

Mobile Telephony as an Enabler of Environmental Action in the Philippines

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Introduction

Located in Southeast Asia, the Philippines is a 7,107-island archipelago, of which only 1,000 are inhabited.¹ With natural resources from mangroves to sea grass, and various types of flora and fauna prevalent throughout the islands, the Philippines forms a topography of high mountains, volcanoes, valleys and plateaus. Of this land, 53 per cent is forested and consists of woodlands.² With 20 active volcanoes, the country experiences a number of earthquakes and eruptions. The lowlands are inhabited by the bulk of the country's 82.8 million people, which lives on just 11 of the islands.³ Life in the cities has deteriorated due to a lack of urban planning and increased population. As a result, air, water and soil pollution levels have also increased. With predicted high birth rates for the next three decades, the country is expected to undergo increased losses of forest cover, soil fertility and fish catches, resources which are already under strain. Economic growth has resulted in further environmental costs. The country is burdened with a large national debt, prevalent poverty and a high unemployment rate. The economy, once the region's best-performing, is now "aided in part by its high level of annual remittances from overseas workers."⁴ The GDP has experienced steady growth "to about 5% between 2002 and 2005 reflecting the continued resilience of the service sector, and improved exports and agricultural output."⁵ The government's fiscal capacity is further boosted from the Value Added Tax (VAT) in November 2005, implemented in November 2005, however with debt payments, population growth and unequal distribution of income, the country is challenged in sustaining its path to growth. Population growth, economic development and ineffective development policies place the Philippine environment, its natural resources and biodiversity, under serious risk. Increased levels of air and water pollution in urban areas, deforestation, soil erosion, coral reef degradation as well as increasing pollution of coastal mangrove swamps important for breeding fish, are some of the threats mentioned by the Philippines Environment Monitor 2004.⁶ The situation is made worse by ineffective environmental laws and policies, rapid urbanization, expansion of resource-based markets and the growing apathy of its populace to environmental safeguarding.

Environmental degradation is a common global problem, but strategies to halt it must be contextually specific if they are to be effective. This paper explores how the telecommunications sector, and in particular mobile telephony, offers tools that may be used successfully for environmental action in the Philippines.

¹ Arnold Tarrabago. ICT Education Case Study: Bringing ICT to Farmers and Fisherfolk of Batanes, Philippines. Asian South Pacific Bureau of Adult Education (ASPBAE). 2003. http://72.14.205.104/search?q=cache:cAQWX-SE44cJ:portal.unesco.org/education/en/file_download.php/d7ed63b4b7b26e52734bbbf19aebf9a0ICT%2BPhilippines%2BCase%2BStudy.pdf+Arnold+Tarrabago&hl=en&gl=ca&ct=clnk&cd=1

² Ibid.

³ BBC News, Country profile: The Philippines. May 5, 2006. http://news.bbc.co.uk/2/hi/asia-pacific/country_profiles/1262783.stm

⁴ CIA online country profile.

⁵ Ibid.

⁶ Philippines Environment Monitor 2004: Assessing Progress. The World Bank Group December 2004.

ICTs and environmental sustainability in the Philippines

The Philippines telecommunications sector is distinctive in that its services are provided privately instead of through a state monopoly. With five different mobile phone service operators in the country, the market is one of the most competitive in the world with “11 international gateway providers and at least two operators allowed to provide fixed service in each region across the country.”⁷ The advent of the mobile phone has left a great number of its fixed phone lines unused. As a result of the aggressive liberalization of the telecommunications market in the early 1990s, mobile phone density and the Internet penetration rate are now running to 40 and five per cent, respectively. This access to information and communications technologies (ICTs) exists against a backdrop of a country with almost a third of its 83 million people living in extreme poverty and deprivation. These realities, in most respects, support the urgency to align sustainable development policies with the e-strategies of the country, especially as it endeavors to nurture a development-oriented, people-centred information society.

Opportunities for ICTs, particularly mobile telephony, to be used and deployed in advancing environmental sustainability have been showcased through initiatives such as the *Bantay Usok* project, where smoke belching vehicles could be reported via the World Wide Web, fax, phone, mobile and e-mail. The mobile reporting from this case demonstrated how mobile phones and short messaging services (SMS), better known locally as “texts,” are enabling environmental awareness and action to abate worsening air pollution. However, the *Bantay Usok* project had a limited lifespan, and its completion has not, to the knowledge of the authors, led to follow-up initiatives. This paper expresses the need for such projects to be continued in order to bring about greater public participation and awareness. Further, similar SMS-based environmental initiatives should be implemented to cover other environmental issues such as illegal logging; illegal commercial and dynamite/cyanide fishing; garbage burning; and dumping of hazardous wastes. Given the lack of environmental accountability in the country, sustaining such a project enhances legislation and enforcement of environmental laws. Similarly, mainstreaming the environmental agenda in this way may open doors to constructive dialogue in the development and implementation of the country’s national e-strategies.

Analytical framework

Our research has indicated the ubiquity of mobile phones in the Philippines as they are convenient, relatively inexpensive and easy to acquire, and can send and receive text messages.⁸ For these reasons, using the SMS technology is an ideal and accessible way for the public to take action as well as increase their awareness of environmental issues. This is, quite literally, a solution available at the public’s fingertips for opening communication among various stakeholders in developing and enforcing policies affecting the environment.

⁷ Tarrobago, 2003.

⁸ Emmanuel C. Lallana. SMS in Business and Government in the Philippines, ICT4D Monograph Series No. 1, August 2004.

