5 COMPONENTS OF THE MAIS IN ASIA

The workshop discussion next reviewed the various types of MAIS currently offered in countries across the region, especially those in which public institutions were actively engaged, and how government departments promote these initiatives. Policies and the role of the private sector were also explored. This section summarizes the major categories of service offered through the MAIS, the types of information provided and the dissemination mediums.

5.1 Market information (commodity prices and stocks)

Market price information, or market intelligence, is the most commonly offered content service in MAIS in Asia. It is typically provided in SMS delivery on a commodity basis. Such systems often have complex workflows involving networks of people collecting, organizing and delivering information related to prices and stocks of agricultural produce. The intended audiences include farmers, traders, merchants and others involved in the agricultural value chain. The information flow is unidirectional in the basic form of service where transactions are supported. Much study has shown that such systems provide farmers with a better economic return.

Country presentations cited several examples of market price information systems implemented by public and private sector actors.

- **Bangladesh:** The Bangladesh Sugar & Food Industries Corporation under the Ministry of Industries uses the SMS format to transact purchase orders of sugarcane to growers. The Department of Agricultural Marketing under the Ministry of Agriculture disseminates price and commodity information through its Web site. Banglalink, a mobile network operator, runs a call centre for agricultural market-based information.

- **Cambodia:** Agricultural Market Information[13] under the Agricultural Marketing Office has provided agricultural market price information services since 2006, starting first by using radio as a delivery medium but switching to SMS in 2009; the service now covers 14 regions.

- **India:** The Directorate of Marketing and Inspection under the Ministry of Agriculture has linked wholesale agricultural produce markets through its Agricultural Marketing Information Network (AGMARKNET)[14] initiative. The AGMARKNET database is connected to more than 3 000 markets around the country. The database is used to input real-time information from the markets, which then makes market price information through a call centre and through a Web site. Kissan Kerala,[15] Kisan Mobile Advisory Services by the Indian Council of Agricultural Research,[16] Nokia Life,[17] Reuters Market Light[18] and IFFCO Kisan Sanchar Limited[19] are other examples of services in India delivering price information through a variety of digital media, SMS and online.

  Additionally, the e-Choupal[20] initiative links directly with rural farmers for the procurement of agricultural and aquaculture products. Village Internet kiosks managed by farmers (called sanchalaks) enable the agricultural community access to information in local languages on the weather and market prices, disseminate knowledge on scientific farm practices and land risk management, and facilitate the sale of farm inputs.

- **Philippines:** The Agriculture and Fisheries Market Information System[21] under the Department of Agriculture delivers market information through the Internet and SMS. Text Presyo and the Farmers Helpline provide the market price details.

- **Sri Lanka:** The Hector Kobbekaduwa Agrarian Research and Training Institute[22] under the Ministry of Agriculture provides price information on wholesale and retail vegetables, while private sector actors, such as Mobitel Ltd and Dialog Axiata (both MNOs), have entered into public–private partnerships to deliver spot prices through SMS and USSD on mobile phones.

5.2 Meteorological Information

Weather-related information is another major category of content provided through various MAIS in Asia, generally through a unidirectional SMS format. The heavy dependence of farm families on weather makes this service valuable. However, in most instances, weather forecasts are provided at a district level,

13. See http://www.agriculturalmarketinformation.org.kh/en/agricultural-market-information/am-information.
14. See http://agmarknet.nic.in.
15. See http://www.kissankerala.net/home.jsp
16. See http://www.icar.org/
17. See http://press.nokia.com/services/369/ovi-life-tools/
18. See http://www.reutersmarketlight.com/index.html
19. See http:// www.iksl.in/
20. See http://www.echoupal.com/
21. See http://afmis.da.gov.ph/
22. See http://www.harti.gov.lk/

which are not always well suited to making informed decisions at a local level, considering weather patterns can vary within relatively small geographic areas. Localized weather stations at the village level could generate highly localized weather information and forecasts, but this would be an extremely challenging service to establish and maintain. Private sector actors seem to have a much more localized system of disseminating weather-related information to subscribers than the public system.

5.3 Advisory services: Time-bound interventions

Agricultural advisory services based on crop life cycles and crop calendars form another commonly offered information service delivered using mobile phones. A specific mobile telephone account/number is identified with a particular crop for a season, and regular advisory notices related to watering, fertilizer or pesticide application are disseminated through that number. This is effective only in instances in which there is a regularity and value in keeping to certain timetables and taking certain action at a specific time. These are predominantly unidirectional SMS-based services, but in some instances the advisory notices are voice-based, with an automated call delivering a pre-recorded message to the subscriber. These messages are also sent to government officials who are associated with farmers in those particular areas.

