village meetings." (RIFAV 2006, page 35).

In The Philippines, during the MIS test period the Provincial Agriculture Statistics Officer for Bukidnon received several sms requests for price information from farmers, and respondents to an impact assessment survey suggested giving cellular phones to the agricultural technicians so that the Bureau of Agricultural Statistics officer working in the Agora market on market days could report of prevailing market conditions to these technicians and to the Municipal Agricultural Officers and they could then in turn inform farmers (FAO 2004).

8. "In reviewing the literature on the feasibility of the rural telecentres no reference to the Village Post Office and Cultural Centres was encountered. One wonders if there have been any lessons learned to date that could have been applied or have these cultural centres just disappeared from the radar." (Cunningham 2007, page 27)

9. A presentation (no author given) lodged in Asia Pacific Information Infrastructure website dated 2005 states "the number of PTCs having internet access: 268 (4% of total PTCs).

[www.apiicc.org/apiicc/Lecture/Special/National ICT Development Master Plan Project of Myanmar/020205.pdf](http://www.apiicc.org/apiicc/Lecture/Special/National%20ICT%20Development%20Master%20Plan%20Project%20of%20Myanmar/020205.pdf)

10. "Under the Housing Law, the house and land use right ownership certificate is to be issued by the relevant Departments of Construction. The Land Law, however, contemplates that the right to use land and assets on land is to be registered with and the land use right certificate is to be issued by the Departments of Natural Resources and Environment.

This issue must be reconsidered as we do not believe that both the Departments of Natural Resources and Environment and the Departments of Construction should issue separate documentation on ownership. This will lead to confusion and possible fraud in land transactions. In this regard, it appears that the Housing Law and the Land Law are inconsistent."

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11. The public's trust in the system of land registration is essential. Without trust the system is abandoned by citizens who resort to informal transactions (Arruñada 2003).

12. "In Tuyen Quant, households and land officials consider that people only have rights to plant trees without permission to harvest the trees!"

Dang Hung and Tran Nhu 2005, page 6.

13. Millicom International Cellular S.A., also known for its brand name, Tigo, is a private enterprise in which the Lao P.D.R. Government has a small stake of about 16%. The company started operating in April 2003 serving Vientiane exclusively but has gradually expanded to provide national coverage except for two provinces. It is the third most important operator in terms of market share serving about 10-13% of all mobile customers.

Tigo has started to provide precursor m-banking services to help the company reduce churn and lower distribution costs. First, the company launched in November 2005 EZLoad a service that enables Tigo retailers to pre-purchase air time credits from the company and then reload customers phones electronically phone to phone. Presently (May 2007), sale of EZLoad represent about 30% of air time sales value and 70% of sales still use scratch cards. Second, in November 2005 Tigo also introduced Balance Transfer, a service that enable customers to share air time loads electronically from one phone to another through simple text messaging commands. This service helps Tigo reduce churn and effectively makes every customer a potential retailer.

Millicom is also in discussions with the Postal service to provide remittance services within Lao P.D.R. at a lower cost using its electronic load transfer platform.

14. Computers enable the automation of simple routines, but for in order for information systems to have a significant impact, parallel changes in institutional procedures are usually required; i.e. a re-engineering of traditional ways of doing things is necessary (Brynjolfsson and Hitt 2003; Dedrick, Burbaxani and Kraemer 2002).

