ICT Update
a current awareness bulletin for ACP agriculture

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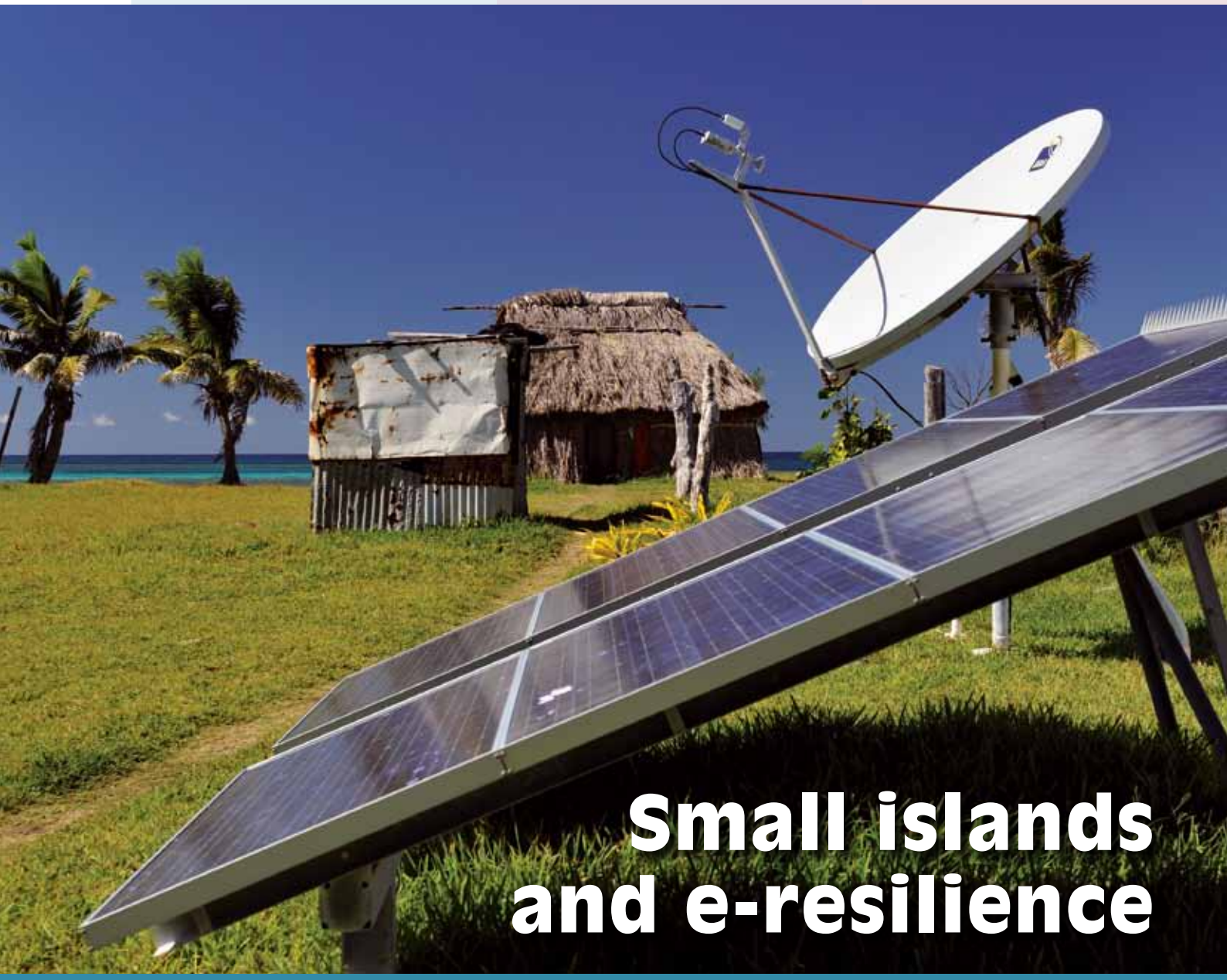
April 2013

http://ictupdate.cta.int

ICTs are helping small islands overcome geographical isolation

A programme in the Caribbean is boosting the mobile innovation sector

ICTs are improving natural disaster management in the Pacific



Small islands and e-resilience

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Small islands and e-resilience

ICT Update

ICT Update issue 71, April 2013.

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Mixed Sources

Guest editor

The rise of ICTs in the Pacific

A Pacific-wide online discussion looked at the use of mobile phones and how fast-improving internet access will bring about change in the region.

When international travellers destined for Suva, the capital of Fiji, arrive at Nadi Airport, they may be surprised to learn that they still have a three-hour road journey ahead of them. Yet they would be in for an even greater surprise if they planned to travel to another Fijian island or to another of the 15 countries in the Pacific Ocean, which takes up more than one-third of the planet's surface. Travel between or even within Pacific islands is usually by local boat, ferry or small plane. Ferries typically take two days to travel between islands just within one Pacific country and longer in bad weather.

Respondents discussed many types of ICTs, with mobile phone opportunities emerging as the most preferred option

This anecdote provides a useful perspective from which to better understand the opportunities and challenges of ICTs and social media in the Pacific. The opportunities normally provided by modern technology are constrained by an outdated internal infrastructure in dire need of investment and islands scattered across a vast expanse. This seems to hold true for ICTs and for travellers in the Pacific Ocean.

Operationalising programmes

Mobile phone ICT technology is used primarily as a tool to operationalise programmes. Examples include mobile banking via M-PAiSA and Mobile Money (in Kenya 20% of the country's GDP is exchanged via this format); Smart Dial texting of codes to access information; the proposed e-ticketing system for buses; web portals and email-based knowledge-sharing exchanges. In particular, those striving for two-way communications include the Fiji Makete 'farm to supplier' direct sales systems, mHealth comprehensive 'smart dial' system, and the Organic Matters Foundation's approach to integrate mobile phone technology into agri-training during and after the training.

The Pacific Solution Exchange

Change is on the way, however. Supporting the strategic advancement of ICTs is the Pacific Islands Chapter of the Internet Society and many other development partners and programmes, such as the Pacific Solution Exchange (PSE), a knowledge-sharing forum with over 1,300 members.

On 19 September 2012, PSE held an online discussion that lasted about two weeks on the use of 'ICTs and social media' for community programmes. Practitioners and community members from across the Pacific participated, discussing their ICT challenges and how they are being addressed with existing and planned technology. The Pacific-wide discussion was dominated by comments about the current use of mobile phones but also covered the major changes that fast-improving internet access across Pacific Islands will bring about.

This conversation received feedback from across 15 Pacific countries, and international contributors, on how ICTs and social media may be used in the Pacific to monitor and report on the effectiveness of climate change programmes. While the conversation focused on Monitoring and Evaluation (M&E), the majority of examples provided by respondents related to operational uses for implementing programmes, and how social media is primarily used for promotional and knowledge-sharing uses. The discussion also covered the significant potential to expand operational and promotional uses, and further extend into M&E and interactive communications.

The tool of choice

During the PSE discussions, respondents discussed many types of ICTs, with mobile phone opportunities

emerging as the most preferred option for use in programmes ahead of social media, email and internet, digital media, e-learning technologies, radio (though radio tops the list during disasters) and others.

The reason for this preference is improved access and capacity. An estimated 95% of Fiji has mobile coverage and a similar trend is cited in Vanuatu and other Pacific nations. On the other hand, many communities do not have internet access, so the use of internet-based social media is limited but where available it is growing fast.

Although mobile phones are arguably not the best tool for the job for some programmes, they are the tool of choice given their prevalence (versus a lack of internet capacity, for example). Compounding this situation is a lack of technical capacity, with many programme teams still navigating through the many ICT and social media options seemingly available but difficult to implement.

In future, a more diverse range of social media and integrated technologies are likely to be used in programmes as internet capacity and peoples' technical know-how improve. Already, the use of smartphones is on the rise. Also, this growth needs to be balanced with guidelines to ensure social media and personal information is used ethically and within accepted organisational strategies.

In terms of resourcing, respondents stressed that ICTs and social media are not 'set and forget' solutions, but rather tools used to improve existing systems. For this reason planning phases should determine the best ICT tool for the programme by first clarifying the desired data and outcomes. And these phases should provide longer-term planning to support the system's sustainability. Part of this resource commitment should include training, in the form of ongoing IT support, teaching staff the basics of how to use ICTs, 'training the trainers' and e-learning. ICTs are an additional way of reaching communities, and not a replacement for human interaction.

Mostly operational

The PSE discussion provided many case studies and examples. They essentially fell into three categories, with some crossover: M&E, operational and promotional. Although respondents' case studies had limited M&E and 'community report back', they did illustrate that a clear future pathway is being forged starting with the use of mobile phone SMS for M&E.