The Ministry of Agriculture and Agro-Based Industry[23] in Malaysia runs an online portal for technical advisories. Nokia Life has a similar information component that is available to its subscribers.

5.4 Advisory services: Technical information and Q&A services

One of the most challenging information services is the real-time advisory for agriculture. Many public and private institutions have invested heavily in creating efficient, real-time advisory systems. The creation of a comprehensive knowledge bank and the availability of qualified agricultural officers to address farmers' queries constitute a heavy investment at the onset but in the long run they reduce costs and increase efficiency. The knowledge bank can also be accessed by farmers and extension workers in the field to support their diagnosing of problems or decision-making. The following were cited during the workshop discussion as examples of such systems.

[23.] See http://www.moa.gov.my/web/guest/home

- **Bangladesh:** The Ministry of Agriculture employs SMS and interactive voice response (IVR) systems to offer agricultural advice. In the private sector, Banglalink and Grameen Phone have each established their own call centres to address farmers' queries.

- **China:** The Ministry of Agriculture's Farmers Mailbox[24] operates an integrated advisory service and the Ministry is working with Chinese telecommunication providers to complete a comprehensive information service programme.

- **India:** The Kissan Call Centre, which is a national initiative, provides an agricultural advisory service to farmers. The operations of Kissan Call Centre are in the process of being outsourced to the IKSL initiative. Several private sector actors have created their own knowledge banks to support agriculture extension services, such as Reuters Market Light, Nokia Life, ITC (e-Choupal),[25]IIT Bombay,[26] (aAQUA), Krishi Vigyan Kendra Baramati and Vigyan Ashram, AGROPEDIA (vKVK[27]).

- **Sri Lanka:** A toll-free number is provided by the Ministry of Agriculture through which farmers can seek advice from government extension officers. Dialog Tradenet, a service delivered by Dialog Axiata PLC (the MNO) and Govi Gnana Seva[28] offer market price information.

Most private initiatives often source their base information from government research agencies (state or national level); however, it has to be processed before being delivered in a particular context.

5.5 Early warning systems (natural disasters, pest outbreaks etc.)

Information is the key to preparedness; for agriculture, this could mean the difference between a successful or a failed harvest. Many effective models of early warning and disaster information systems to mitigate risks are found around the world, especially for natural disasters, such as tsunami, flood and earthquake warnings. In many instances, combined information advisories culled from very localized information received from people in close vicinity to an event is used to generate information/warning services. One of the most effective ways to disseminate such information is through the use of SMS. However, the challenge of using various language character sets in certain mobile handsets remains a problem.

Another information service delivered through mobile phones relates to pest and disease control. Mobile phones now provide an excellent delivery medium

24. See http://www.zjnm.cn
25. See http://www.echoupal.com/
26. See Indian Institute of Technology, Bombay at: www.iitb.ac.in/
27. See Voice Krishi Vigyan Kendras at http:// www.agropedia.net/
28. Govi Gnana Seva (Farmer Knowledge Service) is a not-for-profit organization engaged in the collection of wholesale price information of agricultural products. The Sri Lankan Government contributed funding during the early stages of implementation and continues to support its activities.

to disseminate important information to a wider audience in a short time. There have been many instances in which the mobile phone service has been used to track pest or disease outbreaks and to report specifics back to a central point that then sends out alerts or arranges for preventive action as the situation demands.

Other examples include information on avian flu, wild fire and a weather conditions warning system used in Viet Nam for farmers and fishers and the Center for Environment and Geographical Information Services in Bangladesh that delivers flood-related information through SMS.

The FAO Avian Influenza Information system (see Annex I) developed and implemented in Bangladesh is yet another example of how mobile technology contributes to active surveillance in resource-deficient situations. The real-time interactions to track the spread of the HPAI–H1N1 virus in Bangladesh, where the majority of poultry farms are in rural areas and not readily accessible to the national veterinary services due to the shortage of human as well as material resources, is an excellent example of the use of mobile technology for an early warning and disaster information system.