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Annex A. Tables

Annex A. Tables

Table A1. Selected Indicators, South East Asia

	Population			% Illiteracy > 15 yrs		% population earning less than US\$2/day	GNI per capita (2005)	Cellular subscribers per 100 people (2005)	% Prepaid (2005)	Mobile Cellular tariffs US\$ (August 2006)		
	Total (millions 2006)	% <= 19	% Rural	Male	Female					Per minute local call		SMS
										Peak	off-peak	
Cambodia	14.4	59.8	80	15	36	77.7	380	7.5	57.9	0.12	0.11	0.03
Indonesia	225.5	47.2	52	6	13	52.4	1,280	21.1	92.6	0.11	0.09	0.01
Lao P.D.R.	6.1	62.2	79	23	39	74.1	440	10.8	97.2	0.17	0.14	0.04
Malaysia	25.8	51.6	33	9	15	9.3	4,960	75.2	85.0	0.10	0.10	0.01
Myanmar	51.0	n.d.	69	6	14	n.d.	n.d.	0.3	n.d.	n.d.	n.d.	n.d.
Philippines	84.5	54.6	37	7	7	47.5	1,300	41.3	92.0	0.13	0.13	0.02
Singapore	4.4	28.9	0	3	11	n.d.	27,490	100.8	36.7	0.14	0.14	0.03
Thailand	64.8	37.8	68	5	9	25.1	2,750	43.0	51.8	0.05	0.05	0.08
Timor-Leste	1.0	n.d.	74	n.d.	n.d.	n.d.	750	n.d.	n.d.	n.d.	n.d.	n.d.
Viet Nam	85.3	48.3	74	6	13	n.d.	629	11.4	80.5	0.15	0.15	0.02

Sources:

State of World Population in 2006, UNFPA www.unfpa.org/swp/

US Census Bureau - International Data Base: Population Pyramids www.census.gov/ipc/www/idbpyr.html

World Bank - Key Development Data and Statistics

<http://web.worldbank.org/WBSITE/EXTERNAL/DATASTATISTICS/0,,contentMDK:20535285~menuPK:1192694~pagePK:64133150~piPK:64133175~theSitePK:239419,00.html>

Data on % of population earning less than US\$ 2/day is from various surveys taken between 1997 to 2002. See World Development Report 2007

ITU 2007: www.itu.int/ITU-D/ict/publications/ict-oi/2007/index.html

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Table A2. Causes of Poverty Frequently Cited by the Poor

Cause	Percentage of Poor citing this cause
Lack of capital for production	79
Lack of production knowledge	70
Lack of market information	35
Diseases and illness	32
Lack of land for production	29
Too many children	24
Unemployment	24
Bad luck	6
Family members involved in 'social evils'	1

Source: The Socialist Republic of Viet Nam, the National Target Program on Poverty Reduction (NTP-PR) 2006-2010, Hanoi 2006

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Table A3. Protocol for Hanoi vegetable price information system

Nature of data	Wholesale prices, retail prices
Frequency	Daily
Products:	tomato (local + imported) cabbage (local +imported) Choy sum, Chinese cabbage kangkong; wax gourd; green bean; eggplant, cucumber; fit weed Includes quality grading for all vegetables
Project areas (major suppliers of vegetables to Hanoi)	Tien Duong (Dong Anh, Hanoi) Dong Du (Gia Lam, Hanoi) Tien Phong (Me Linhn, Vinh PHuc) Vo Cuong (Bac Ninh)
Markets (data collection points)	Wholesale prices: Long Bien, Den Lu, Dich Vong Retail prices : Thang Cong (prices are intermediary between Mo, popular market, and 19-12, wealthy market); Cuu Viet (peri-urban market)
Method of collection	Collection by one contact trader in each market Price data is collected from 3 traders per market 4 a.m. wholesale markets and 9 a.m. retail market
Data transfer market to RIFAV	contact traders in market to RIFAV by telephone at 10:30 AM every day
Data collection control	every 7 days unannounced data is checked at the market and data collectors' logs are inspected.
Data tables prepared by RIFAV	In Exel format; includes simple comments on up or down trends
Data transfer RIFAV to ICARD & HDARD	by fax/Internet on same day data is collected
Data storage at ICARD	Oracle
Data transfer ICARD to TV Stations	by fax/Internet
Data posted by ICARD in website	www.agroviet.gov.vn Data loaded every day 10-12 AM.
Data broadcast by VTV2	3 times a day (7:30 AM, 6:30 PM and 23:30 PM) TV reports on Tuesday-Thursday cover data collected on the previous Saturday through Tuesday TV reports on Friday-Sunday cover data collected on the previous Wednesday through Friday.
Data broadcast by Hanoi TV	at 5 PM on Tuesday, Wednesday and Friday
HDARD informs contact farmers	by telephone or fax (same day data is collected)
Contact farmers in 4 project areas disseminate information	local megaphone system in the 4 project areas (daily or every two days)

Sources: Moustier 2006, pages 24-25; Phuong Anh 2006, page 107; Moustier 2006a pages 127-129.