This technology is expanding to link with portals and databases either indirectly, via manual data entry, or directly, via e-forms. These approaches are usually two-way communications, though some are more interactive than others. Examples include:

- Vodafone and other organisations working with the Fiji Ministry of Health to have health agency staff provide daily 'text ins' by completing a short SMS questionnaire.
- Similarly, in Vanuatu a pilot project is using award-winning FrontlineSMS software to share daily data across a network of community health workers at 10 project sites.
- In Samoa mobiles are being used as an information transfer modem – from and to farmers.
- Fishers in Timor Leste benefit from a knowledge-sharing portal updated daily. And where there is no internet access local officers print the updates for display on noticeboards.
- Facebook groups are being used in Vanuatu for M&E purposes via the Vanuatu Rainfall and Agro-Meteorology Outlook and Climate Change Vanuatu groups.

ICTs seem to be used mostly in the Pacific for 'operational' purposes (see box), i.e. to enable the implementation and facilitation of programmes, and for this reason many approaches are not yet two-way.

Two-way and multi-way communications come to the fore via the use of social media, though in the Pacific this is used mainly for 'promotional' and engagement purposes, more so than for M&E. Successful examples of social media multi-way communications in the Pacific include the revamped UNICEF Pacific Facebook site, the Pacific Climate Change online game, and the Facebook groups for Vanuatu Rainfall and Agro-Meteorology Outlook and Climate Change Vanuatu.

While much is happening in terms of current and planned use of ICTs and social media, their use in M&E programmes in the Pacific is limited. Indeed, the current focus is more on operational and to a lesser extent promotional purposes. Thus, there is significant use of mobile phone technology to operationalise initiatives such as mHealth and Fiji Makete – and there is great potential to shift this mobile capacity more into M&E.

Social media use is still restricted by a lack of internet access, and its use is primarily promotional – though there appears to be a cultural propensity in the Pacific to adopt social media, and so this is likely to be a significant growth opportunity for programmes as internet access improves.

Finally, while modern ICTs and social media are fast expanding in their use within programmes, it is the old-fashioned radio that remains most used in disaster situations, and a highly effective medium to transfer information to rural communities. There are also exciting opportunities where old and new technologies can be combined, for example radio broadcasts on instant news combined with instant feedback – including photos and data – on social media like Twitter. ◀

Anju Mangal (anjum@spc.int), Secretariat of the Pacific Community and **Jacqui Berrell** (jacqui.berrell@undp.org), facilitator, Pacific Solution Exchange (www.solutionexchange-un.net/pacific).

In late 2012, the Pacific Solution Exchange held an online discussion on the use of ICTs for community programmes. People from across the Pacific participated. Among other things, they discussed the major changes that fast-improving internet access across Pacific Islands will bring about. The discussion received feedback from across 15 Pacific countries.

ART DIRECTORS & TRIP/ALAMY

Small islands and e-resilience

Mobile innovation on Caribbean islands

The Caribbean Mobile Innovation Project, launched by *info*Dev, aims to help mobile app innovators in the region bring their mobile apps, services and content to the market and build growth-oriented startups into successful enterprises.

The Caribbean offers a number of opportunities that make the region prime for the development of its mobile innovation ecosystem. It has a high adoption rate of mobile phones (with over 100% penetration), nearly 100% network coverage on many islands, expanding 3G and 4G networks, a growing demand for mobile applications and a policy environment that makes it easy for citizens to start a business.

The development of the region's mobile industry faces several challenges, however. Several factors are currently missing in the region that would help mobile startup businesses to thrive. First, there is limited collaboration between mobile innovation communities from different islands in the Caribbean, which is a typical feature of thriving startup ecosystems. There is also a lack of mentors and role models who can pass their industry knowledge on to aspiring entrepreneurs. Finally, there is an inadequate level of seed financing, and many developers have not been able to monetise their apps in order to develop a sustainable business.

Boosting mobile innovation

To address these issues, *info*Dev, a division of the World Bank that supports global entrepreneurship and innovation (see *info*Dev box), has launched a seven-year programme, the Entrepreneurship Program for Innovation in the Caribbean (EPIC). Funded by the Canadian government, the programme will support entrepreneurs and business incubators in the region. In particular, one of the industries *info*Dev will assist – with its EPIC Mobile Innovation Project (MIP) – is the mobile innovation sector.

The target beneficiaries of the project are mobile app innovators and aspiring and existing entrepreneurs with a particular focus on youth, who are ready and early adopters of technology. The project will nurture teams to bring their mobile applications, services and content to the market, and will then support the best growth-oriented startups to scale their companies into successful enterprises. *info*Dev and selected partners on the ground are designing a number of regional and local activities that will target early stage innovators and guide them to market readiness. The project will create a regional pool of high-growth potential mobile startups with the capacity to release their apps to the market and raise additional capital for future growth.

Over the next five years the project will include local activities on at least six islands. *info*Dev's extensive research on the technology sector in the region has shown that each island is at a different stage of its ecosystem development. This diverse market means some islands are more ready than others to benefit from the project.

These countries include Jamaica, Trinidad and Tobago, and Barbados. It should be noted that while some of the activities will occur on these three islands, the focus of the Mobile Innovation Project is on the entire region. To ensure reach throughout the region, there will be a competitive bidding process to select partners who have the scope and ability to deliver the necessary services across the Caribbean. Given the virtual nature of the mobile innovation ecosystem, *info*Dev expects this process to be feasible for most partner organisations.

Over three weeks in November and December 2012, *info*Dev hosted workshops on seven islands (Antigua, Barbados, Grenada, Jamaica, St. Lucia, St. Vincent, and Trinidad and Tobago). The workshops gave local stakeholders the opportunity to actively shape the project, specifically on individual islands. Building on two previous workshops held in the region early in 2012, *info*Dev sought the knowledge and expertise of key stakeholders on each island to discuss the local feasibility of the project's goals and activities. Over the course of these seven workshops, *info*Dev received a

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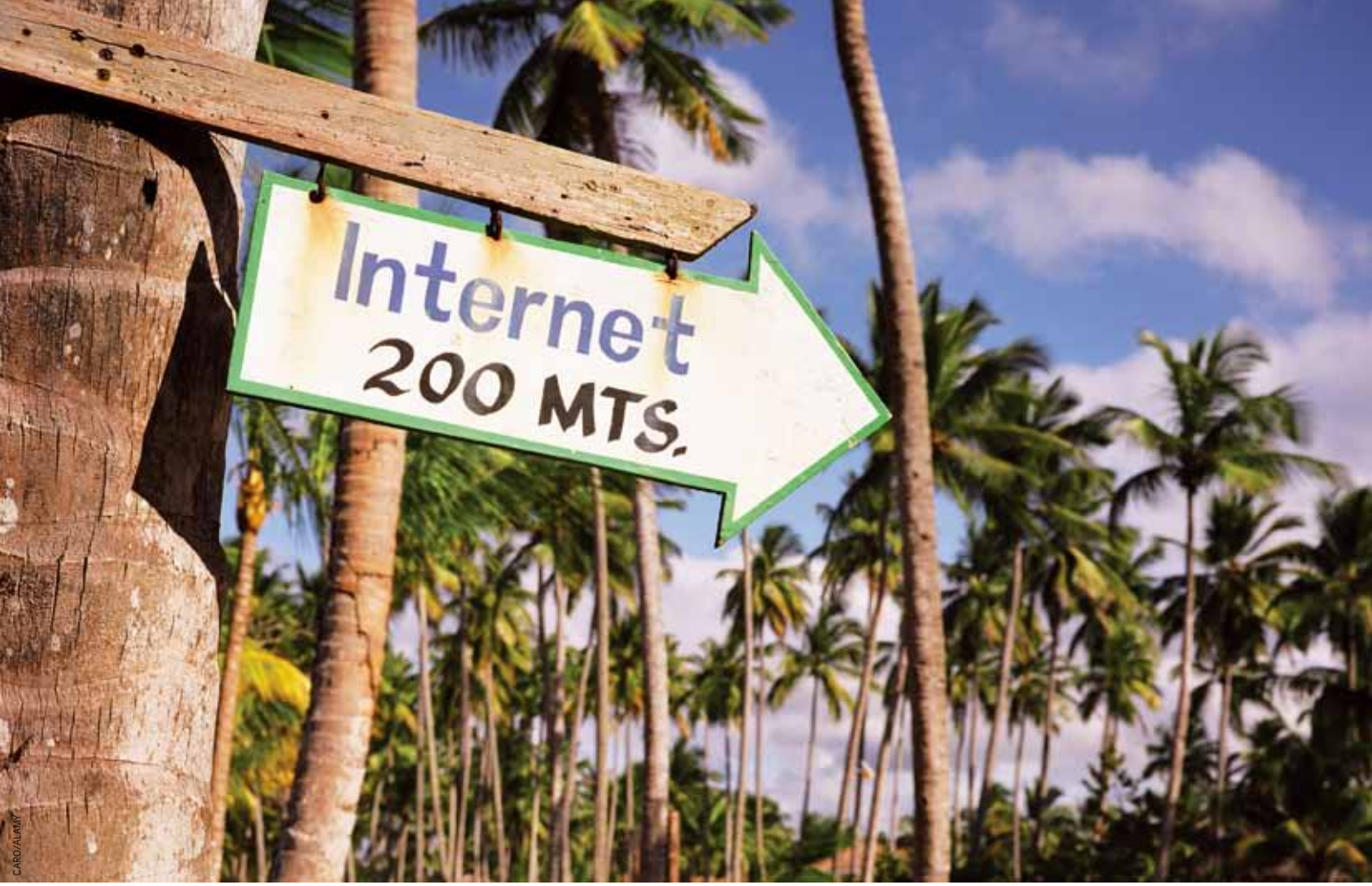
Rick Doerr (rdoerrjr@worldbank.org) is an analyst for the Mobile Innovation Project (MIP) within the Entrepreneurship Program for Innovation in the Caribbean (EPIC). He designed and developed the business plan for the MIP and is assisting in the implementation of the plan.