5.6 Financial services

In recent years, the mobile phone has transformed from a device meant for communication to an important gateway for financial transactions. In many countries, the phone is used as a virtual wallet to hold currency that could either be used for airtime (talk time) or for paying for services and products. In the Philippines, for example, the collaboration between the Rural Bankers Association of the Philippines' Microenterprise Access to Banking Services (RBAP-MABS) programme[29] and Globe Telecom's G-Xchange Inc., which operates the GCASH platform, has brought financial services to many non-banking Filipinos. The mobile money wallet called GCASH is used to pay for many day-to-day services, including remitting money back home. Migrant labourers use this service extensively to send remittances back home in a fast and economical way. Using mobile technology for financial services (mobile banking or m-banking) can considerably lower the overhead in financial transactions. The mobile wallet is extensively used in the Philippines, with 86 million mobile connections (almost 91.5 percent of the population). The process and the actors involved in such initiatives vary among countries, where in some instances a banking institution is involved and in others just the mobile network operator. Challenges, however, exist. In India, for instance, financial transactions through the mobile phone service are not legally binding because the Reserve Bank of India, the country's banking regulator, does not recognize them due to security issues.

. . . .
[29]. RBAP-MABS programme is supported by USAID/Philippines; see http://www.rbapmabs.org/home/

5.7 Traceability in agriculture

Agricultural producers are increasingly interested in adhering to food safety standards and in facilitating food traceability. This increases the effectiveness of identifying the source of an outbreak of a food-borne illness, to trace its path and to remove it from the supply chain. In China, many services have been established to address this issue and to facilitate traceability, although not yet through the mobile phone service.

5.8 Yellow pages/directory services

Information related to the availability of a fertilizer, pesticide or even such input services as transporters or harvesters is crucial for agriculture. The Sri Lankan Government Information Center provides such a service, connecting the caller to an information service provider. This particular service is based on dialogue and accessible to fixed-line and mobile telephones, but similar directory services are also offered over the Internet.

5.9 Specialized information

Malaysia uses SMS for internal information alerts specifically for senior government officials in the Agriculture Ministry, and Bangladesh's Department of Agricultural Extension sends administrative messages via SMS to field-based extension officials.

5.10 Data gathering

Mobile phones are not only used as a delivery medium but also as a node to collect data, which is then processed by a centralized unit to produce information services. Examples include the Avian Influenza Preparedness and Response Project in Bangladesh and a system in the Philippines for price and stock information gathering by the Bureau of Agricultural Statistics. Both of these examples use an open-source system from Nokia. Similarly, the Govi Gnana Seva NGO in Sri Lanka uses mobile phones to collect price information that is recorded and made available in real time. The Chinese Center for Disease

Control and Prevention set up a mobile phone emergency reporting system that takes about two to three minutes for a trained person to report a possible epidemic-related case.

Generally, the limitations of mobile phone displays in terms of size and text-based systems restrict the collection of advisory types of information. However, text used in combination with voice-based information seems to offer effective options for an advisory information exchange.

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6 CREATING AN ENABLING ENVIRONMENT FOR MAIS

6.1 Policies and partnerships for information dissemination in agriculture

The workshop participants discussed the policy dimension of an MAIS. Ensuring the quality and accuracy of information disseminated through an MAIS is a prime responsibility of government and the public sector. Despite the importance of MAIS policies, none of the countries participating in the workshop have a specific policy related to MAIS, although most countries have ICT policies that include generic guidelines on the use of mobile phones.

Because MAIS do not involve face-to-face interactions, trust plays an important role in whether or not the information received through an MAIS is acted upon. The trust factor associated with voice-based MAIS was mentioned as the reason that the advice received had a much higher rate of adoption than SMS or IVR systems, as evidenced in LIRNEasia's research. Among the workshop participants, there is ardent belief that there should be strong policies for respective government agencies to validate the content and information disseminated and also to take responsibility for the correctness of information.

Pesticide application information and market prices in particular demand highly reliable data. In these instances, wrong information would directly lead to lost revenue and a negative impact on livelihoods.

The absence of MAIS-specific policy in a country is likely a consequence of communication policy being handled by a communications ministry, while policies related to agricultural advisory services are the domain of the agriculture ministry. Governments have a responsibility to ensure that all public

agricultural organizations from the national down to the local level have access to connectivity, but policy and/or guidelines are urgently needed on the quality and validity of information and data delivered through an MAIS.

In India, the National e-Governance Plan for agriculture (NeGP-a) encourages universal access to information and knowledge and advisories to be channel and technology neutral; it also includes policies on mobile-based technologies (voice, SMS, USSD).