Through wider public participation, ICTs can promote the enforcement of environmental legislation. They have been used and seen as a potential enabler of national development in numerous studies. However, as indicated by Sein and Harindranath in *Conceptualizing the ICT Artifact: Toward Understanding the Role of ICT in National Development*, ICTs have been mainly viewed as a “monolithic and homogeneous entity.”⁹ This view limits the understanding of ICTs as it fails to capture the intricate and versatile nature of these technologies and to realize the contextual dangers as well as opportunities ICT use can create.¹⁰ Sein and Harindranath propose an integrative framework of ICTs in development which allows a glimpse of potential impacts through proper use and views of ICTs. In differentiating three conceptualizations of ICTs namely, their use, views and impact, the framework provides a lens through which the use of SMS technology to raise environmental awareness in the Philippines can be seen.

The framework also helps examine how ICTs can influence national development. The framework consists of the following:

- a) Four ICT Views:
 - 1) ICT as a tool, or a means to achieve something,
 - 2) ICT as a computational device,
 - 3) ICT as part of a bigger “package” and
 - 4) ICT as a proxy, a representation of something
- b) Four ICT Uses:
 - 1) as a commodity
 - 2) as support for development activities
 - 3) as an economic driver
 - 4) as a customized approach to specific development activities

The above functions produce three orders of ICT impact on human development:

- 1) First order: substitution
- 2) Second order: increase in the phenomenon
- 3) Third order: emergence of new structures

The areas of impact on human development identified in the framework include:

- 1) Healthy life
- 2) Education
- 3) Standard of living
- 4) Political freedom and democracy
- 5) Human Rights
- 6) Other implicit factors: wealth, distribution and social mobility.¹¹

⁹ Sein and Harindranath, *Conceptualizing the ICT Artifact: Toward Understanding the Role of ICT in National Development*, The Information Society, 20:15-24, 2004.

¹⁰ Ibid.

¹¹ Adapted from the “Integrative framework of ICTs in development” diagram in Sein and Harindranath, 2004.

The *ensemble* ICT view described in the framework—ICTs as part of a bigger “package”—is the view adopted in this paper, since the use of SMS for environmental action fits with the country’s mobile telephony market and the local population’s affinity to communicating via “texts,” with almost 34 million owning cellular phones and communicating via SMS.¹² The ensemble view holds that the social and contextual aspects determine how ICTs are conceived and that the success or failure of developmental ICT applications in a country depends on their “fit” with the socio-economic and cultural context in which they are implemented.¹³ The *proxy view* is also relevant here as ICTs are seen as a knowledge enabler. This paper proposes the use of SMS to generate knowledge and information to users of the service. The framework’s *ICT use* view, specifically, use directed at specific development sectors or projects too applies when it comes to our proposed use of mobile telephony, since SMS technology is being used specifically to generate environmental awareness and action, in the ICT and the environment sectors. Finally, all three effects outlined in the *impact* view can be anticipated. The primary effect is seen in the options for the public to use the SMS medium to learn and act on environmental safeguarding measures and to continue relying on this means of communication instead of writing letters or filling out forms by hand. This leaves the door open for other effects to take place such as the increased acceptance of SMS for environmental activism, and the generation of further interest and action. The tertiary effect is expected in the change in society’s attitude toward the environment. This, in turn, affects human development as people become mobilized to hold government accountable through their actions and awareness.

Research methodology

Data gathering and research were carried out in three ways. First, a print and electronic literature review was conducted on sources of global and national trends in information and communications technology and its role in achieving sustainable socio-economic development. Second, a series of interviews with key ICT and sustainable development policy-makers and non-governmental organizations in the Philippines was held. Third, Robert Sagun organized two meetings, a multi-stakeholder consultation and a national conference hosted by the Environmental Education and Information Division (EEID) of the Environmental Management Bureau (EMB) of the Department of Environment and Natural Resources (DENR) and the Asian Development Bank, on May 3 and 27, 2005, respectively.

Environment: Air and Water Pollution

Since the first publication of the Philippine Environment Monitor 2000, the Philippine government has taken steps to legislate environmental laws to improve air and water quality, among other preservation efforts. These efforts have been aided by economic policies concerning the environment, and have resulted in increased dialogue on environmental topics between government, the private sector and civil society. Nevertheless, the changes measured on the ground by environmental indicators have been slow. As stated in the

¹² Lallana.

¹³ Ibid.

executive summary of the Philippine Environment Monitor 2004, “years of neglect, haphazard policy making and weak local environmental management have taken a toll in the form of widespread environmental degradation and acute pollution problems.... The costs of environmental degradation are high, where they are quantifiable.” For example, the annual economic losses caused by water pollution are estimated at PHP 67 billion (US\$1.3 billion) and the increased health costs of exposure to air pollution (particulate matter) in four urban centres alone are estimated to be over PHP 21 billion (US\$400 million).¹⁴

As Bronce and Sagun point out in their article¹⁵ “Texting Smog:”

The quality of Philippine air is generally deteriorating given the alarming figures that are released by official sources each year. For total suspended particulates (TSP) alone, annual standards are exceeded at 70 per cent (22 out of 32) of the air quality monitoring sites, with Metro Manila registering the worst readings... On the other hand, the one-hour standard for ozone is exceeded in seven out of eight months in 2001 to 2002 in Metro Manila. The only consolation is in the fact that lead concentration has manifested decreasing ambient levels due to the elimination of lead in gasoline since January 2001.¹⁶