CARO/ALAMY

For each job created in the technology sector, roughly four jobs are created in other sectors

generally positive response about the model for the MIP. Here are some highlights of the most valuable comments:

- Skills upgrading (i.e. 'train the trainers'), access to resources, and technical assistance from *info*Dev were seen as very important during the design and initial execution of the project. Training (i.e. capacity building for local organisations) and mentorship for entrepreneurs were identified as initial high priority areas.
- Investment readiness training – i.e. teaching entrepreneurs to capitalize on local resources and create a strong position for themselves to attract investors – will be a key component in the overall effectiveness of the project.
- The dialogue and collaboration between local governments and the implementing partners should start once partners are selected, to ensure short- and long-term government support.

From mind to market

*info*Dev focuses on what it calls 'from mind to market'. These are the steps from the moment an entrepreneur has an idea to the creation of an actual product or service and its entrance into the market. The project tries to understand the current gaps in this path for startups in the region so it can fill these gaps and create a better business climate for them.

These gaps include the capacity for local and regional partners to provide the necessary services, the quantity of talent among entrepreneurs and developers in the region to generate enough investment offers for growth-oriented companies, a supply of qualified and interested mentors to provide advice to new startups, sufficient revenue generated within the project to create sustainability and a policy environment in the region that benefits the startup communities.

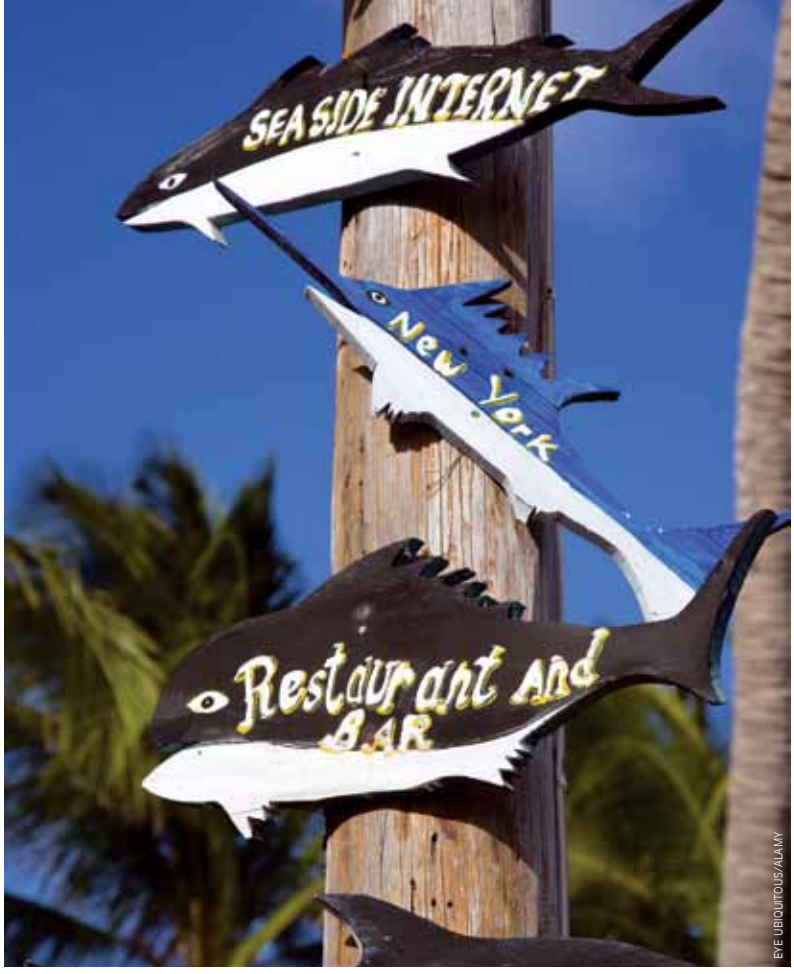
The main opportunity that will arise from the Mobile Innovation Project will be the creation of a regional pool of mobile startups with high growth potential. Not only will this create high-skilled jobs but, as shown in other technology ecosystems, it will have a ripple effect on the number of total jobs in the region. For example, in the United States, for each job created in the technology sector, roughly four jobs are created in other sectors. The project will also highlight the region as a hub for mobile app development, which will lead to further investment in the region, as well as generate revenue via taxes for island governments.

Within the context of the MIP, the development of ICT services and apps that serve the special needs of the local islands occurs through the creation of competitions that have a wide variety of relevant categories. For example, during the 2012 m2Work Hackathon, *info*Dev selected a specific area in which to move from mind to market. In this case, the initial competition focused on ideas for mobile microwork, where individuals are paid to complete small digital tasks on their mobile phones which do not require special skills or training.

Creating a regional pool of mobile startups in the Caribbean will not only create high-skilled jobs but, as shown in other technology ecosystems, it will have a ripple effect on the number of total jobs in the region. For example, in the United States, for each job created in the technology sector, roughly four jobs are created in other sectors.

*info*Dev

*info*Dev is a global partnership programme within the World Bank Group which works at the intersection of innovation, technology, and entrepreneurship to create opportunities for inclusive growth, job creation and poverty reduction. *info*Dev assists governments and technology-focused small and medium enterprises to grow jobs, improve capacity and skills, increase access to finance and markets, ensure the appropriate enabling policy and regulatory environment for business to flourish, and test out innovative solutions in developing country markets. *info*Dev does this in partnership with other development programmes, with World Bank/IFC colleagues, and with stakeholders from the public, private and civil society sectors in the developing world.



EYE UBIQUITOUS/ALAMY

The second round focused on the development of those ideas into a technology prototype. To facilitate the development of special needs apps, additional stimulation through competitions or other initiatives can encourage innovation. Another potential driver in the development of special needs apps is the government. Since governments in the Caribbean tend to be the largest purchasers of technology, they can solicit local developers to build apps in order to improve their overall efficiency, including service delivery to underserved citizens.

Building on the m2Work Challenge experience, *info*Dev also launched pitchIT Caribbean in late 2012, a pitching and business mentoring competition for the region's mobile and web entrepreneurs. The winner was announced on 18 March 2012. Trinidad and Tobago's Rick Cooper claimed the pitchIT Caribbean grand prize with his Interact XL, an online math tutoring platform.

The 'People's Choice' prize, meanwhile, was awarded to Jennifer Raffoul and Miles Abraham. They received the most online votes through Facebook for their e-commerce marketplace for handcrafted local goods, Made in the Caribbean.

Ingredients to success

Infrastructure is a key ingredient to success in mobile startup communities, but it needs to be combined with other components, including a high adoption rate of handsets. Once the infrastructure and adoption of mobile phones are in place, the next component is the creation of the service layer.