The development of policies defining access to government data by private parties (not necessarily limited to an MAIS) is deemed essential. In many instances, governments have access to huge repositories of valuable data but lack the technology and means to disseminate this information to the intended audiences. The private sector is more adept at developing business models for such information delivery systems. A working partnership between public and private sectors can address these issues and play to each other's strengths. There are several instances in which a government has partnered with the private sector to deliver an MAIS (such as the IKSL initiative in India as previously noted previously).

For MAIS to be successful, evidence shows that policies need to allow for and accommodate roles for the various actors involved, including:

- mobile network operators
- agricultural partners (content providers)
- telecommunications regulator (where relevant)
- any other parties involved in this workflow.

In relation to access and connectivity, the adoption of standards within an MAIS is critical so as not to exclude any group of potential beneficiaries due to incompatibility with handsets or versions of software, etc. In addition to supportive policies, an urgent priority for expanding the application of the MAIS is the determination of how effectiveness can best be measured through appropriate output (such as the number of users or frequency of use) and outcome indicators (such as tangible benefits for farmers or producers).

6.2 Case studies on private sector provision of an MAIS

The following examples were presented during the workshop to highlight innovative public sector provision of agricultural information.

BOX 1

Reuters Market Light

Reuters Market Light (RML) started in 2007 initially with four market parameters – prices, localized weather, crop and agricultural use – and scaled up to include irrigation, electricity, livestock schedules, etc. Interacting with a team of subject matter experts and other agencies, RML aggregates the data, checks the quality and then drafts the material to make the content usable.

RML provides information to leading institutions and banks around the world, particularly reaching out to people at the "bottom of the pyramid" (the poor); it has reached out to farmers in India, for example. Farmers in India receive three to four messages a day that are personalized to their profile. RML sees itself as a content creator, aggregator and disseminator. At the onset, the creators were interested to aggregate and disseminate information but realized that content was not available. Hence, they have invested in finding people to generate content.

RML covers 13 states in India and targets medium- to large-scale farmers while also working closely with government agencies to reach other farmers. Because it is focuses only on the information platform and not the technology platform, the RML services are accessible through a prepaid SIM card (around US$2 per month); farmers can dial a toll-free number to register their profile (their interests, land size, crop passport data, previous crop, land irrigated or rain fed, etc.) and sign up for other services. The information that is delivered relates to each person's profile and stated need. A system to facilitate follow-up to the advisory or information is still being refined.

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BOX 2

Nokia Life

Nokia Life is a livelihood & life improvement service portfolio that covers a range of topics. It started with educational & agricultural services nearly three years ago, before expanding into other areas like health. The agricultural services entail: i) crop advisory information, tips and agricultural news; iii) market prices in the crops of choice and iii) weather updates and advisories.

Available in China, India and Indonesia, farmers subscribe and use the services through their Nokia mobile phones. While the Nokia Life application comes preinstalled in the handsets, the content from the service provider is delivered on a daily basis to the handsets.

The Nokia life agriculture services are available on both mid and low end Nokia phones. The native Nokia Life application provides rich user interface and displays content in 18 local languages with icons for weather and tables for market prices. The services are available only through Nokia phones at present.

Nokia does not have operations that generate technical content for the agricultural domain, so it works with knowledge partners to put content into the SMS mechanism. It works with research organizations that contribute to the editorial desk, through agricultural and health experts.

Nokia Life's long-term plan is to remain as a (commercial) service-provider, as this is the only way it can scale up its service to help more people.

Public sector policies to influence and guide the dissemination of information services related to agriculture – with the involvement of the telecommunications sector – are essential to sustain MAIS initiatives.

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6.3 Public–private initiatives in MAIS – Lessons learned in Asia

The workshop participants agreed that a working partnership with the private sector is an essential aspect for enhanced agricultural information services provided through mobile technology. As previously emphasized, the private sector has the ability to strengthen the outreach networks with more diverse partnerships.

The participants also acknowledged the need to create location-specific content that is more tailored and appropriate to the needs of farmers. The country reports and experiences presented point to a need to strengthen the role of intermediaries, both in the private sector and in civil society, as community knowledge workers who deal directly with farmers.

LIRNEasia's research illustrates the use of SMS in assisting farmers to search for market and trading partners and to provide market prices thereby improving their ability to scout for better prices and markets. An example of this is the Dialog Tradenet initiative in Sri Lanka that has been providing farmers with market price information via SMS since 2009.

