

AN INTRODUCTION TO TECHNOLOGY STEWARDSHIP FOR ICT ADOPTION AND USE IN AGRICULTURAL COMMUNITIES OF PRACTICE

DOEA KURUNEGALA-NORTH CASE STUDY





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Key Terms

Technology Stewardship

Technology stewardship is a leadership role that almost any practitioner can assume. In this role, a Technology Steward is someone who works with a community of practice to encourage the adoption and use of digital technologies for communications, training, and knowledge transfer.

Technology Stewards need to know how to engage their community members to identify opportunities and challenges; they need to be able to acquire and configure appropriate digital information communication technology (ICT) platforms to support innovative practices; and they need to be able to evaluate and report the outcome of their efforts back to the community and to organizational sponsors. This course is designed to introduce practitioners to these basic skill sets and to equip them with the means necessary to begin an exploratory campaign using low cost ICTs with their own community of practice.

The medium range goal of implementing a technology stewardship program is to promote experimentation with digital ICTs, and to build capacity for innovation within a community of practice. Technology Stewards should aim to create a culture of innovative thinking among their community members with the long term objective of enhancing the range of real choices available to practitioners when it comes to sharing information and mobilizing knowledge with digital ICTs.

Livelihood Communication

'Livelihood communication' refers to many types of interaction that take place between people about the activities and demands of work life. Examples range from scheduling meetings, sharing techniques or new methods, or passing on vital information about the marketplace or changes in government or administrative requirements. While these interactions include aspects of casual personal exchanges, livelihood communication has a central purpose to share information and knowledge to support learning and work-related decision making.

Technology Stewards talk to their community members to identify priority needs or concerns related to livelihood communication and its challenges. They then select and introduce practical, affordable technology to address these challenges through an intervention called a campaign. Campaigns begin as limited duration, small-scale interventions intended to achieve a specific objective in relation to the community priority. Over time a campaign might evolve into a sustained program of ICT-enabled communication but this is not the only measure of success. A Technology Steward is successful if he or she can raise awareness of possibilities with ICTs and expand the range of choices community members consider when responding to challenges related to livelihood communication.

Communities of Practice

An important aspect of livelihood communication is sharing information that will help us to improve our practices, to improve outcomes, and therefore contribute to the overall improvement of our situation; in other words, to sustain and improve our livelihoods. When we share information of this type, we are taking part in a learning experience. In other words, the need to exchange information for purpose of learning is an important motivator for livelihood communication.

A group that comes together to share information for purpose of learning is also known as a community of practice:

Communities of practice are groups of people who share a concern, a set of problems, or a passion about a topic, and who deepen their knowledge and expertise in this area by interacting on an ongoing basis.

-Wenger E., R. McDermott, W. Snyder (2002). Cultivating Communities of Practice. Harvard Business Press. (p. 4)

When we talk about community in this course/workshop, we generally mean community of practice as defined here. We can abbreviate the term to COP.

Campaign

Technology Stewards assist the community to adopt technology or new technology practices into everyday activities through campaigns. A campaign is a limited duration activity with a well-defined objective related to the role of ICT and a specific community of practice.

A campaign consists of three core activities:

- Community engagement
- Technology training and rapid prototyping
- Campaign management and evaluating outcomes

A steward must work closely with their community to identify its needs and challenges, and to help prioritize these when choosing a focus for the campaign. The key to success is a well-defined objective that responds to a need identified by the community members. The guiding principle here is *Vision before technology*.

Low Cost ICT

A low cost ICT is one that is affordable and practical for a community of practice. Technology Stewards are encouraged to use technology that is already available to community members (e.g., mobile phones) and to enhance the value of these devices by introducing new practices and services with them. The guiding principle is *keep it simple and affordable* for the community.

Rapid Prototyping

Technology Stewards play a key role in implementing new practices with ICTs through a process of trial and error with quick turnaround times. Testing and refining a technology platform quickly helps to keep up interest and momentum, reduces costs, and provides immediate feedback on the design of the system in order to improve it for users.

Evaluation

When leading a campaign, a Technology Steward is responsible for managing the overall process and evaluating the final outcome. Responsibility is divided into five phases: (1) pre-campaign phase, (2) community engagement phase, (3) technology prototyping phase, (4) campaign phase, and (5) post-campaign phase. In addition to their own role, Technology Stewards must also be mindful of three other important influences on a campaign: (1) support of the sponsor; (2) community readiness; (3) suitability and reliability of the technology. Campaign management and outcome evaluation is based on a plan that the steward develops and implements with a campaign. At the end of a campaign, the steward reports the results of the campaign back to the community members and to the sponsoring organization, with results informing the next phase of the campaign. The guiding principle here is *understand failures and build on successes*.