The passage of the Clean Air Act (CAA) in 1999 was described as monumental in the country’s legislative history since it provided an encompassing air pollution control program that set limits for, among others, “ambient levels of major pollutants such as Total Suspended Particulates (TSP), particulates smaller than 10 microns (PM10), sulphur dioxide, etc.” A core strategy that the measure forwarded was the employment of market-based instruments and the enhanced role of the private sector. There were even experts who opined that the measure provided stringent standards (but which were based on World Health Organization [WHO] limits) which could not be easily met given the country’s perceived weak governmental capacity and the private sector’s purported non-cooperation. That may be, but the CAA was still a pioneering law that promoted environmental sustainability, particularly in averting further air pollution in the country. Its implementation, however, proved even harder than its adoption. There was an initial delay in its full implementation largely due to non-appropriation of government funds. Some observers have noted that even with limited budgetary support, progress had been made in a number of areas,¹⁷ although it is not certain whether they were a direct result of the CAA or of civil society initiatives that have sought to mobilize society and government seen through projects such as the *Bantay Usok* described in the opening paragraphs of this paper.

¹⁴ Philippine Environment Monitor, 2004.

¹⁵ R. Bronce and R. Sagun, *Texting Smog, What’s Next?: Sustainability in the Information Society*, TakingITGlobal (Canada) and Youth for Intergenerational Justice and Sustainability (Germany), December 2003.

¹⁶ Ibid.

¹⁷ This includes: a rise in the number of designated air sheds from six in 2003 to 14 by August 2004; a reduction of aromatics in unleaded gasoline, from 45 per cent in 2000 to 35 per cent in 2003 and the lowering of benzene content from two to four per cent; a 75 per cent reduction in the sulfur content of automotive diesel by January 2004; nationwide implementation of emissions-testing requirement prior to registration; setting-up of 12 networked electronic stations; improvement in automotive technology and intensified anti-smoke belching drives in urban areas (Philippine Environment Monitor, 2004).

Water quality is another serious issue in urban areas as availability and quality of surface and groundwater is lowered by poor sanitation and sewage systems, and increasing levels of domestic wastewater discharges causing its pollution. At 1,907 m³ per capita, water availability in the Philippines is lower than Asian and world averages. With the demand predicted to increase by roughly 300 per cent from 1995 levels in 2025, water management is a pressing problem for the country.¹⁸ As river basins experience water scarcity, leading to an uneven distribution of water throughout the country, highly populated areas are already experiencing water shortages, especially during the dry season. The three main sources of water pollution are domestic, industrial and agricultural. Of the 2.2 million metric tons of organic pollution, 48 per cent; 37 per cent; and 15 per cent are produced by these three sources respectively.¹⁹ Metro Manila is one of the four water-critical regions where pollution comes from mainly the domestic and industrial sources. Estimates of organic pollution contributed from the domestic sources do not include solid waste disposed directly into water bodies, which add to water pollution and degradation. The Environmental Management Bureau of the Department of Environment and Natural Resources hands out permits that allow industrial entities to discharge wastewater into the rivers. With “unclear and overlapping mandates” and insufficient funds, many of the agencies responsible for enforcing the Water Code of the Philippines are unable to effectively monitor the discharges into water sources.²⁰ As the Philippine Environment Monitor points out, the technical staff and resources are not equipped with adequate skills to monitor and enforce proper legislation and inspections.

The Monitor lists the costs of water pollution alone to be at PHP 67 billion (US\$1.3 billion) which consists of health costs at PHP 3 billion; fisheries production PHP 17 billion; and tourism to be at PHP 47 billion. Regarding the air, “in 2001 alone, the health costs of particulate (PM10) pollution in the four largest cities were estimated to be more than US\$400 million. A perception survey that was conducted in 2001 indicated that more than 72 per cent of Manila’s residents were distressed by air pollution and 73 per cent did not know if the government was taking any responsibility”.²¹ With these problems at hand, it is difficult to ascertain whether improvement is being made. Poor information gathering, data analysis, and a general lack of capacity to translate analytical results into policy decisions leave a wide gap for further action to take place. The challenges faced by the environment sector are therefore related to environmental management and governance, policy-making and implementation. Besides the need for a long-term commitment to efforts to preserve environmental resources, initiatives to raise public awareness, and thereby increase public and political action, are vital for preserving and instigating a national commitment to the environment. It is in the public’s interest to increase participation of the people.

¹⁸ Philippine Environmental Monitor 2004.

¹⁹ Ibid.

²⁰ Ibid.

²¹ Ibid.

ICTs in the Philippines

In 2002, the Philippines ranked 76th out of the 165 countries indexed by ICT diffusion²² in a 2004 study²³ conducted by UNCTAD. This is an outstanding improvement from its rank of 126th in 1995, but it is worthy to note that the Philippines has held its 2002 ranking since 1999, except in 2001 when it fell to 79. This strongly indicates that the Philippines' ICT infrastructure and policy environment have not significantly advanced since 1999. Such a conclusion is further supported by another cross-country ranking conducted by the META Group, a globally-known United States-based ICT consultancy firm. In its 2001 Global Technology Index, the Philippines slipped from its 1999 ranking of 32 and 38 out of 49 nations to 39 and 45 in 2001 in the categories of transformation to a digital economy and technological innovation capacity, respectively. The decline in the former category was attributed "mainly to the decline of the number of computers per capita, weak deployment of cellular access and small population of internet users."²⁴