One of the barriers to implementing an MAIS is the disconnect between the format in which the knowledge is available and the form that farmers can easily access and use. It is clear from the LIRNEasia research that voice-based channels remain farmers' preferred mode of receiving information because it allows them to establish a two-way dialogue to address their more specific issues. However, the delivery of truly interactive voice-based services imposes an unacceptably high cost on providers, which explains why most of the content currently available to farmers is delivered through an SMS system.

As participants in the e-Agriculture forum mentioned previously pointed out, there is a need for a clear separation between the role of a MNO and that of an agricultural information provider. Each potential partner views scaling up an MAIS differently, with the MNO wanting to scale up quickly and the agricultural partner likely not able to move at the same speed.

Hence, the roles and responsibilities in a public–private partnership have to be clearly defined in ways that accommodate all parties' different expectations.

The workshop discussion also reflected on the various forms of public–private partnerships. In many partnerships models cited during the presentations, a government agency supplies content and private operators (sometimes

state owned), usually a telecom operator, provide the delivery channel and infrastructure. However, there are viable variations on this model. The private sector's ability to strengthen such a network for a more diversified information delivery model is very important. In Thailand, for example, some private sector actors, such as foundations, have absorbed some of the costs of an MAIS or a bank has used its branch infrastructure as a communication channel.

Country presentations touted examples of emerging public–private partnerships in delivering an MAIS.

- **China:** The Ministry of Agriculture and Chinese telecom operators provide integrated services, link purchasers and supplies and deliver advisory messages. The Rural and Economic Information Center in Jilin Province also delivers an MAIS.

- **India:** The Ministry of Agriculture is working with IFFCO to serve the farming community through the IKSL initiative.

- **Philippines:** Price information systems are being tested in a partnership programme in which market reporters working with the Department of Agriculture feed in information on prices and stock volume. The Government and to Nokia Data Gathering operate a mobile data gathering system.

- **Sri Lanka:** Market price information is collected, managed and disseminated through a partnership with Mobitel Ltd; as cited previously, under the Dialog Tradenet initiative, Govi Gnana Seva[30] and Dialog Axiata PLC (the MNO) deliver spot market rates for 178 vegetables and fruits in English, Sinhalese and Tamil.

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30. Although Govi Gnana Seva is a private not-for-profit company, the Government has supported it from its inception and continues to fund part of its operational expenses.

7 SUMMARY

Digital ICTs hold great promise in bridging the gap between farmers and experts in agricultural innovation systems. The dearth of traditional extension workers and the diverse challenges of agricultural production force governments in many countries to look favourably at communication channels, such as mobile telephone technology, to provide advisory services to farm communities and other actors involved in agriculture.

The concept of utilizing mobile phones to bridge information and knowledge gaps among farmers and rural service providers is based on two assumptions. The first is the near ubiquity of access and use of mobile phones. The second is that farmers (especially in developing economies) have specific information and knowledge needs that are currently only met partially, if at all. LIRNEasia's research (among others) provides nuanced analysis of both these basic assumptions.

Socially, MAIS have yet to establish strong accountability and trust among users. Although the need to increase the awareness of MAIS among farmers and rural communities remains, the interest shown by the private sector in many countries in participating in MAIS-related activities reflect a positive trend towards adoption of MAIS. This is evident in the discussions on the e-Agriculture platform[31] and also the encouraging data on the adoption of mobile phones from the Teleuse@BOP studies by LIRNEasia. In the most recent study, voice-based interactions in MAIS scored better than SMS in terms of trust and action taken.

With regard to technology, the e-Agriculture Policy brief on Mobiles in Rural Area[32] published in 2009 identified several factors that limit the delivery of MAIS, such as the relatively high cost of handsets, limited network coverage and quality, rural people's skills in using mobile devices and the basic handset/software available. Three years later, the advent of more affordable handsets, the increase in the second-hand handset market and investment in infrastructure and "last-mile connectivity" in most industrialized countries have significantly

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[31]. See http:// www.e-agriculture.org/forums/forum-archive/forum-mobile-information-services-november-2011
[32]. See http://www.e-agriculture.org/sites/default/files/uploads/media/mobile_en_2ed.pdf

improved the technology delivery channels for MAIS.