Preparing to be a Technology Steward

Sometime individuals take up the role of Technology Stewards on their own without having any specific training for it. That is perfectly acceptable, and we have seen this before in Sri Lanka as well as other places. However, the goal of this short course is to provide you with some basic training in the techniques of technology stewardship should you decide to take up this role with your community.

The teaching team has conducted training like this short course in a number of different settings and it is part of an ongoing research project to develop an effective technology stewardship strategy in Sri Lanka. Your participation in the course will provide us with important lessons about the course curriculum, training materials, and format. We appreciate you taking time to contribute to this research and we hope that you will find the course helpful in your own work.

Case Study: DOEA North

The following case study is based on an actual technology stewardship project conducted in partnership with the Department of Export Agriculture in 2014. The details in this case study will be used in the first session of the Technology Stewardship Training Course to introduce you to the principles and practices of this valuable leadership role.



Training session for DOEA Technology Stewards at Wayamba University

PART A

The Community of Practice

The DOEA-North jurisdiction covers the Dambahera, Madahapoala, Omaragolla, Panliyaddha Grama Niladhari (GN) divisions of the Melsiripura District Secretariat division. There are about 300 farmers registered in the DOEA-N. This community mainly consists of ginger, pepper and cinnamon farmers.



Figure 1: Community locations at DOEA-N in Kurunegala District

Some of the significant agricultural and ecological related problems in the Melsiripura division include:

- Limited rainfall leading to water scarcity;
- Land availability is limited for the ginger cultivation. While farmers are willing to cultivate ginger in their paddy lands, the DOEA cannot provide subsidies to these farmers as it is prohibited by the law of the country to use paddy lands for other purposes;
- Over the years ginger cultivation has reached self-sufficient levels, so the DOEA has had to stop promotional activities (e.g. subsidy schemes) for ginger;
- Poor market opportunities for ginger because of a government decision to import ginger, resulting in farmers receiving lower prices for the it.

The district also faces a number of economic and social challenges that include:

- Poor infrastructure poor road facilities;
- Transportation problems and high cost for transportation when farmers need to transport harvest to market;
- Officers from the DOEA cannot reach certain parts of the area easily with limited allowance for fuel and transport;
- Poor market access/opportunities;
- Poor access to mobile services;
- Alcoholism;
- Many couples start marriage in very young age. High teenage pregnancy;
- Chronic Kidney disease (this condition is a serious health issue in the North Central Province of the country);
- Drinking water problem.

While this area can be defined as a community by its geography, it is also comprised of several possible *communities of practice* (COP). Farmers in this area have a shared interest in and commitment to a livelihood communication in several domains: type of crop, region-specific issues listed above, and as farmers generally. These are the kinds of challenges and issues of interest in which they might have a shared sense of commitment.

For example, all ginger farmers in Melsiripura District might form a community of practice. Or different types of farmers from Dambahera or Madahapoala with common concerns (e.g., water management or market access) might belong to a community of practice. A group of Technology Stewards themselves might belong to a community of practice. It is possible for a farmer to be a member of several communities of practice at the same time. In other words, a COP is essentially a group supports and sustains livelihood communication within a shared domain of interest or practice.

<u>Go To Worksheet 1.1(a)</u>

PART B

The Challenge for Livelihood Communication

In 2013 the Department of Export Agriculture-North working closely with the community and in collaboration with Wayamba University of Sri Lanka (WUSL) held a community meeting and identified a priority need for improving the timeliness and frequency of livelihood communication between DOEA-N Extension Officers and their beneficiary farmers. At the meeting it was suggested that communication technology might help to



Figure 2: Community meetings in "DOEA" at Madahapola in Kurunegala District

improve general messaging regarding farmer group meetings, subsidiary schemes, plant materials distribution, fertilizer recommendation and crop price notifications. One ongoing challenge for the community and the Extension Officer is the cost and time it takes to reach the community with information updates either by post or through personal visits. A cost-effective method of exchanging short messages could reduce some of these costs and the time requirements.