This includes app and content creation. The mobile network operators create a platform (i.e. mobile connectivity), and this provides opportunities for the development of technology to plug into the platform. The challenge in the Caribbean is the small market, which limits a startup's revenues and therefore its sustainability. But, along with the government, the local markets can provide a quick testing ground for developers to rapidly enter a market and learn from their customers with limited investment. This testing will help to further develop the product or service before releasing it in other markets or globally. ◀

Entrepreneurship Program for Innovation in the Caribbean (EPIC)

EPIC is a seven-year, CA$20 million programme funded by the Canadian government. The Canadian government has engaged *info*Dev to be the main implementer of EPIC. The programme aims to create competitive growth-oriented MSMEs across the Caribbean. It focuses on three areas of activity: mobile innovation, climate innovation and women's entrepreneurship. Financing will be available for each of these areas, as well as capacity building for incubation professionals involved in the project.

In the area of mobile innovation, *infoDev* is collaborating with a number of groups within the World Bank, including Digital Jam 2.0. The global technology community is also involved as *info*Dev has established partnerships with Blackberry and Microsoft. Regionally, the national governments on many of the islands have expressed interest in participating in the project. Finally, and most importantly, the technology communities on each island have been actively involved in the design and eventual implementation of the project.

Towards Caribbean e-agriculture

Despite high mobile penetration in Caribbean developing nations, using ICTs for business activities is still an obstacle for many smallholders in the agricultural sector.

Small islands and e-resilience

Information is the glue that holds together the members of value chains – from raw material processing, packaging and marketing, to the final consumer. Access to timely, relevant and accurate information by members of value chains is essential for the development of individual businesses and of their sector. Governments and agricultural support institutions across the Caribbean have therefore sought to develop ICT initiatives that benefit the value chains in their respective jurisdictions.

These initiatives collectively provide a variety of services – from daily commodity prices, to virtual shopping carts and mobile applications – as well as an extensive archive of market information from previous years. They seek to develop and promote investments in the agri-food sector by providing timely information to enable all stakeholders to make sound strategic, investment, management and policy decisions.

In order to avoid overlap, the Caribbean Community (CARICOM) is now leading efforts to implement a Regional Agricultural Market Intelligence System that would integrate the services offered by the many individual states onto a single platform.

Small Caribbean island states have some of the highest mobile phone penetration rates in the world. Affordable broadband internet is also increasingly available. Nevertheless, initial studies on the use of ICTs by Caribbean smallholders show that few of them in the agricultural sector are making full use of ICTs in their business activities.

MARTIN THOMAS PHOTOGRAPHY/ALAMY

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The challenge

In 2011, mobile phone penetration rates among the small island states of the Caribbean region were among the highest in the world, with some islands achieving 166%, compared with 128% in Europe, 104% in the United States and 76% in China. Broadband internet access is also increasingly accessible in many states at a reasonable cost. But despite these advancements, initial studies on the adoption and use of ICTs by Caribbean small and medium enterprises (SMEs) have revealed that few of the smallholders and SMEs in the agro-business and agro-processing sectors are making full use of ICTs in their business activities. This is a matter of concern for Caribbean governments and economic planners. While more rigorous studies are needed, sector experts from the Caribbean region have identified the following challenges:

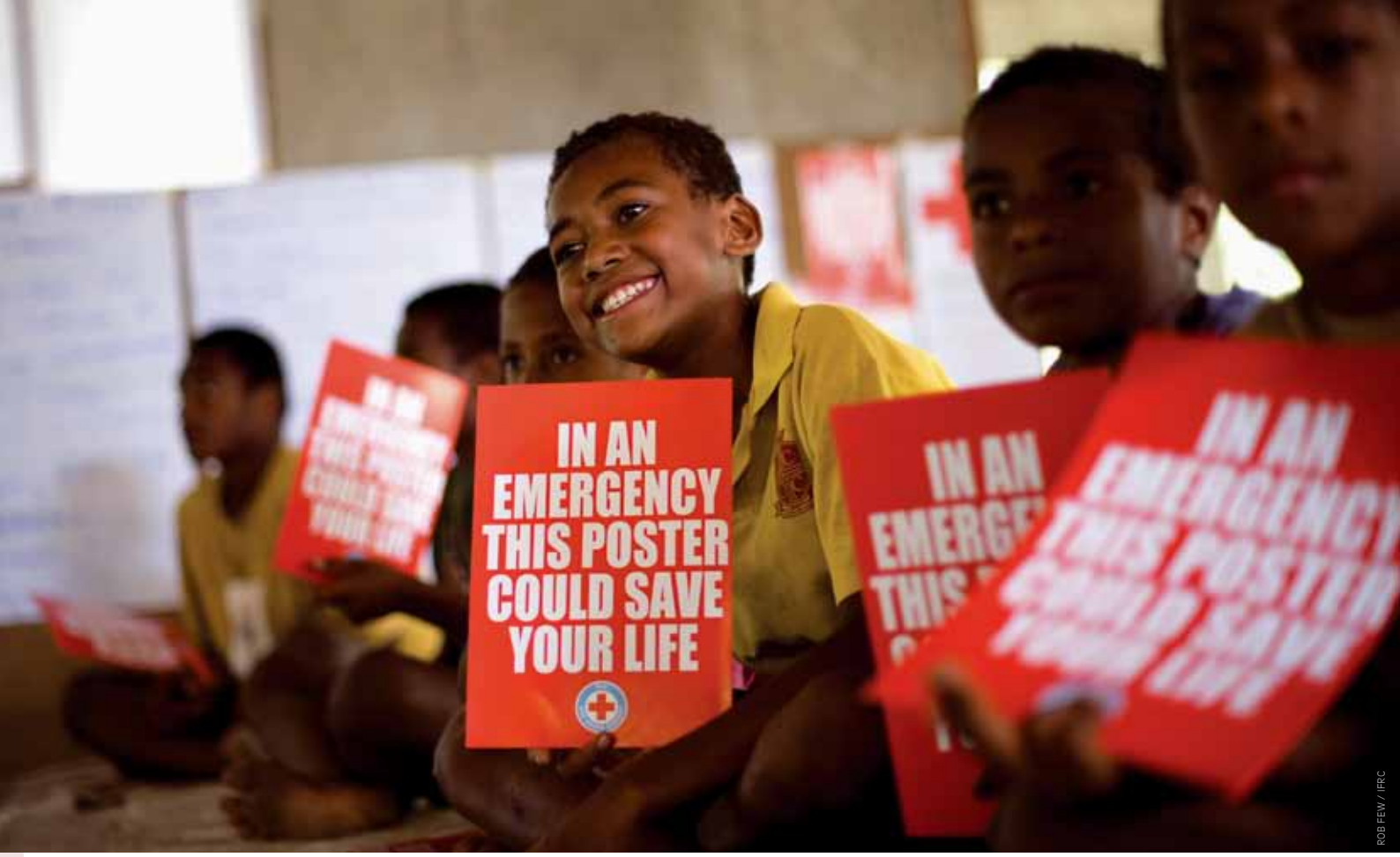
- Awareness: smallholder and subsistence farmers in the Caribbean are often unaware of existing ICT services. Furthermore, those who are aware may not be inclined to use the services because the information is not presented in an easily accessible form. Few of the farmers in the region have smartphones that can access online services, so SMS-based applications may be more useful to farmers who either do not have smartphones or are not inclined to uptake data and mobile internet packages.
- Youth and agriculture: disinterest in agriculture among youth is often exacerbated by parents discouraging children from pursuing a livelihood in the sector. As a result, young people – who tend to be more ICT savvy and eager to take advantage of new technologies – are underrepresented in the sector.
- Targeting: agricultural market reports and analyses tend be geared more to researchers, academics and managers of large operations than to small farmers and agri-business operators. The challenge is to encourage these service providers to provide more customised content, and in media formats that are most familiar to the majority of agricultural stakeholders.

Addressing the challenges

The Technical Centre for Agricultural and Rural Cooperation has set up a series of Web 2.0 for Agriculture 'learning opportunities' in the Caribbean region. Delivered by ICT Ltd, based in Barataria, Trinidad and Tobago, two of the sessions were held in Trinidad and Tobago, and two in St. Lucia. Participant feedback suggests that these training sessions have been tremendously valuable. Many of the participants have used their newly developed skills – such as RSS feeds and alerts, wikis, Google docs, VoIP, online mapping, online publishing, blogging and social media – in their personal and work environments.

Floyd Homer, president of the Trust for Sustainable Livelihoods , a non-profit organization in Trinidad and Tobago that helps people better manage natural resources, says the training session he attended helped his organisation reach a larger target audience in real time at virtually no cost. The Trust is now presenting information in YouTube videos and blogs, instead of the traditional newsletter. The Trust also trained young people at the Ministry of the Environment and Water Resources in Trinidad and Tobago to set up real-time communication activities to promote the government's Draft Wildlife Policy. Within six weeks, 1,300 people had viewed the video.