Table A4. South East Asia Country Rankings According to Competitiveness, Institutions and Corruption Perceptions

	World Economic Forum 2006		Transparency Int. Corruption Perceptions
	Global Competitiveness	Institutions	
Cambodia	103	95	151
Indonesia	50	52	130
Lao P.D.R.	n.d.	n.d.	111
Malaysia	26	18	44
Myanmar	n.d.	n.d.	160
Philippines	71	88	121
Singapore	5	4	5
Thailand	35	40	63
Timor-Leste	122	119	111
Vietnam	77	74	111

Sources:

www.weforum.org/en/initiatives/gcp/Global%20Competitiveness%20Report/index.htm
www.transparency.org/policy_research/surveys_indices/cpi/2006

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Table A5. Cost of Registering Urban Property in East Asia

	Ease of Doing Business Rank	Registering Property Rank	Cost of Registering Urban Property		
			No. of procedures	Time (days)	Cost (% of property value)
Cambodia	143	100	7	56	4.6
Indonesia	135	120	7	42	10.5
Lao P.D.R.	159	148	9	135	4.2
Malaysia	25	66	5	144	2.4
Myanmar	n.d.	n.d.	n.d.	n.d.	n.d.
Philippines	26	98	8	33	5.7
Singapore	1	12	3	9	2.8
Thailand	18	18	2	2	6.3
Timor-Leste	174	172	n.d.	n.d.	n.d.
Vietnam	104	34	4	67	1.2

Source: World Bank, Doing Business in 2006 www.doingbusiness.org

Note: Poorest performers had a rank of 175 for Doing Business and 172 for Registering Property.

Table A6. Emerging Roadmap of Roles of Public and Private Sectors and Donors

	Regulatory and Legal Framework	Innovation, Service Development and Investment
Wireless Banking		
Government	develop financial regulation foster competition, in telecom and banking sectors support m-banking innovation	Stimulate greater private investment in rural telephone development through smart subsidies.
Private Sector		develop and invest in secure customer service application compliant with Central Bank regulations.
Donors	Technical assistance and training to improve telecom regulation	Equity investment in m-banking (IFC) Credit financing of smart subsidies to develop rural telephony Provide seed money to encourage pilot testing of rural microfinance services. Dissemination of know how
Agricultural and Market Information Systems, MIS		
Government	promote telecom competition and increase rural telephony provide interactive market intelligence services	Use existing Post, Telecom and Cultural Points to deliver market information & other services; digital literacy training experiment with applications dev. partner with private sector.
Private Sector		develop and invest in applications to serve rural areas develop sustainable (profitable) rural Internet access points
Donors	Tech. assist. and training to improve telecom regulation	Seed funding for pilot testing and dev. of rural service.
Land Information Systems, LIS		
Government	land titling institutional reform	Develop applications (e.g. cadastre index map, valuation, sms) Use public Internet access points to update land records
Private Sector	stakeholder participation in governance of land administration agency	develop and install applications under contract to State Land Admin. Agencies.
Donors	Provide Technical assistance and training to improve land titling institutional and legal framework	Long term program loans for land administration Fund investment and tech. assist. to develop LIS services.

Annex B. m-Banking: Key Financial Regulation Issues

The key financial regulatory issues that a country's central bank needs to address in relation to m-banking are:

- i. how to protect the public from fraud and ensure a reliable, continuous and secure service;
- ii. how to prevent technology risks from severely affecting a bank's capital or earnings;
- iii. how to regulate financial service providers that are not banking institutions; and
- iv. how to prevent the use of the new electronic platform for illegal money laundering activities .