PART C

ICTs in the Community

More than 90 percent of ginger farmers in the Kurunegala district, in general, use mobile phone as a source of information sharing in their day-to-day life. Different levels of education do not appear to affect this behavior significantly, or in other words, the level of education does not seem to be a barrier to use mobile phones. This raises the possibility that the mobile phone and its built-in features (such as SMS) are a readily available technology that might be used more effectively to communicate with farmers.

Go to Worksheet 1.1(b)

PART D

Community Orientation and Campaign Objective

At the community meeting, both the Extension Officer and community members agreed that the most important need was to improve communications for <u>scheduling meetings</u> and providing the community with updates on other gatherings. Secondary needs that were raised during the meeting included finding an faster, more efficient way to <u>access expertise</u> by contacting the Extension Officer with questions about pest management, diseases, or cultivation techniques. The Extension Officer also indicated that it would be helpful in some instances to be able to reply with a single answer back to the whole group rather than on an individual basis. The Extension Officer also imagined the possibility of <u>creating a content database</u> of frequently asked questions based on message inquiries he received from the community.

The next step in the process was for the steward to work with the community members to formulate a clearly-worded campaign objective based on the identified priority. In this case here is how the objective was worded: we need to find a way to improve the timeliness and reduce the cost of exchanging messages between the Extension Officer and community members when scheduling meetings and responding to inquiries about crop management for farmers in the Melsiripura DS Division.

A well-defined campaign objective includes three details:

- sets specific targets (improve timeliness and reduce costs);
- for a specific activity (exchanging messages for scheduling meetings and responding to inquiries);
- with a clearly defined communities of practice (ginger, pepper, cinnamon farmers in Melsiripura DS division).

Go To Worksheet 1.2

PART E Primary Communication Mode and Rapid Prototyping

After the steward and the community identified the key priority and campaign orientation, the next step was to acquire a technological solution that could help meet the objectives of the campaign (exchanging local crop price information, to advice on disease control, general inquiries, announcements, so on and so forth).

The steward and the community decided to plan a campaign plan using text messaging (SMS) as an attempt to improve the timeliness and reduce costs of livelihood communication between Extension Officer and community members. Wayamba University of Sri Lanka (WUSL) provided DOEA and the Technology Steward with access to a low cost, open source text messaging platform called FrontlineSMS. The next step for the steward was to work with a graduate student from WUSL to implement the SMS service using FrontlineSMS in a process called rapid prototyping (Figure 4).



Figure 4: Rapid prototyping exercise with WUSL and DOEA community group in Madahapola

When planning a campaign, the Technology Steward needs to identify the primary communication mode in relation to the community orientation and campaign objective. In this case the campaign objective was *to improve the timeliness and reduce the cost of exchanging messages between the Extension Officer and community members.*

A campaign can involve complex information exchanges but it may help to simplify the planning process by considering four basic types of interactions:

- 1. Campaigns that support participation in conversations and activities;
- 2. Campaigns that support the creation, storing, sharing of artifacts;
- 3. Campaigns that support real-time (or near real-time) communication;
- 4. Campaigns that support asynchronous (post & wait) communication.

We can draw a matrix to help with this classification process (figure 5):



Figure 5: Classifying communication modes

Identifying the primary communication mode helps the Technology Steward to acquire a suitable platform by listing the requirements and processes needed to implement the system to meet the needs of the campaign. Moreover, when starting your first campaign it may be helpful to plan it around an objective that is based on <u>one primary communication</u> <u>mode</u>. (Campaigns that involve more than one mode can be complicated to plan and difficult to evaluate).

In the case of DOEA-N, the primary mode can be classified in quadrant 1 on the matrix: messaging is intended to support a conversation between the Extension Officer and the community members but it does not require immediate response or acknowledgement.

Knowing this, we can assume that community members need an easy way to send and receive text messages from Extension Officer. The Extension Officer needs an easy way to obtain the phone numbers of the community members in order to send them messages of interest to their particular community of practice (ginger cultivation). We also can assume that there is no immediate need in this campaign to implement a system that will store or curate content.

Following this logic, the following basic requirements were identified in relation to the communication mode and the FrontlineSMS platform:

- The Technology Steward needs to create a database containing phone numbers of community members interested in exchanging messages with the Extension Officer;
- The database must contain a subgroup for farmers specifically interested in ginger cultivation messages.