More of these kinds of training programmes are needed in the regional sector to develop the cross-functional skills needed to support sector-wide information sharing. They will also help improve the strategic understanding of how and where each of the technology tools taught best fits within the various value chains. ◀



ROB FEW / IFRC

Disaster risk management

Pacific Disaster Net is one of several initiatives that brings together a wide selection of information and tools that supports stakeholders and communities to prepare for and manage natural disasters in the Pacific island region.

Small islands and e-resilience

In October 2005, leaders of Pacific nations endorsed A Framework for Action 2005–2015: Building the Resilience of Nations and Communities to Disasters. The aim of the Framework at the regional level was to develop a coordinated approach to address the increasing vulnerability of Pacific island nations – small islands in particular – to the impacts of disasters. At the national level the aim was to develop national action plans in which governments and key agencies would work closely with local, national, regional and international stakeholders.

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The Framework became the guiding policy for disaster risk management in the Pacific and was followed by a number of initiatives to improve disaster management in the region and the quality of life of its people. In 2006, the Pacific Islands Applied Geoscience Commission, now the Secretariat of the Pacific Community's Applied Geoscience and Technology Division (SPC SOPAC), took the lead in establishing the Pacific Disaster Risk Management Partnership Network.

One of the Partnership's main objectives is to provide regional support for the development of national action plans as advocated in the Framework. These initiatives are now underway in 12 Pacific states: the Cook Islands, the Federated States of Micronesia, Fiji, Kiribati, the Marshall Islands, Palau, Papua New Guinea, Samoa, the Solomon Islands, Tonga, Tuvalu and Vanuatu.

Pacific Disaster Net

One of the key initiatives (see box for other examples) supported by the Partnership is the Pacific Disaster Net (PDN). PDN was launched in September 2008 as the new portal and growing information resource for all disaster risk management partners working in the Pacific region, including government agencies, regional bodies, non-governmental organisations and international agencies. PDN provides regional and national information in a range of formats, including contacts, alerts, documents, disaster details, calendars, contacts, and audio and visual files.

Pacific Disaster Net has two functions:

- First, it aims to support disaster risk management activities by national and regional governments and organisations at all levels in order to build communities and nations resilient to disasters; and
- Second, it forms a solid knowledge foundation on which the safe and secure future of Pacific nations can be built, by bringing together the widest selection of information sources available and supplying tools that the disaster risk management community needs.

An example of PDN's information management support during disasters is the 2009 tsunami that affected Samoa and Tonga and other areas. The PDN portal published a range of information including the minutes of the meetings held by the Samoa Interagency Standing Committee and the Pacific Humanitarian Team and operational guidelines on human rights and natural disasters, which outline the steps for providing adequate food, water, shelter and housing, clothing, health services and sanitation to areas affected by natural disasters.

Other sections of the PDN portal dedicated to the 2009 tsunami published scientific and technical reports on the cause of the tsunami, statistics describing how many people were affected and where, situation reports that update readers on the status of affected areas and articles reporting on ongoing relief efforts. Pictures of the damage caused by the tsunami were also uploaded in the 'Images' section of the portal.

Special features

PDN is maintained by SPC SOPAC in Suva, Fiji. It receives support from a variety of international partners, such as the International Federation of Red Cross and Red Crescent Societies, the United Nations Development Programme Pacific Centre, the United Nations Office for the Coordination of Humanitarian Affairs and the United Nations International Strategy for Disaster Risk Reduction.

Dedicated SOPAC staff members facilitate the information management for PDN, distributing important information to a broad range of subscribers. This information comes in the form of weekly updates and a monthly disaster risk management calendar for the Pacific region. PDN also runs an emergency repository on the Google Cloud Platform so that alerts and disaster-related information remain available during power outages.

PDN is custom built and contains features that anticipate the varying levels of internet access throughout the Pacific region. The PDN 'Local Edition', for example, is an offline version that can be run on DVDs. It therefore does not require an internet connection. The DVDs are also used for training purposes and in meetings and conferences. The only system requirement is Adobe Flash Player 8+.

The PDN 'Mobile Edition' allows users to access information on their handheld devices. It contains all the categories that are also found in the desktop version, such as articles, alerts, events, the calendar, contacts and media. RSS feeds provide easy and quick information about new content in the PDN portal. The PDN portal hosts a forum for online discussions on subjects such as disaster risk reduction, early warning systems, preparedness, response and recovery, risk assessment, and training and tools. Videos can be accessed within the PDN user interface and images are available on a Picasa page.

Five years after its launch, PDN is being redesigned in order to improve user friendliness and update the technology in line with the fast-growing volume. The redesign aims to improve access to the more than 10,000 documents available on the network, strengthen the disaster loss database, integrate a multi-lingual user interface and exchange information with systems from partners.

Challenges

Digital information management in the Pacific region is an exciting and dynamic field with a lot of potential and opportunities, but it needs additional resources and support to solve the many challenges it faces. The number of people with broadband subscriptions and the percentage of individuals who use the internet in the Pacific region vary widely. New Caledonia and French Polynesia top these lists due to support from the French government.

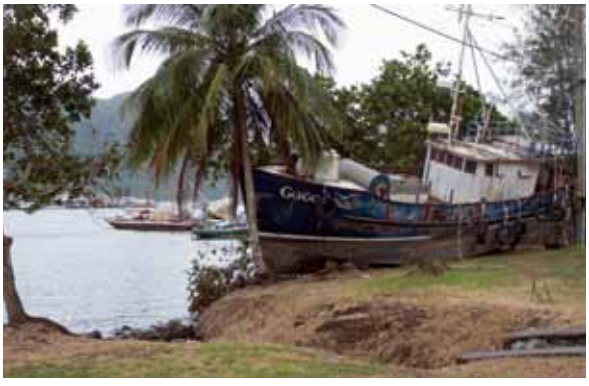
Recent figures reveal that in 2011, approximately 17 out of every 100 inhabitants in New Caledonia had a broadband subscription. In French Polynesia, that number was approximately 13, compared to Fiji and Tonga, where the numbers were just under three and just over one, respectively, or to Kiribati, where that number was less than one. New Caledonia and French Polynesia also top the 2011 list of number of people who use the internet, with 50 and 49 per 100 inhabitants, respectively, compared to 28 and 25 in Fiji and Tonga.

In addition to limited internet access, the lack of skilled information professionals is another significant challenge. Government departments in Pacific island countries and other agencies often use the term ICT as a general umbrella term to encompass not only the human side of the term, such as system developers, programmers and technicians, but also the technical side, i.e. the software and hardware.

This can lead to miscommunication and create gaps in information sharing and communication outreach, however. A government department may expect ICT professionals to update content, for example, even though they are technicians and not writers. Investing in dedicated capacities for information and knowledge management in governments and agencies will strengthen informed decision making significantly and lead to cost efficiency. ◀

Disaster risk management information and initiatives in the Pacific

Pacific Catastrophe Risk Assessment and Financing Initiative
➜ http://pcrafi.sopac.org/
Pacific Risk Information System
➜ http://paris.sopac.org
Pacific Humanitarian Team
➜ http://phtpacific.org
Pacific Disaster Risk Management Partnership Network
➜ http://www.pacificdisaster.net:8080/Plone/partnership-1
Pacific Platform for Disaster Risk Management
➜ http://www.pacificdisaster.net:8080/Plone/pacific-platform/past-events



PHOTOSTOCK-ISRAEL/ALAMY

The Pacific Disaster Net portal published scientific and technical reports on the 2009 tsunami in Samoa, American Samoa, Tonga and other areas. The portal also published statistics describing how many people were affected and where, situation reports that updated readers on the status of affected areas and articles reporting on ongoing relief efforts.

An ICT-based development framework

ICTs delivered through an appropriate development framework can help overcome the physical boundaries that limit small islands' capacity to conduct economic, political and social transactions.

Small islands and e-resilience

Attracting ICT investors is a difficult task small islands. Small islands are small markets too, and their remoteness usually means high investment costs. A strong support network is a key way to attract investors since ICT providers are more willing to respond to well-supported programmes.