The Philippines is one of the few countries where telecommunication services are owned by the private operators rather than the state. It has five different mobile phone operators²² and 11 international gateway providers. The country's Technology Achievement Index (TAI) ranked the Philippines as 44th in the world and the country was labelled a dynamic adopter.²⁵ Since 1971, with the establishment of the National Computer Center (NCC), the country has demonstrated its eagerness to use ICTs and its adaptability. The NCC, an agency that operated under the Office of the President until March 2000, has been transferred to the Department of Science and Technology to ensure more effective supervision and administration of ICT policy and program coordination. As a member agency of the Commission on Information and Communications Technology (CICT), the NCC coordinates all e-government initiatives and implementation of IT plans.²⁶

CICT's vision for the Philippines is to become an e-society where citizens are encouraged to use technologies that provide quality education, efficient government service, greater sources of livelihood and, ultimately, a better way of life. Under the Office of the Secretary of CICT, there are four committees, each headed by a Commissioner:

- 1) **e-Government Implementation Committee** whose vision is to provide government services to stakeholders online and to facilitate better, more efficient and more transparent government service.
- 2) **Human Resource Development Committee** whose objective is to develop an information technology-enabled workforce.

²² Different ICT indicators were used and lumped into the following dimensions: depth of connectivity, level of access and competition policy.

²³ *The Digital Divide: ICT Development Indices 2004*, UNCTAD 2005.

²⁴ Adapted from Chapter 19: Science and Technology of the Medium-Term Philippine Development Plan 2004-2010, page 231.

²⁵ Tarrobago, 2003

²⁶ The CICT was created by the current President Gloria Macapagal-Arroyo in 2004 and replaced the Information Technology and E-Commerce Council (ITECC) formed by the previous President, Fidel Ramos.

- 3) **Business Development Committee** whose objective is to develop the country as a world-class ICT services provider.
- 4) **Information Infrastructure Committee**, which is responsible for the development of the nationwide information and communications infrastructure.



Figure 2: Government strategies for building the Philippine information society.²⁷

e-Government

In the Philippines, the concept of e-government emerged with the commercialization of the Internet, telecommunication liberalization, and the explosion of cell phone and SMS use in the 1990s.²⁸ The Government Information Systems Plan (GISP)²⁹ is one of the documents guiding e-government implementation in the Philippines. Prepared through a multi-stakeholder process and consultation, it was adopted in July 2000 with the objective of making government more accessible to citizens. Although the initiative has suffered from a lack of dedicated and strategic funding,³⁰ it has contributed to the country's lead in "m-Government."³¹ M-government is the use of mobile and wireless technologies to improve government operations and empower citizens. Theoretically, the service can enable access to and availability of public information and government services. One of the main reasons for this is the widespread use of SMS in the Philippines, particularly the fact that mobile text

²⁷ Commission on Information and Communications Technologies (2005).

²⁸ Lallana.

²⁹ Formed via Executive Order 265.

³⁰ Ibid.

³¹ Ibid.

messages are either free or cheaper than a regular mobile call.³² As a key component of the government's implementation of e-governance, the National Computer Center, as mandated by Executive Order No. 269³³ to coordinate and implement all e-government IT initiatives and plans, carried out an extensive survey of National Government Agencies (NGAs) with SMS/Text-Based Services in 2004. The study found out that 50 key NGAs deliver SMS-based services³⁴ varying from queries, verification, information access, feedback and reporting complaints as of June 2005. One such agency is the Department of Environment and Natural Resources (DENR). The *DENR @your Service* SMS Facility, aside from having a feedback and reference system for DENR staff and line bureau and regional offices, takes in public inquiries and complaints on issues related to environmental management and natural resources protection sent to the number 2920.

Mobile phone usage

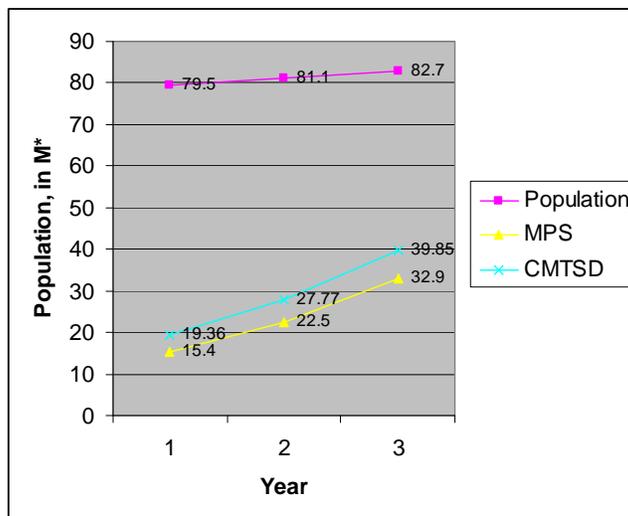
The liberalization of the telecommunication sector led to an increase of private operators from one to five in the 1990s, resulting in lower mobile tariffs. The demand for SMS is higher than the demand for fixed lines as the mobile services allow anyone to acquire a cell phone: costs of calls are lower and pre-paid plans enable more people to be able to subscribe.³⁵ Starting with a modest 1.7 million Filipinos having a mobile handset in 1998, Figure 3 below shows the impressive growth in the number mobile phone users, between 2002 and 2004. In 1994, SMS was provided by cellular service providers as a free service to encourage the public to subscribe. Fees for SMS began to be charged in 2000 when telecom operators first experienced network clogging due to large volumes of texts sent out by a growing number of post-paid and pre-paid subscribers and to the search for new sources of revenue generation to finance the establishment of more cell sites.