The 2011 e-Agriculture forum on mobile information services (section 3) stimulated discussion on the differing types of partnerships and the involvement of various actors (mobile network operators, the private sector, the public sector and NGOs) in delivering useful MAIS. Unfortunately, relatively few examples of strong public–private partnerships in MAIS have been found in the region. The infrastructure and the market reach of the private sector, especially the mobile network operators, and the knowledge-base and expert systems managed by agriculture ministries would form an effective combination in delivering MAIS. Partnership with the private sector also is as an essential mechanism for enhancing the delivery of agricultural information. Public–private partnerships in MAIS are generally found at the community level where the strengths of the public and private sectors complement each other in providing information and advisory services that address the needs of farmers and rural communities. The public sector's mandate for providing information and services can be best achieved by harnessing the potential of the private sector to add local context in a commercial environment. Discussions from the workshop as well as the country reports and experiences point to the need to strengthen the role of intermediaries, such as the community knowledge workers who deal directly with farmers.

Public sector policies related to MAIS are not in place in most countries in the region. Thus, one of the policy recommendations calls for the establishment of policies across the sectors. Also, because in almost all countries policies pertaining to mobile technology and communication are the domain of the communications ministry, integrated efforts by the ministry involved in mobile technology-based policies and the agricultural ministries are strongly recommended to establish appropriate policy guidance for MAIS. Along with this, a policy on private–public partnerships for a MAIS programme, to be drafted together with incentives for experts providing advice, should be considered.

Governments can create a public knowledge/information bank (repository) that can be used and accessed by both the public and private sectors to build up an MAIS. Efficient and effective sharing of data/information by government departments is considered a major hindrance to delivering quality MAIS. Finally, it is important that guidelines and monitoring be established to evaluate the appropriateness of various MAIS and also to monitor accessibility and applicability of the advisories disseminated through the MAIS.

8 INSIGHTS AND RECOMMENDATIONS

- **Mobile-based information delivery** holds great promise and is either being considered or is in use as a major channel for agricultural advisory services.

  MAIS have even further potential to supplement traditional public sector extension and advisory systems through the creative use of emerging ICT. Mobile technology can substantially reduce costs of access as well as enable fast real-time delivery of information to large dispersed audiences. The phenomenal increase in the number of mobile phones in Asia (according to LIRNEasia research) is indicative of the accessibility of this device, even to people living below the poverty line, which includes resource-poor farmers in many countries.

- **Clear policies** need to be formulated by governments and the public sector that define the principles for their involvement in the development of MAIS, that also take account national communication policy or ICT policy. Of necessity, this will require collaboration between the agricultural and telecommunications sectors of government.

  The establishment of a national enabling environment for MAIS by the relevant agriculture-related sectors is one of the key policy actions needed to promote MAIS adoption. Specifically, the policies should address issues related to i) quality and validation of agricultural content from the public sector, ii) accessibility and availability of all government data/information by the private sector and iii) accessibility, including the cost, of MAIS, especially to smallholders.

- **Partnership with the private sector** has proven to be an essential mechanism for the public sector to develop MAIS sustainably. The roles and responsibilities for the private and public sectors have to be clearly defined in each particular case, preferably through a formal written agreement; the most frequent split of roles is that the content is provided by one and the delivery mechanism is handled by the other.

- **Trustworthiness and reliability** of the public sector information and advice delivered through MAIS is of paramount importance to the people whose livelihoods depend on actions influenced by what they receive. In this context, clear policy guidelines should be formulated to ensure the validity and accuracy of the technical information and advice provided. Appropriate processes need to be put in place to ensure the reliability of the information and advice provided by the public sector through MAIS, potentially including quality control by government-approved experts.

- **Accountability** for the quality (correctness and accuracy) of technical information and advice delivered through MAIS should be formally recognized by the respective public and private sector actors involved. This accountability should be defined in any partnership agreement between the actors in MAIS.

- **Lessons learned and good practices** have to be regularly captured and disseminated across Asia through various mediums, such as brochures, television and radio, so that provinces/countries can benefit from the experience of others.

BOX 3

Examples of effective partnerships in Asia for the delivery of MAIS

- IFFCO Kisan Sanchar Limited, which is a mobile telephone information service to empower people in rural India delivered by the Indian Farmers Fertiliser Cooperative Limited, Bharti Airtel, a mobile network operator and Star Global Resources Ltd, a non-banking finance company.

- Tradenet spot price information system delivered to farmers in Sri Lanka by Dialog Axiata PLC, the country's largest mobile network operator, and Govi Gnana Seva, or Farmer Knowledge Service, NGO

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- Ideally, agricultural information services should be **platform-independent**, given that technology-specific services impose requirements on potential audiences and can greatly limit accessibility. All newer models of mobile phones support short message, or SMS-based, services in non-Latin character sets, which is very important in countries in Asia.