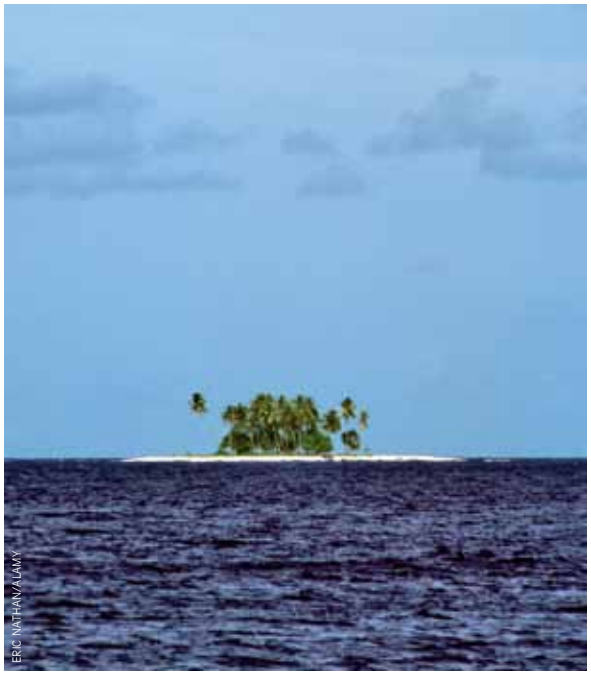
The geographical isolation of small island economies may have limited their development in the past, but information and communication technologies can now help to bridge the gap. Indeed, ICTS offer a great degree of flexibility and can help overcome or alter development barriers at four levels: social, functional (political and cultural), economic and physical.

At the social level, ICTs can benefit remote island communities by offering access to a variety of online healthcare and education services. Telemedicine, for example, provides access to medical services and advice that may save lives in emergency situations. Tele-education, such as distance learning programmes, is now available to students who cannot be physically present in a classroom, while online and offline teletraining courses offer opportunities for them to develop their professional skills.

At the functional level, ICTs can improve democratic processes, through online voting systems, for example, as well as by encouraging political participation. This can be achieved by making information more easily available and improving contact with politicians. Similarly, tele-administration, such as 'electronic town halls', makes it easier for individuals and companies to submit their tax returns, register new businesses and obtain official documents. ICTs can also promote pluralism, by enabling citizens to contribute to online debates.

At the economic level, ICTs can benefit island economies in areas such as logistics, marketing and tourism. For farmers, ICTs offer access to new markets and business services, as well as to sources of information and professional advice such as which crops to grow and what to charge for them, and which new distribution channels are available. ICTs also provide access to local product databases and modern methods of banking and financing.

At the physical level, the use of ICTs can have a positive impact on the environment by reducing the need for transport and movement.



ERIC NATHAN/ALAMY

Customised ICT infrastructure

Designing and implementing an ICT-based development framework for small islands is easier said than done. Indeed, there are major constraints, not only physical ones, such as a lack of a standard infrastructure and remoteness, but also less tangible ones, such as poor local capacity and governance capability. For example, ICTs need to be affordable and accessible if they are to bring benefits. But investors are not attracted to islands because their markets are small, and their remoteness usually means high investment costs. A strong support network from the public sector and other sources is a key way to attract investors since ICT providers are more willing to respond to substantial, well-supported programmes.

In addition, for the ICT infrastructure and services to be effectively used by island communities, they will have to be customised to local needs. This is especially the case with island societies that have retained a communal way of life, or where protective barriers against external economic and social influences need to be considered. If technologies are transferred without taking such circumstances into account, this is likely to create a 'suitability' gap.

By avoiding technological determinism, which assumes that technology is the driving force that shapes societies, island societies can enjoy significant benefits, without having to compromise their diversity. In addition, ICT frameworks that take into account local diversity help societies reorganise, and contribute to the formulation of policies based on local needs, help create jobs, expand the economic base and improve the quality of community services. The more solid the institutional structure, the more people will benefit from it since these institutions can mediate between local stakeholders and ICT providers.

Ultimately, ICTs are nothing more than new development tools, however powerful, in the hands of policy makers. As such, they provide great flexibility in service delivery, since they help to minimise distance, which is a key obstacle in island regions. Successfully setting up suitable ICT infrastructures and services on small islands requires a development framework where regional stakeholders, and technical and other expertise, are committed to its success. Moreover, they must have an open mind towards change and innovation processes and services in an island environment to which older, overly bureaucratic structures may fail to adjust. ◀

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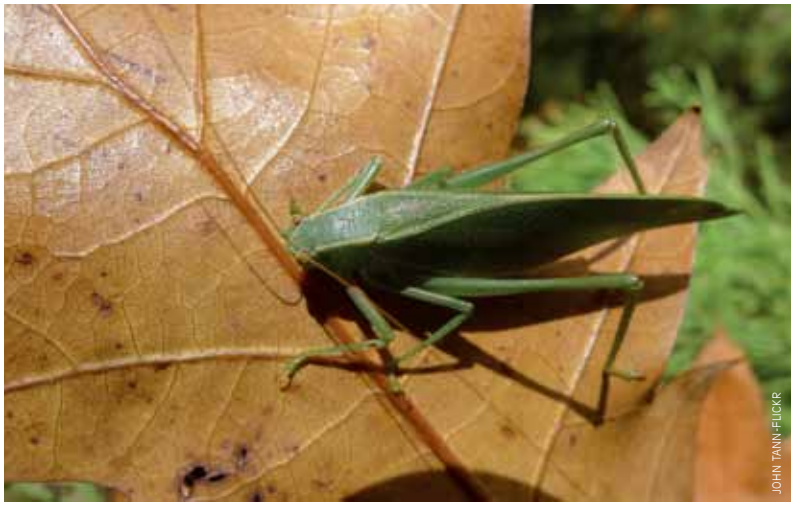
Managing plant pests

Plant pests – insects, pathogens and weeds – can threaten agricultural production and biodiversity. For farmers who need specialist advice on the identification and management of plant pests, PestNet, with its hundreds of members across the Pacific, the Caribbean and beyond, can help them.


JOHN TANN-FLICKR

Globalisation has helped to spread plant pests and diseases that can cause severe economic and environmental damage and threaten biodiversity, especially in island states. Plant pest entities include insects, nematodes and bacteria.

Small islands and e-resilience

Globalisation has resulted in increased trade and encouraged the migration of people. But it has also helped to spread many plant pests and diseases that can cause severe economic and environmental damage and threaten biodiversity, especially in island states. It is essential that effective systems are in place to assist in the fight against the increasing risk of pest invasion. PestNet, based in Fiji, was one of the first organisations to set up a system of pest outbreak alerts to help farmers identify, prevent and control invasive species – arthropods, pathogens, molluscs or weeds – that threaten the islands of the Pacific.

PestNet is a free, email-based question-and-answer forum designed to provide information for farmers, researchers and extension agents on appropriate plant pest control measures.

The network now welcomes anyone interested in crop protection anywhere in the world

The network was launched in 1999 as a crop protection service for the Pacific, moderated by volunteer plant pest experts, but since then has expanded to Southeast Asia and the Caribbean. The network now welcomes anyone interested in crop protection anywhere in the world.

PestNet's user base has grown to over 1300 members worldwide, and includes government agencies, NGOs, universities and the private sector, as well as students and farmers. Members can send messages asking for advice and information, respond to questions posed by other users, or join in the discussions on many aspects of pest control. Once approved by the moderators, the messages are shared with other members via the network's mailing list. One of the reasons for the success of the network is that subscribers receive email messages directly, so there is no need to visit the website or the Yahoo! Groups page, an important consideration in areas where internet connections are limited or unreliable.

To subscribe to PestNet, all that is needed is an email address, a computer with a dial-up internet connection and a browser. The PestNet website provides guidance on the registration process, appropriate message content and attachment format, and how to submit specimens for identification by regular mail. Over the years the network has received thousands of requests for advice or information, and the network's email archive serves as a database of questions and answers that can easily be searched by simply going to the Yahoo! Groups page and entering a keyword in the search box.

The network offers a variety of other services, including pest identification from digital images, pest outbreak alerts, advice on pest management (biological, cultural and chemical), plant protection regulations in the member countries, and lists of pests intercepted in quarantine.

Members who encounter an unusual insect, plant disease or weed can send a digital photo to the network as an email attachment. The maximum image size is limited to 75 KB so that it can be downloaded by users in areas where connection speeds are slow. To simplify the identification of the pest, users are requested to include a scale and provide additional information such as details of the host, symptoms and growing conditions.

The website provides summaries of previous discussions, arranged under four main headings: crops, pests, non-pests and pests that remain unidentified. The summaries include links to the original emails and images of the pests sent for identification, as well as the replies and recommendations of experts.