Creating a database of phone numbers with FrontlineSMS can be done in several ways. However, to save time and effort for the Extension Officer it was decided that two other requirements be implemented with the system:

- Community members need to be able self-subscribe (and unsubscribe) to receive messages sent from the Extension Officer related to meetings and other news;
- Community members need to be able self-subscribe (and unsubscribe) to a subgroup in order to receive topic-specific messages about ginger cultivation from the Extension Officer.

The steward then installed FrontlineSMS and developed a prototype with these specific requirements implemented using a keyword feature on the platform. A short series of tests was conducted with a few community members to ensure the system worked as intended. It was then made ready for the campaign. In this case it was possible to complete the rapid prototyping during a community meeting as part of the campaign planning.

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PART F Planning a Campaign Strategy

Following the rapid prototyping phase the steward then began to plan a campaign to introduce and start using the text messaging system with the community.

A campaign is an intervention of limited duration intended to address a specific objective identified together by the community, the steward, and the sponsor. The campaign provides an opportunity to test and evaluate a possible solution without requiring a long term commitment of time or resources. *For the initial campaign especially, rapidity and simplicity are important in order to manage costs and expectations*. A campaign also enables the Technology Steward to collect feedback through interviews, surveys, and tracking usage of the system through software records to better understand how the community can best achieve its objective with (or without) the introduction of the technology.

A campaign consists of four variables: (1) Sponsor, (2) Technology Steward, (3) Community and (4) Technology (Table 1).

Sponsor / Partner Organization	Technology Stewards	Community	Technology
Department of Export Agriculture (North)	(Chandana, Herath)	Ginger, pepper and cinnamon groups at Melsiripura DS division	FLSMS

Table 1: Summary of Campaigns

In the DOEA-N case, it was then decided to base the campaign around a text messaging (SMS) system because most community members have access to a mobile phone with SMS capabilities and there was consensus that this would be worth trying. Text messages can be sent quickly and to a relatively large number of recipients at a low cost compared to individual voice calls. The steward was supported by DOEA and with help from WUSL, which provided training and access to FrontlineSMS and air time to support a limited duration messaging campaign.

After the rapid prototyping was complete the campaign launch was planned to coincide with the cultivation of the ginger crop when it was expected that the messaging system would have immediate value for the community.

Posters were produced and distributed in the community to promote the campaign and provide information about joining the messaging groups (Figure 6). The poster describes the campaign and explains how farmers can self-subscribe to the messaging system by sending a keyword to FrontlineSMS.



Figure 6: Poster prepared to promote the DOEA-North campaign

The campaign was planned to run for 16 weeks. The Technology Steward hosted a community meeting to launch the campaign and then explained and promoted it to the community members during meetings throughout the duration of the campaign. Through these meetings the steward was also able to carry out process evaluation methods to quickly identify and resolve difficulties or questions that community members had about the campaign.

The steward also conducted regular review of data collected on the FrontlineSMS software to evaluate how the system was being used. At the end of the campaign the steward met with the community to discuss the results, to identify the strengths and weaknesses of the campaign, and to conduct a final outcome evaluation.

The steward collected data, made notes during the community meeting, and provided a report back to the community, to DOEA, and worked with WUSL to conduct a final assessment of the campaign in relation to its objective.

Go To Worksheet 1.4

Results and Conclusion

It was found that short messaging did enhance information exchange by improving timeliness and reducing costs but that some in the community were slow to adopt it. However, the community remained interested in continuing with the system and a decision was taken to launch a second campaign. Support was provided by DOEA and WUSL for this second campaign.

The community and the steward were also able to discover from the results of the first campaign that a voice-based messaging system might better serve that portion of the community reluctant or unable to use SMS. The second campaign then looked to introduce an open source Interactive Voice Response (IVR) system in addition to the SMS system.

Over time, it is hoped that the steward will continue to work with the community and encourage them to incorporate SMS as a regular part of their communication practices. As they become more familiar with the system and gain confidence using it, the Technology Steward, with support from the sponsor and the community will have an ongoing role to encourage and support the community in trying other innovative uses of text or voice messaging and perhaps explore other forms of information sharing using the campaignbased approach.

As inexpensive smartphones become more widely available in the community it is expected that many new possibilities for affordable, enhanced communication will be possible. Over the longer term an active Technology Steward can play an important leadership role helping their community gain a greater sense of confidence and choice in using these new ICTs to improve their livelihood communication practices.