³² M. Minges, E. Magpantay, L. Firth, and T. Kelly. Pinoy Internet: Philippines Case Study. International Telecommunication Union, Geneva, Switzerland. March 2002.

³³ Otherwise known as "Creating the Commission on Information and Communications Technology."

³⁴ Report on National Government Agencies with Short Messaging Service (SMS) Facilities as of June 2005. Plans Review and Monitoring Office, NCC, CICT.

³⁵ In December 2000, 80 per cent of subscribers were pre-paid. (See fn. 33.)



MPS: Mobile phone subscribers
 CMTSD: Cellular mobile telephone subscriber density (expressed in percentages)

Figure 3. Cellular mobile phone subscriber density, 2002–2004.

Sources: MPS data were obtained from the National Computer Center (NCC). Population data are from the National Statistical Coordination Board. *Adapted from NCC online report.*

The SMART and smarter ways

With more ICT initiatives and projects being implemented by government and civil society organizations, innovative ways have been developed to address various development issues. In recent years, more and more government agencies are developing SMS-based services to reach out to the public. Lallana³⁶ points out in his study that there are at least three different m-Government “business models” in use in the Philippines, namely:

- 1) *“Agency managed” model.* While the SMS-based service is developed in partnership with a cellular service provider, management of the service is retained by the government institution. This type of arrangement is the cheapest for the public sending SMS to the agency, i.e., PHP 1.00 if within the same network, PHP 2.00 if through a different network.
- 2) *“Public-private cooperation” model.* Here, cellular service providers and government agencies collaborate and share resources during project development and implementation. Such arrangement costs PHP 1.00 to the sender.
- 3) *“Outsourcing” model.* Government agencies co-develop an SMS-based tool with a service provider whereby day-to-day operations and management of the service is outsourced to the latter. Though such arrangement is technically hassle-free to the agency, the service cost of PHP 2.50 per message is borne by the SMS-sending public.

³⁶ Lallana.

According to a preliminary report titled, “Mapping ICT4D projects in the Philippines,” presented by Alampay and Tiglao, there are 490 ICT projects.³⁷ These projects are categorized into e-Agriculture, e-Government, e-Environment, e-Business, e-Employment, e-Health, e-Learning and e-Science. A majority of the listed projects were government initiatives. Thirty-two environmental programs were listed in the database.³⁸ Most of the projects listed involved Geographic Information System (GIS) applications. Geographic information system applications have also been used to map out contours, hydrology, land use, soil type, erosion, land cover and population, among others. Use of ICTs for the environment also involved empowering people to report cases of environmental pollution or degradation. Notable is the *Bantay Usok* project that uses SMS to link up citizens with an environmental group and government in monitoring the environment, particularly high-emissions vehicles, common on the streets of Metro Manila.

SMART

Adapting the same models, environmental NGOs, or, more broadly, civil society organizations, have developed SMS-based initiatives either by collaborating with application service providers or by themselves, especially if they have in-house IT personnel. One application service provided collaboratively is the I-Contacts Corporation of SMART, one of the country’s leading telecommunications companies. In early 2004, SMART introduced an innovation in customer relations management (CRM) called SMS CARE. It is a holistic CRM service that receives feedback, comments, suggestions, queries and other user-specific messages straight to e-mail, Internet inbox or any specified mobile number; provides general information, advisories, announcements and the like; provides user-specific data like grades, accounts due, loan status, account details, follow-ups, etc.; conducts polls and surveys with specific voting limitations and provides real-time results; and creates customized SMS solutions. Some of the advantages of SMS CARE include, among others, quick and easy activation; having a personalized access code which protects privacy and security; no special hardware or software required; and complete user autonomy (for example, clients can activate services on their own). The service is fully managed and controlled directly by SMART through I-con. Though the service is given to clients such as NGOs and government agencies free of charge, the individual sending a text message to the NGO/government agency’s SMS-based service is charged PHP 2.50 per SMS. This cost, however, which is 150 per cent higher than that for other SMS use, can be prohibitive for the public user.

SMS CARE functions like a message forwarding and response management system can be used to receive customer feedback, queries and complaints. All received text messages are stored and may be viewed on the Internet or forwarded to a mobile number or e-mail address by the person or organization handling a personalized access code. In general, mobile phone users can send text messages using the following syntax structure:
<COMPANY KEYWORD>_<MESSAGE> SEND TO PERSONALIZED ACCESS

³⁷ The report (Alampay, E. and Noriel Tiglao. A preliminary report on Mapping ICT4D Project in the Philippines, February 2005.) was presented at the national conference hosted by the Environmental Education and Information Division (EEID) of the Environmental Management (EMB) of the Department of Environment and Natural Resources (DENR) and the Asian Development Bank in May 2005.

³⁸ Ibid.

NUMBER.