PestNet has been a resounding success. Each month, the network's email forum distributes, on average, 75 approved messages and answers. It clearly shows that the forum caters to the needs of the community of farmers in the Pacific and the Caribbean as well as professionals concerned about the growing threats posed by plant diseases, insect pests and invasive species to the farming economies of small islands around the world. ◀

Related links

PestNet (Pacific)
➜ www.pestnet.org

CariPestNet (Caribbean)
➜ www.caripestnetwork.org

Plantwise – CABI's comprehensive database of known plant pests and diseases
➜ www.plantwise.org

Resources

Small islands and e-resilience

Documents

Micro-mapping

PIERRE LESAGE/ FLICKR

Micro-mapping with smartphones for monitoring agricultural development, a 2013 conference paper from the ACM Symposium on Computing for Development, shows how people can use a smartphone-based system to assess agricultural areas such as fields or ponds by pinpointing their exact location. The system's simple and intuitive workflow can be used by laymen, which makes it possible to crowdsource geo-data on a local level.
➜ **http://goo.gl/LUnik**

e-agriculture in ACP countries
This background report reviews the general state of e-agriculture policies and strategies in selected ACP and non-ACP countries. It contains desk research that was developed in preparation for the 2013 ICT Observatory meeting and aims to provide a quick overview of e-agriculture. It identifies some of the key challenges, target orientations and key areas of support for national e-agriculture policies or strategy development as reported by the various stakeholders.
➜ **http://goo.gl/PJFtT**

Pacific ICT revolution
Digital islands, a paper published in late 2012 by the Lowy Institute for International Policy, describes some of the early impacts of the Pacific region's ICT revolution. Powerful digital tools have given Pacific islanders greater opportunity to harness, influence and promote political and social change in the region. Led by bloggers, digital entrepreneurs and social media groups in Papua New Guinea, a Pacific digital generation has emerged that is playing an increasingly influential role in society. This analysis provides an overview of the changing ICT landscape in the Pacific.
➜ **http://goo.gl/2Jezo**

Web resources

Small island reporting service
Small Island Developing States Policy and Practice is a reporting service and knowledge management project maintained by the International Institute for Sustainable Development. It facilitates the exchange of experience among small island states, keeping its subscribers informed with summarised updates sent on a daily basis via RSS feeds and email newsletters on the policy and practice of sustainable development on these islands.
➜ **http://sids-l.iisd.org/**

SIDSnet
SIDSnet is a tool for information sharing for Small Island Developing States Policy and Practice. A knowledge management platform, it focuses on decentralised content management and stakeholder engagement, filling gaps in data availability on sustainable development. SIDSnet responds to several critical challenges faced by small islands, including remoteness, isolation and geographic dispersion, poor connectivity and data management, limited human and technological capacity, and the need for greater international recognition. By registering you can access the full directory of experts, submit articles, create events and join online discussion groups.
➜ **http://www.sidsnet.org**

Vanuatu and climate change

SPOTX/ISTOCK

The Vanuatu National Advisory Board on Climate Change and Disaster Risk Reduction is the island's web portal for the latest information on the government's climate change mitigation and adaptation actions. Frequent updates on the website offer Vanuatu's citizens and regional partners easy access to project documentation, a directory of experts and online web resources. This platform also monitors research and developments in sectors related to climate change, such as agriculture, fisheries and island ecosystems.
➜ **www.nab.vu/**

Projects

Fiji Makete
Fiji Makete is a buying and selling platform for mobile phones. The application, launched in early 2013, allows farmers to access information about market pricing for their cash crops. It provides information on prices, sellers and buyers, products and registration processes. Users who wish to sell a product will receive a list of offers in a text message from interested buyers. The platform gives buyers in surrounding communities and urban areas the opportunity to see products for sale that they normally might not know about.
➜ **http://goo.gl/3hv0Z**

Q&A for farmers

AM PNIAK/FLICKR

The LifeLines Mobile Phone Q&A for farmers is an ICT-led helpline programme that aims to increase livelihood and income opportunities for rural communities through access to key decisive agricultural information. Since 2006, the LifeLines programme has been providing farmers with expert answers to their agricultural queries on their mobile phones. The answers are all delivered by voice rather than text to avoid the literacy barrier, and the aim is to provide answers within 24 hours.
➜ **http://goo.gl/EwT0M**

Wireless for Communities (W4C)
The aim of the W4C programme is to create community-wide wireless communication networks in rural India. Globally, the 2.4 Ghz, 3.3 Ghz and 5.8 Ghz frequency bands have been reserved as license-free spectrum. W4C uses low-cost Wi-Fi-based equipment and unlicensed spectrum to empower under-served communities. The project offers training on wireless mesh technology and studies the impact of deploying a wireless mesh network in a cluster-based environment.
➜ **www.apc.org/en/node/16839**

Tony Ming (a.ming@commonwealth.int) implemented ICT initiatives for the Ontario government in Canada for 30 years. He joined the Commonwealth Secretariat in London, UK, in 2008, where he and his team implement technology-related mandates issued by Commonwealth heads of government. He also provides strategic and policy advice to 54 member countries in high-priority development areas.

Adopting ICTs on small islands

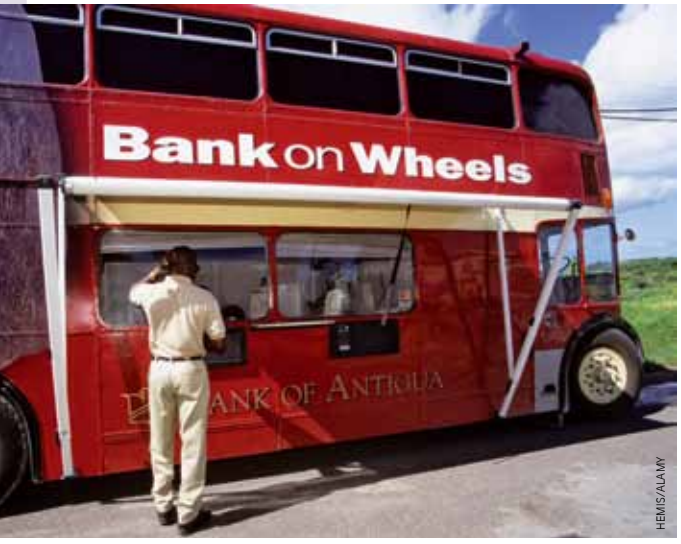
Small islands and e-resilience

What are the biggest connectivity challenges facing small islands?
➜ The biggest challenge for small island states, especially those that have many islands separated by large distances, is lack of connectivity caused by high costs and economies of scale. The best way to improve connectivity would be through satellite broadband. But that is an extremely expensive solution, especially in countries with low per capita income. There is another problem as well. There tends to be little competition in the telecom industry in small island states. This results in monopolies, and that in turn could drive prices up. Service provision, which is usually better when an industry is competitive, could also be below par.

Politically speaking, what is changing regarding ICTs for small islands?
➜ At the political level, ICTs are seen as important and necessary for economic growth. But when there are pressing priorities such as education, poverty reduction and climate change, then ICTs take a back seat. The problem is that most people think of hardware or printers or things like that when they hear the word ICTs. So we have to work hard to make sure that people become conscious of the full potential of ICTs and establish a direct link between ICTs and national development goals. Indeed, we need to clearly demonstrate how ICTs can improve lives and contribute to these goals.

Are there any recent ICT innovations on small islands that stand out?
➜ The government of Antigua in the Caribbean region has successfully launched mobile technology access centres in 2008 as part of their Connect Antigua and Barbuda initiative. These centres are buses equipped with 12 netbooks with internet access. They travel across the island, especially to remote communities and primary schools without access to technology, to provide access to technology and the internet for a variety of uses – education, news and government services. Minister of State Edmond Mansoor has described the goals of the government's ICT policy to improve the country's intellectual capital and create an open, pluralistic society, where everyone has access to information and knowledge. There are also private sector initiatives, such as the Bank of Antigua's Bank on Wheels, a mobile unit in a red double-decker bus that is equipped to process most customer transactions.

Governments in the Caribbean region have launched various mobile technology initiatives, including buses equipped with netbooks with internet connections that provide access to education, news and government services, and mobile banks equipped to process most customer transactions.



HEMIS/ALAMY

Are local entrepreneurs embracing ICT development?
➜ Perhaps not surprisingly, local entrepreneurs are only willing to embrace ICT4D if there is something in it for them. Public–private partnerships are one mechanism that could be used to create collaborative initiatives between the private sector and governments to develop local ICT industries. There are precedents. Malta and Singapore are good examples. The governments of these countries have made a conscious effort to develop their ICT infrastructures. They automated their government systems and developed ICT infrastructures that are now being managed by the private sector. The latter in turn is trying to develop key ICT industries. However, the starting point for any government that wants to adopt ICTs is the development of a national ICT strategy which is directly linked to that country's national development goals.