The Central Bank will need to build up its capacity to understand and regulate risks associated with the electronic banking services. It might find it useful to create, as was done in the Philippines, a Core Information Technology Supervisory Group within the Bank. The steps to be followed in order to approve an application to provide electronic banking services will need to be defined, and a list of the risk management measures that applicants must implement will have to be specified.¹

Some of the requirements that applicants should meet are the following:

- i. demonstrate that adequate risk management procedures and monitoring systems are in place;
- ii. show that a manual describing corporate policy has been prepared addressing all security issues associated with the service (authentication of sender and receiver, non-repudiation of transactions effected, enforces access rights of parties involved, assures data transmitted wirelessly is not altered and that no one other than the transacting parties can understand the data);
- iii. give evidence that the system has been tested and these tests have yielded satisfactory results; and
- iv. present a business plan detailing banking channels and systems and providing for continuity of the service has been adopted.

In the same way that mobile telephone service operates predominantly on a pre-paid basis (97.2% in 2005, Table 1), m-banking in Viet Nam will also be pre-paid. Accordingly, at any one time the mobile operator providing m-banking services will be

¹ The Central Bank of the Philippines has issued four Circulars detailing the procedures that institutions wanting to provide electronic banking services must follow. The first two, numbered 240 and 269, were issued in 2000 and envisioned a bank as the service operator. These circulars (esp. 269) describe the steps to be followed to approve an application to provide electronic banking services and lists the risk management measures that applicants must implement⁶. The other two circulars were issued in 2006. Number 511 gives detailed guidelines for Technology Risk Management and proposes that banks' follow an integrated risk management process that involves planning, implementing and measuring and monitoring performance. Circular number 542 specifies rules e-banking service providers must follow to protect consumers from fraud, robbery, money laundering and other crimes.

Filipino Central Bank circulars may be downloaded from www.bsp.gov.ph/.

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Annex B. m-Banking: Key Financial Regulation Issues

holding a considerable amount of funds from its customers. This is why a regulator evaluating an m-banking application from a mobile operator wishing to provide the service on its own without direct link to a bank, meet the following conditions:

- i. it is a financially sound company;
- ii. the systems and network used by the company are secure, robust and reliable and has in place procedures for addressing emergencies;
- iii. the funds involved are relatively small in relation to the financial capacity of the firm; and
- iv. the company is capable of managing the risks associated with providing the service without posing a significant threat of abscondment or loss of customer funds.

The Central Bank will need to assume a “de facto” regulatory function over the company and the latter must in turn accept to give the Central Bank regular oversight access to its systems, procedures and database. Before approving any new m-banking services, Central Bank staff should work closely with the company to ensure that secure reliable procedures are used.

Sample regulatory requirements applicable under either of the two entrepreneurial options include:

Know Your Customer (KYC)	a key step for mobile banking is ensuring at the outset face to face interaction with the customer and that a photocopy of every customer’s picture is kept on file.
Anti-Money Laundering Requirements	in addition to KYC requirements, limits should be set on how much money can be transferred per day or per month
Text a deposit services	to ensure confidentiality of deposits, a deposit using this service can only be made to a licensed bank.
Expeditious approval of participating banks	Bank branches wanting to provide m-banking services (e.g. encashment, text-a-loan-payment, text-a-deposit) should be trained and certified by the Banking partner institution (or creditable banking association) as qualified to provide the service.
Strong encryption and masking of password	To prevent e-banking identity theft (as money is transferred in cyberspace or as a result of mobile phone theft), strong encryption algorithms must be used and the password entry is masked; e.g. showing *** instead of the alphanumeric characters entered by the customer.
Consumer protection	Customers must be made aware of the risks involved in using the service and the company must have disclosed procedures for handling customer complaints.