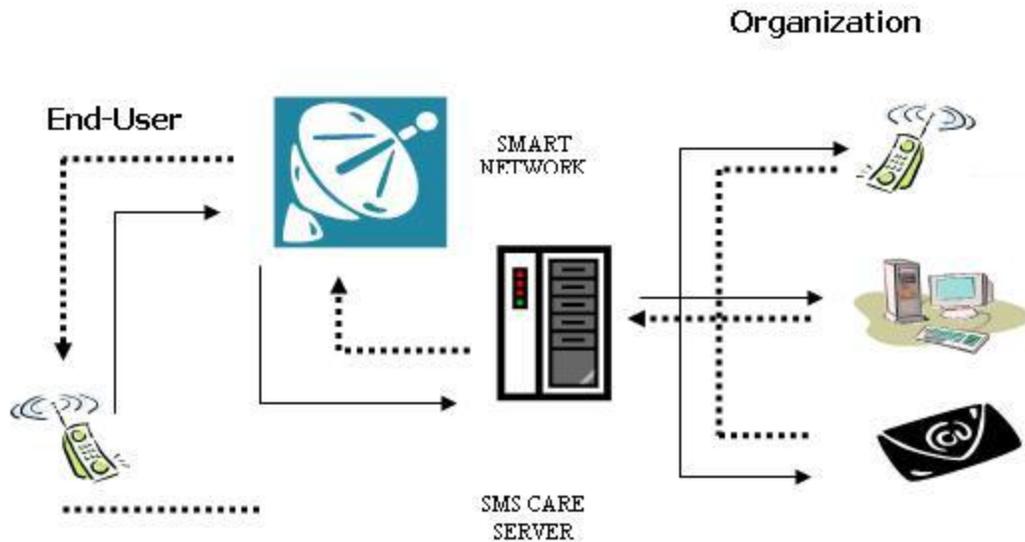


Figure 4: SMS CARE process flow³⁹

SOS SMS

An initiative where service providers has been by-passed, thus becoming cheaper to the “texting” public, can be seen in the recent SOS SMS initiative for Overseas Filipino Workers (OFW) in Distress (SOS SMS). Launched by the Center for Migrant Advocacy (CMA), the SOS SMS is a 24/7 text-based ICT mechanism conceptualized and developed by OFWs and implemented in partnerships with NGOs and concerned citizens worldwide, especially in Middle East countries where many of the OFWs are located. Although recent, this initiative has proved to be rather successful due to the OFWs’ familiarity with mobile use, the system’s 24/7 reporting availability and, more significantly, the responsive nature of the system. The portal and central database are housed and managed in a computer worklab maintained by the Institute for Popular Democracy.⁴⁰ As Soriano mentions, this system is a software-based reporting system where a central computer receives the messages and directly forwards it to CMA staff and to Department of Foreign Affairs (DFA) officials, thereby allowing immediate responses depending on the nature of distress call or SMS.⁴¹

Ellene Sana, the Executive Director of the Center for Migrant Advocacy, says the project’s creation and development was initiated by OFWs and is maintained by them. Sana explains that, as a text-based mechanism, SOS SMS rides on the backbone of the cell phone technology, capitalizing on the OFWs’ familiarity with the SMS utility... The SOS SMS system establishes an electronic trail by logging and storing automatically all critical message details that will be useful in developing research leads, remedial recommendations and

³⁹ SMART Care (2005).

⁴⁰ Center for Migrant Advocacy. SOS SMS for Overseas Filipino Workers in Distress. May 20, 2006. <<http://www.pinoy-abroad.net/lungga/index.shtml?apc=n--5311->>

⁴¹ Interview with Roberto Soriano, Institute for Popular Democracy.

advocacy thrusts.⁴²

The steps to this process are detailed below:

Step 1. Call/ TEXT for help – For immediate relief/action on request for assistance
Text SOS <space> <sender's name and message> and send to +63 9209 OFW SOS (+63 9209 639 767)

Step 2. Receipt and recording – Text Message is received by the SOS SMS System where it is logged and stored in the database (Information recorded includes the sender's mobile number used; date and time received; Message; Sender's name and/or address)

Step 3. Forwarding/referral – Text Message is auto-forwarded by the computer to the designated recipient cell phones. SOS SMS System logs recipient's number, forwarding date, whether it was acknowledged or replied to, when and from what number.

Step 4. Verification and action – SOS SMS receipt of and transmission of the message is verified and the appropriate action is determined.

Step 5. Case-file development, follow-up and resolution – CMA periodically prints out the master computer log and initiates a case file with a written report on each individual case received by the SOS SMS system and forwarded to the DFA. These constitute the initial case-file document, the hard-copy basis for periodic follow-up until the reported cases are resolved.

Step 6. Data mining and research – CMA documents, indexes, classifies and analyzes all reported cases of distressed OFWs according to work category and geographical location, gender, type/form of abuse, destination/work place, type/form of intervention extended, case response and resolution times, groups (GOs, NGOs and individuals, here and abroad) involved or mobilized.

Step 7. Advocacy – CMA and its partners develop advocacy thrusts aimed at identifying loopholes in respect of migration attitudes, policies and practices, as well as make recommendations to address them, either through executive, administrative or legislative action.⁴³

SMS-based environmental initiative: Bantay Usok

The encouragement of non-government participation in air pollution control initiatives is tremendously important for achieving improvements in air quality. One initiative that has enjoyed public support is the *Bantay Usok*⁴⁴ project of the ABS-CBN Foundation, in partnership with the Land Transportation Office (LTO), the national agency responsible for vehicle registrations. Using ICTs to promote its goals of helping to lessen air pollution while encouraging public participation, the project targeted owners of smoke belching vehicles in Metro Manila (70 per cent of pollution in the area is attributable to vehicle emissions). The *Bantay Usok* project's anti-smoke belching apprehension team has been tasked with implementing roadside testing and apprehension by the LTO.

The program worked efficiently by applying multiple approaches, such as information and education campaigns and the popular roadside apprehension squad which stopped smoke-belching vehicles on Metro Manila's roads. It has employed both the traditional ICT modalities such as e-mail, online reporting via the Web site (<http://www.bantayusok.com>),

⁴² Interview with Ellene Sana, Executive Director of the Center for Migrant Advocacy.