What is the best way to encourage people to invest in ICTs for small islands?
➜ First, as indicated above, governments and the business sector have to work together to start building an ICT infrastructure. This will automatically help to attract foreign direct investment in ICTs. Donors and multilateral organisations could play an important role as well. They can provide some of the resources, capacity building and knowledge needed to establish a knowledge society that is well positioned to function in the 21st century. Whoever is involved in setting up ICT infrastructures and creating knowledge societies should also focus on regional areas. This will help them assess the demand for ICTs and enable them to better share skills and resources and adopt critical standards. Indeed, they should be driven by the notion of 'build it once, use it many times', so systems and applications can be shared among member states in a given region.

The starting point for any government that wants to adopt ICTs is a national ICT strategy which is directly linked to that country's national development goals

Are there any particular problems in the agricultural sectors of small islands that ICTs can help to solve?
➜ Yes, because the main problem with agriculture in small island states is the high cost of production. As a result, many of these countries find it impossible to compete with large producing countries. But that's where ICTs could come in. They could help bring down the cost of production by creating a vibrant agricultural knowledge network. Farmers could consult this network to obtain advice from other farmers across the globe on how to use ICTs to create more efficient farming systems. ◀


NTR23/FLICKR

Expanding access to ICTs

The Broadband Commission for Digital Development was set up by ITU and UNESCO in 2010 to promote improved broadband access in all countries, no matter what stage of development they are in. The Commission believes that better broadband access will help countries meet the Millennium Development Goals more easily by the 2105 target date.

A 2013 report by the Commission's working group on education, *Technology broadband and education: Advancing the Education for All agenda*, highlights the reasons for using ICTs in education. It points out that although ICT skills are important for participating in the global economy, schools often focus more on gaining knowledge than using it. Students therefore don't have the right tools to become successful digital citizens in a knowledge economy.

Better access to ICTs and government policies that promote the proper use of ICTs, particularly in developing countries, will go a long way to solving this challenge, according to the report. The report recommends the following actions:

- increase access to ICTs and broadband, particularly for women and marginalised groups;
- incorporate ICTs into job training and continuing education;
- teach ICT skills and digital literacy to all educators and learners;
- promote mobile learning and online educational resources;
- development content adapted to local contexts and languages; and
- bridge the digital divide among and within countries.

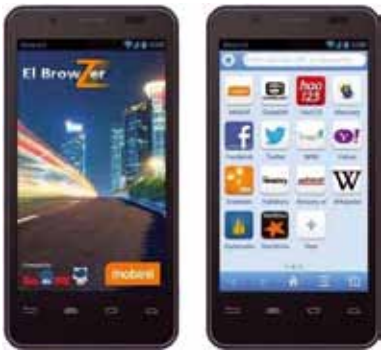
➜ http://goo.gl/gf5T7

Fast browser for low-end phones

Baidu, a Chinese web services company and the country's largest search engine, has joined forces with France Télécom-Orange to develop El Browzer, according to SciDev.Net. The new Android browser is more data-efficient than the ones usually found on smartphones. According to Tania Aydenian, mobile partnerships manager at Orange, the browser's ability to compress data can reduce the amount of data consumed by 30% to 90%. This makes it cheaper for users to navigate the internet, and it benefits operators because it frees up valuable bandwidth. The browser also simplifies web access by using one-click links to preferred services

The browser's main target group is consumers in Africa, the Middle East and Asia, where low-end versions of smartphones are becoming increasingly popular. Indeed, El Browzer was launched in Egypt in February 2013. Arabic and English versions of the free browser are available pre-installed on Android devices sold via Mobinil, an Egyptian firm partly owned by France Télécom-Orange. A French version is also being developed.

➜ Original article http://goo.gl/iV1rX



Multi-functional mobile masts

According to AlertNet, a free humanitarian news service, mobile-phone masts could be used for a variety of new innovative purposes in Africa. In an article published in February 2013, AlertNet describes findings in a study published in the Proceedings of the National Academy of Sciences (PNAS) in February 2013, which suggest that mobile masts could be used to measure rainfall in areas without rain gauges.

AlertNet says that a general lack of rain gauges across Africa hinders countries' ability to monitor water resources and improve early warning systems that could save lives and cut the cost of flooding. Indeed, PNAS researchers claim that their findings can improve the situation in Africa and other places that lack a network of rain gauges.

The PNAS study estimated average rainfall intensity from telecommunication network data for the Netherlands, according to AlertNet, taking advantage of the fact that rain causes signal losses between mobile-phone masts. These estimated rainfall maps were then compared with those generated from radar and rain gauges. The researchers hope their study will persuade mobile-phone companies to release relevant data freely for use in research and to measure rainfall.

Aart Overeem, lead author of the study, warns that the rain-measuring technique must be studied further both over a longer period and in places such as the tropics, where mobile-phone masts often operate at lower radio frequencies. At such frequencies, there is a more complex relationship between rain and signal weakening that could affect the accuracy of rainfall maps.

➜ Original article http://goo.gl/uq90Y

The world in 2013: ICT facts and figures

THE REBOOT-FLICKR

ITU's facts and figures report features estimates for its key telecommunication and ICT indicators. It highlights the latest global ICT facts and trends and includes figures on internet use, gender, fixed and mobile broadband subscriptions and prices, home ICT access and more.

The report predicts that mobile subscriptions will exceed the world population by 2014. More than half of all mobile subscriptions are now in Asia, which remains the powerhouse of market growth, and by the end of 2013 overall mobile penetration rates will have reached 96% globally, 128% in the developed world and 89% in developing countries.

With many markets saturated, and penetration at over 100% in four of the six ITU world regions, mobile-cellular uptake is already slowing substantially, with growth rates falling to their lowest levels ever in both the developed and developing worlds.

➜ http://goo.gl/2kzgo

Cloud services in Africa

MARC E MARC/FLICKR

Pamoja, the cloud services business unit of Pan-African ICT enabler SEACOM, has officially launched its business model and go-to-market strategy in Johannesburg, South Africa, according to *IT News Africa*, with management offering a detailed explanation of how SMEs and partners form part of the plan to build a cloud services market for the continent.

The Pamoja business model is based on the aggregation and wholesale delivery of cloud services to the African market. The key tenets of the model are business value services, connectivity services and cloud computing services.

Pamoja uses a one-stop-shop approach. This means that SMEs, the ultimate end-users of Pamoja's services, benefit from the fact that all their ICT needs are serviced by a single supplier.

Pamoja's cloud services will be provided via the company's network of data centres, according to *IT News Africa*. The first cloud platform is up and running in South Africa, and the second platform is planned for Kenya, after which subsequent platforms will be set up based on demand.

➜ Original article http://goo.gl/lQaip

ICTs in Ghana's rural development

Ghana was one of the first countries in Africa to reform its ICT sector. The country's government liberalised telecommunications in the 1990s and introduced its ICT for accelerated development policy in 2003.

These measures attracted investment from the private sector, which has become actively involved in modernising Ghana's ICT infrastructure. This paper on the role of ICTs in Ghana's rural development takes a detailed look at ICT developments in rural Ghana since the turn of the century.

Much has improved in Ghana's ICT infrastructure since 2000. By late 2011, the penetration rate of mobile telephony was 75%, up from 52.4% in 2008. ICT services are more decentralised, and this has created new business opportunities for small businesses. Many rural banks are now automated and networked. As a result, employees at small businesses, traders and farmers no longer have to carry huge sums of money on them for transactions. They can now deposit money at one bank and withdraw from another.

ICTs have made distance learning possible in rural areas in Ghana. This has huge educational implications since 56.2% of the country's population live in rural areas. It has opened up learning opportunities to people who would otherwise not have had access to education because they live too far from educational centres and have limited financial resources.

Distance learning is also keeping people in rural areas since they no longer have to move to urban areas to upgrade their knowledge and skills. And people are more willing to accept work in rural areas for the same reason.

The next step is to build a more robust ICT infrastructure in rural Ghana. The paper recommends improving access to electricity and making ICT equipment internet access more affordable, since telecentres and internet cafes are still the main means of accessing ICTs.

➜ http://goo.gl/k4hA6

EIFL: KNOWLEDGE WITHOUT BOUNDARIES/FLICKR

53 % of Papua New Guineans who access radio do so on mobile phones. Households there have more access to mobile phones than radios.
http://goo.gl/G9vw9

23 % fewer women in developing countries are online than men. In Senegal, 10% of women and 20.2% of men have access to a computer.
http://goo.gl/bOVOj

8 in 10 women in developing nations who do have web access reported using the internet to further their education.
http://goo.gl/tFEqT

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