- Given the region's **illiteracy** rate, voice-based advisory services are more widely preferred by smallholders than SMS-based services, even if they are automated. However, some services, such as weather forecasts, can be effective when delivered through SMS.

ANNEX I

FAO publications and activities highlighting mobile technology

1) The FAO's Avian Influenza information system used in Bangladesh extensively uses mobile technology to track the outbreak of the deadly avian (H5N1) virus in a resource deficient country. Short message services (SMS) were used to collect and manage information from a large number of grassroots-level volunteers, thereby enabling a coordinated and real-time response to contain the outbreak. This showed how mobile technology could be used for active surveillance systems. More information is available at http://www.youtube.com/watch?v=eEj0gVV44V0

2) Making e-Agriculture work through public-private partnership in Asia (2nd Edition). This policy brief is based on the e-Agriculture discussion hosted by Katalyst Bangladesh. That discussion emphasized that the public sector's mandate for the provision of information and services can be best achieved by harnessing the potential of the private sector to add local context in a commercial environment. Understanding why a public–private partnership is required, the respective mandates and incentives of the partners and their roles in the partnership are fundamental to its success. The policy brief can be found at http://www.e-agriculture.org/content/policy-brief-making-e-agriculture-work-through-public-private-partnership-asia-2nd-edition

3) e-Agriculture's online forum on Mobiles in Rural Areas, available at http://www.e-agriculture.org/mobile-telephony-rural-areas

4) Mobile telephony in rural areas (2nd Edition). Available (PDF) in English at http://www.e-agriculture.org/sites/default/files/uploads/media/mobile_en_2ed.pdf

5) Mobile technologies enriching farmers' experiences, paper presented during the 2012 Mobile Technologies for Food Security, Agriculture and Rural Development workshop by A. K. Singh. Available at http://www.e-agriculture.org/content/mobile-technologies-enriching-knowledge-and-empowering-farmers-experiences-indian-council-ag

ANNEX II

List of URLs

- United Nations, 17 May 2010, Secretary-General message on World Telecommunication and Information Society Day, New York: http://www.un.org/sg/statements/?nid=4544

- e-Agriculture COP : www.e-agriculture.org

- Mobile Information Services, e-Agriculture online forum: http://www.e-agriculture.org/forums/forum-archive/forum-mobile-information-services-november-2011

- Mobile Telephony in rural area, e-Agriculture online forum: http://www.e-agriculture.org/mobile-telephony-rural-areas.

- The mFarmer Initiative: http://www.gsma.com/mobilefordevelopment/programmes/magri/mfarmer-initiative/

- GSMA's Mobile for Development - mAgri Programme Case Study – IKSL, India: http://www.gsma.com/mobilefordevelopment/magri-programme-case-study-iksl-india/

- More in-depth findings and analysis of the Teleuse@BOP4 survey: http://lirneasia.net/projects/icts-the-bottom-of-the-pyramid/

- The complete report of the LIRNEasia study and the findings from the non-representative smallholder and agricultural microenterprise surveys: http://lirneasia.net/wp-content/uploads/2012/04/ME-Report-final.pdf

- Agricultural Market information in Cambodia: http://www.agriculturalmarketinformation.org.kh/en/agricultural-market-information/am-information

- Agricultural Information Marketing Network (AGMARKNET), India: http://agmarknet.nic.in

- Kissan Kerala initiative: http://www.kissankerala.net/home.jsp

- The Indian Council of Agricultural Research: http://www.icar.org/

- Nokia Life tools: http://www.nokia.com/in-en/life/

- Reuters Market Light: http://www.reutersmarketlight.com/index.html

- IFFCO Kisan Sanchar Limited: http:// www.iksl.in/

- The e-Choupal initiative: http://www.echoupal.com/

- The agriculture and fisheries market information system, Philippines: http://afmis.da.gov.ph/

- The Hector Kobbekaduwa Agrarian Research and Training Institute, Sri Lanka: http://www.harti.gov.lk/

- The Ministry of Agriculture and Agro-Based Industry, Malaysia: http://www.moa.gov.my/web/guest/home