⁴³ Center for Migrant Advocacy. SOS SMS for Overseas Filipino Workers in Distress. May 20, 2006. <http://www.pinoy-abroad.net/lungga/index.shtml?apc=n--5311->

⁴⁴ In English, Bantay Usok means "guarding for smoke."

phone and fax, and innovative ones such as the use of SMS on mobile phones, all as reporting-of-violators mechanisms (as well as snail mail). Of course, it helped that the project is the brainchild of the non-government arm of the country's media giant—the project received ample free television airtime.

It is the use of SMS, however, that stands out. Anchoring on the popularity of mobile applications in the country, *Bantay Usok* received numerous awards and was cited by various bodies. By May 2005, the total number of texted reports already reached almost 240,000 since the project's start-up date of June 2002. This translates to about 6,900 SMS messages per month or 81 per cent of the total reported complaints over the same period where online and phone-in reports only accounted for 18.5 per cent and 0.05 per cent of the total, respectively. Its success can be attributed to its strong message: that a vital solution to air pollution woes is right at the citizen's fingertips. While the other modalities have also been effective, it was the relative ease in texting that made this one different. The public can simply text <USOK> space <PLATE NUMBER> space <LOCATION SIGHTED> space <VEHICLE TYPE> and send it to 2366.

Without a doubt, the project's success depended on the regular use of SMS in the country, their hassle-free nature and ubiquitous presence. Further, regular apprehensions on the roads, and reports about them aired on national TV, sent a strong message to the public that their participation resulted in concrete actions. However, the project likewise faced challenges that caused it to cease operations in May 2005. One of the reasons was the competition for funds within the Foundation's numerous environmental programs. Another reason, which by far had the most impact, was the lack of strong cooperation and diligence of the Land Transportation Office (LTO) in summoning vehicle owners with reported smoke-belching vehicles. Although the volunteer squad of the project was mandated to apprehend vehicles, it is the LTO who had to summon their owners and test their vehicles. Of the 8,000 vehicles summoned by LTO based on valid reports submitted by *Bantay Usok*, only two per cent of were actually tested for emissions, and 86 per cent of the summons were returned to LTO due to incomplete or wrong addresses.⁴⁵

Overcoming Gaps: Developing Environmental Partnerships

Lessons provided by both SOS SMS and *Bantay Usok* should serve as a basis for new similar projects employing mobile telephony for environmental action. Such projects should incorporate *Bantay Usok's* main objective of advancing environmental action, and involve concerned citizens to report on environmental threats like smoke-emitting vehicles, mismanagement of water resources, illegal logging, and industrial water and air pollution. The SOS SMS system provides a blueprint for establishing an inexpensive system available 24/7 where callers could text a given number along with, for instance, AIR/H2O <space> vehicle number/person or industry name and send to the system number given for this particular initiative. Given that funding is one of the main reasons for the cessation of *Bantay Usok*, collaborating with CICT and DENR could potentially appropriate the necessary funds

⁴⁵ Lallana.

for such an initiative. A civil society organization may be able to house the SMS system. In that case, it would be up to the LTO, in the case of reported smoke-emitters, to follow up on summoning vehicles that are the main air pollutants and the appropriate agency for industries that pollute. With clearer definitions of roles and responsibilities, a more enhanced system could propagate public participation and participation from other relevant agencies and NGOs.

The interviews conducted during the research with ICT Commissioners, NGO representatives as well as representatives from the Philippine Council for Sustainable Development (PCSD) and the Department of Natural Resources (DENR), indicate a persisting gap between the parties, one derived mainly from pre-conceived notions. For instance, NGOs cite skepticism when dealing with government officials over projects that involve both parties. There is an apparent lack of trust between both parties: one of the NGO interviewees points out, “relationships with government can be challenging and problematic.”⁴⁶ With high turnover rates for government officials, it makes it even more difficult to maintain relations and government interest. Each party is said to have a different set of approaches, “not wrong approaches but just different,” which leads to differences in understanding how a project should be implemented.⁴⁷ (For example, the top-down approach prevalent in most government offices can be contrasted with a bottom-up approach advocated by grassroots NGOs.) Additionally, CICT was unaware of the existence of PCSD, and both DENR and CICT have never sought collaboration or made any contact with each other. Interestingly, all seem open to working together but lack the initiative to lead any projects due to inadequate funding and resources. In the case of CICT, they have to work according to their mandate and responsibilities. This situation clearly demonstrates the perennial difficulty in bridging government groups with each other and with civil society organizations in the Philippines.

With weak environmental mechanisms to ensure clean air and water, as well as the perceived low priority of environmental issues among government officials, except those directly mandated to attend to such issues, it becomes imperative for civil society organizations and the Filipino people to take action through initiatives like *Bantay Usok* and by combining knowledge and experience from implementing other SMS-based initiatives like SOS SMS. Even with numbers indicating the costs of air and water pollution to be in the billions, action from the government has been limited and not sustained. Agencies such as the DENR have their hands tied with restricted funds and inadequate human resources. Nevertheless, it is vital, not to mention strategic, that DENR dialogue with CICT and both agencies should collaborate with each other. CICT has the resources in ICTs while DENR can build up the funds and allocate them accordingly. Including and engaging civil society organizations would help the process as these organizations have resources of their own such as the SMS system proposed by Roberto Soriano of the Institute for Popular Democracy (IPD). Combining resources, efforts, funds and knowledge in such an initiative could enable innovative teams to gather and share their knowledge and advance the area of practice.⁴⁸

⁴⁶ Interview with an NGO representative in the Philippines.

⁴⁷ Ibid.

⁴⁸ Willard and Andjelkovic, *A Developing Connection*, International Institute for Sustainable Development, Winnipeg Canada.

Policy Recommendations

As observed from the existing reality of relations between the DENR, CICT and PCSD as well as NGOs, there exists a strong need for collaboration on an SMS initiative to curb air and water pollution in the Philippines. This paper calls for recognizing the potential of mobile telephony as an enabler of environmental sustainability in national SD policies and e-strategies, and for opening up the possibility of the wider provision of funding for such initiatives. For instance, an ICT4D Inter-Agency Committee or Task Force lead by PCSD, DENR, CICT and Department of Science and Technology (DOST) can be set up, with its work contributed to by NGOs experienced in the initiatives discussed above. Such a group would promote local m-vironmental governance and capacity-building and allow for the replication of similar SMS-based environmental projects. Another possibility for achieving a similar outcome is to open the membership in PCSD to include media and telecom operators and ICT4D-oriented civil society organizations. Regardless of which avenue is taken, CICT should reach out to environmental groups and encourage them to partake in future e-strategy dialogues.

As a strategy to secure broader public support for such SMS-based environmental initiatives, the government and NGOs must encourage the media, both broadcast and print, to profile, support and promote ICT4D projects. In the case of *Bantay Usok*, citizens were made aware of the severity of air pollution in Metro Manila and what they can do to avert the situation through regular airing on national TV and distribution of brochures and stickers about the project. Achieving a high level of public awareness of the issue through continuous multi-media information campaign would prove beneficial to attaining a successful SMS-based environmental project. Accordingly, the government must encourage mobile phone makers and distributors and telecom operators to support mobile telephony-enabled environmental projects, for instance, by sending environmental information or trivia to their subscribers who have agreed to receive them. As suggested by one of the NGO interviewees, we must find “champions” within telecom operators who will help advance and support SMS-based environmental initiatives. Lastly, the government can potentially secure revenues to finance innovative ICT4D projects by imposing an SMS tax to be borne by mobile phone companies. In November 2004, a similar House Bill⁴⁹ was debated but did not pass Congressional hearings. Implementing such a law, though politically controversial, can positively contribute to the socio-economic development of the country.

The proposed SMS initiatives would provide valuable data for further policy development: logged calls and texts could, for instance, be used to document cases of pollution, and to target and promote necessary policies for its prevention. This data could potentially also be shared with environmental NGOs, researchers and policy-makers to widen the knowledge base and advance similar work.

⁴⁹ House Bill No. 3977: An Act Imposing a Fifty-Centavo Specific Tax on (Excluding Value-Added Tax) SMS using the Cellular Network to be borne by Cellular Phone Companies, Creating a Special Infrastructure Fund for Public Works Projects, and for other Purposes. First Regular Session of the 13th Congress, House of Representatives. December 2004.

Bibliography

- Alampay, E. and Noriel Tiglao. A preliminary report on Mapping ICT4D Projects in the Philippines. February 2005. Presented at the national conference hosted by the Environmental Education and Information Division (EEID) of the Environmental Management (EMB) of the Department of Environment and Natural Resources (DENR) and the Asian Development Bank on May 3 and 27, 2005
- Bronce, Roentgen and Robert Sagun. Texting Smog, What's Next?: Sustainability in the Information Society, TakingITGlobal (Canada) and Youth for Intergenerational Justice and Sustainability (Germany), December 2003.
- Chapter 19: Science and Technology of the Medium-Term Philippine Development Plan 2004-2010
<http://pcsd.neda.gov.ph/>
- Country profile: The Philippines. BBC News. May 5, 2006.
http://news.bbc.co.uk/2/hi/asia-pacific/country_profiles/1262783.stm
- Centre for Migrant Advocacy. SOS SMS for Overseas Filipino Workers in Distress. May 20, 2006.
<http://www.pinoy-abroad.net/lungga/index.shtml?apc=n--5311>
- Lallana, Emmanuel C. SMS in Business and Government in the Philippines. ICT4D Monograph Series No. 1. August 2004.
- Minges, M. *et al.* Pinoy Internet: Philippines Case Study. International Telecommunication Union. Geneva: ITU, 2002.
- Philippines Environment Monitor 2002: Air Quality. The World Bank Group, November 2002.
- Philippines Environment Monitor 2003: Water Quality. The World Bank Group, December 2003.
- Philippines Environment Monitor 2004: Assessing Progress. The World Bank Group, December 2004.
- Sein, Maung K. and G. Harindranath. Conceptualizing the ICT Artifact: Toward Understanding the Role of ICT in National Development. The Information Society, 20:15-24, 2004.

Tarrobago, Arnold. ICT Education Case Study: Bringing ICT to Farmers and Fisherfolk of Batanes, Philippines. Asian South Pacific Bureau of Adult Education (ASPBAE). 2003.
http://portal.unesco.org/education/en/file_download.php/d7ed63b4b7b26e52734bbbf19aebf9a0ICT+Philippines+Case+Study.pdf

The Digital Divide: ICT Development Indices 2004, UNCTAD, 2005.

The World Factbook 2006.
<https://www.cia.gov/cia/publications/factbook/index.html>

Willard, Terri and Maja Andjelkovic (eds.). A Developing Connection: Bridging the Policy Gap between the Information Society and Sustainable Development. International Institute for Sustainable Development. Winnipeg: IISD, 2005.
http://www.iisd.org/pdf/2005/networks_dev_connection.pdf