- The Ministry of Agriculture's Farmers Mailbox, PR China: http://www.zjnm.cn

- Indian Institute of Technology, Bombay, India: www.iitb.ac.in

- Voice Krishi Vigyan Kendras, India: http:// www.agropedia.net/

- RBAP-MABS programme, Philippines: http://www.rbapmabs.org/home/

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ANNEX III

Workshop agenda

Day 1: 3 April 2012

Registration	
Registration	**08.00–08.30**
Welcome	
Welcome speeches Hiroyuki Konuma, ADG & RR, FAO RAP Asanee Kawtrakul, Deputy Executive Director, NECTEC	**08.30 – 09.30**
Session 1: Status of mobile use and rural information systems in agriculture and rural development in Asia	
Introduction Speaker: Stephen Rudgard, Chief OEKC, FAO	**09.30–09.45**
How the poor use ICTs: Findings from a multi-country study of teleuse at the bottom of the pyramid Speaker: Rohan Samarajiva, LIRNEasia http://lirneasia.net/projects/icts-the-bottom-of-the-pyramid/tbop4-presentation-23-nov-2011/ Video: Sayar Singh, wheat and flower farmer from Rajastan, http://lirneasia.net/projects/2008-2010/bop-teleuse-3/teleuse3videos/	**10.00–10.30**
Tea/coffee break	**10.30–10.45**
Knowledge and information needs of small growers and non-growers Speaker: Nilusha Kapugama LIRNEasia http://lirneasia.net/projects/icts-the-bottom-of-the-pyramid/tbop4-presentation-23-nov-2011/ Video: Munna Singh, collector from Bihar, India	**10.45–11.15**
FAO – Avian influenza information systems Speaker: Mat Yamage, Senior Technical Coordinator, TCES, FAO	**11.15–11.45**

NECTEC– Information technology outlook 2020 for agriculture and rural development Speaker: Asanee Kawtrakul, Deputy Executive Director, NECTEC, Thailand	**11.45–12.15**
Q&A	**12.15–12.30**
Lunch	**12.30–13.30**
Session 2: Creating an enabling environment for the use of mobile technologies for information dissemination	
Brief introduction to the afternoon's activities – Stephen Rudgard	**13.30–13.45**
Country presentation in groups (facilitator documents for presentation in plenary later in the day) (4 groups x 7 members each)	**13.45–15.00**
Tea	**15.00–15.15**
Country presentations synthesis – Presentation by facilitators	**15.15–16.00**
Panel discussions and wrap-up of Day 1	**16.00–17.00**
Cocktail dinner reception from 1830 hours onwards	

Day 2 : 4 April 2012

Recap of first day	**08.30–08.45**
Session 3: Public–private initiatives on the use of mobile technologies for development – Lessons learned	
Lessons from ICT interventions Speaker: Sriganesh Lokanathan, LIRNEasia	**08.45–09.15**
Summary of the e-Agriculture forum on mobile information services Speaker: Gerard Sylvester, FAO	**09.15–09.45**

1.) Reuters Market Light – Ranjet Singh 2.) Katalyst – Mohammad Shahroz Jalil 3.) Nokia Life – Bhanu Potta *Chat show with Stephen Rudgard as host.*	**09.45–10.45**
Session 4: Looking ahead	
Brainstorming on issues/opportunities in using mobile technology for information dissemination for agriculture, food security and rural development	
Introduction to working groups	**10.45–11.00**
Tea/coffee break	**11.00–11.15**
Working group Session 1 Opportunities and challenges in the use of mobile phones in information dissemination (4 groups x 7 member/group)	**11.15–12.15**
Lunch	**12.15–13.15**
Working group Session 2 How can an enabling environment be created with policies and practices for mobile information services (4 groups x 7 member/group)	**13.15–14.15**
Session 5: Wrap-up	
Katalyst on the role of PPP in mobile space for agricultural information services	**14.15–14.45**
Informal education to facilitate farmer practices and adoption – Suchin Petcharugsa, Ministry of Education, Thailand	**14.45–15.15**
Tea/coffee break	**15.15–15.30**
Working groups presentation (4 presenters x 10 minutes each + Q &A)	**15.30–16.15**
Plenary discussion on conclusions and follow-up to consultation	**16.15 – 17.00**

ANNEX IV

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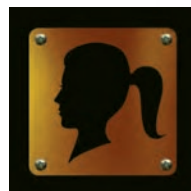Office of the Secretary
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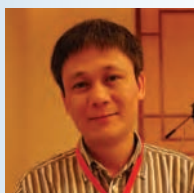Ms Gulya Chatbusayamas
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