

SCIENTIFIC ANIMATIONS WITHOUT BORDERS AND COMMUNITIES OF PRACTICE: PROMOTION AND PILOT DEPLOYMENT OF EDUCATIONAL MATERIALS FOR LOW-LITERATE LEARNERS AROUND ADAMA (ETHIOPIA) BY ADAMA SCIENCE AND TECHNOLOGY UNIVERSITY

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ABSTRACT

Ensuring the success of deployment initiatives of specific programs in developing countries comes with the commitment of local, public and private institutions. Scientific Animations Without Borders (SAWBO) creates educational content for low literate learners, in their own local languages that can be deployed on video capable devices by in country groups. In other words, SAWBO creates content, for local communities of practice to use in their educational programs. Although SAWBO creates and deploys this content virtually, it is the domain of local groups to develop strategies and approaches for local and meaningful impact. Establishing partnership between local stakeholders, public and private institutions bring new opportunities to the deployment of educational materials in developing nations. In regards to this statement, the consultative group on a project entitled “Promotion and Pilot Deployment of Educational Materials for Low Literate Learners around Adama” offers a case study in commitment between participants. This paper explains the opportunities for, and challenges to, creating a community of practice and making decisions between public and private institutions leading to the deployment of educational materials in a form of animated videos around Adama City in the region of Oromia, Ethiopia. This paper presents the willingness of local, public and private institutions to enter into partnership to participate in a specific deployment of a project perceived to be beneficial for low literate learners in their communities. The report of the consultative meeting suggests that while initiatives and perceptions may differ among the different groups involved in the deployment, common goals facilitate the decision making to move forward. This paper is part of an ongoing effort to develop community of practice models, for deployment of cross-culturally adaptable educational animations, with the intent of reproducing similar approaches in other regions of the world.

KEYWORDS

ICT for Development; ICT Projects; ICT4D; Crowdsourcing in International Development

1. INTRODUCTION

Traditionally, agricultural extension has played an active role in transferring and disseminating information and implementing agricultural technologies in developing countries. In today's global context these efforts are insufficient (Cho and Bolan, 2002). New local stakeholders are establishing linkages with universities and other institutions to have a voice in international development. The capacity of these new participants to find innovative ways to interact with low literate learners is bringing novel approaches to international aid. Programs for achieving new methods of deployment information in the hands of farmers, women, entrepreneurs, and other individuals, comes from local universities, civil societies, community based organizations (CBOs), NGOs, and other new providers. This was the approach taken by Adama Science and Technology University (ASTU) in Ethiopia and a program called "Scientific Animations Without Borders" (SAWBO) based on the University of Illinois at Urbana Champaign, which provides educational materials in a form of animations in local languages. SAWBO develops educational animations on a diversity of major world topics/problems, along with well-documented solutions, works with local partners to voice-over these for these animations, and then makes these educational materials freely available online. These videos can be downloaded through both of SAWBO's websites, a full version and a mobile version (for people with low bandwidth) or through the online journal known as the "Sustainable Development Knowledge Interface" (SusDeViKI) (Bello-Bravo et al., 2010, 2011; Bello-Bravo and Pittendrigh 2012; Bello-Bravo & Baoua 2012). SAWBO has been working with ASTU to create local languages variants of their videos, in Ethiopian languages, as well as to create new videos appropriate specifically within the Ethiopian context. All videos have and will be made freely available for educational purposes and can be downloaded and used by any local education programs or individuals wishing to use these materials. The organized community of practice, among in country partner groups, represents a logical mechanism to effectively deploy educational materials to target group within local communities.

To establish a local community of practice, for educational content, around Adama City within the Regional State of Oromia, between local stakeholders, public and private institutions in international development, ATSU organized a consultative meeting on December 2012 to inform local groups about a project entitled "Promotion and Pilot Deployment of Educational Materials for Low Literate Learners around Adama". This initiative was based on the deployment of educational materials provided by SAWBO and translated into local languages by volunteers at ASTU. This project was implemented by ASTU in collaboration with an NGO called "Forum on Sustainable Child Empowerment Adama Area Program Office." Thus, educational animations are developed by SAWBO on universal needs that affect individuals in developing countries and on topics of importance in the developed world, including but not limited to: cholera prevention, malaria prevention, tuberculosis, proper use of medications, and other agriculture animations for the prevention of post harvest loss. In this paper, we discuss the establishment of a community of practice, headed by ASTU, for the Adama region to establish the preliminary steps and decision taken by the participants in the consultative meeting on the promotion and deployment of select SAWBO animations in two major languages in Ethiopia, Amharic and Afan Oromo, around the city of Adama. Additionally, we present the process and outcomes of the report on the training of extension agents and health care providers that participated in the project.

The methodology proposed in the consultative meeting was based on four phases: promotion, deployment, evaluation and large scale deployment. To support and elicit the discussion among stakeholders on the nature of the videos, the target audience and alternative approaches for deployment around Adama, ASTU introduced the animated educational

videos in the two local languages so all the participants in the consultative meeting could understand the content of the animated videos. To facilitate the discussion a facilitator asked questions related with the feedback of the educational videos; strengths and weaknesses in terms of content, length of the videos, cultural context, relevance of the topics and mode of transmission and dissemination. Emphasis was given to the target audience for the deployment of the videos. In addition, to identify the most suitable target audience for this deployment the discussion followed methods and approaches of deployment. In Africa, rural radio is very popular mass media but videos are used to inform decision makers – see Ramírez & Quarry (2004) and Rivera (2006). The idea of prevention of diseases through educational animations was very innovative for the stakeholders. Thus, being able to show the videos in different devices was a more flexible option for the deployment. Lastly, participants expressed their interest and roles in the pilot deployment.

In this article, we explain the process of deployment of innovative educational materials starting from the selection of the participants; local stakeholders, private and public institutions, interested in having a voice and a role in the deployment of SAWBO animations, to the outcomes. We summarize the decision made by the participants in the consultative meeting based on the reflections of the strengths and limitations of the deployment. The ultimate goal was to provide suggestions for the pilot deployment based on the understanding of the links that exist between universities and other actors that have access to communities. We reflected on the importance of using appropriate educational materials according to the needs of the local communities. We present the report on the training of the different participants that were part of the deployment of the animations. Finally, we explain the potential for this strategy in the development of reproducible communities of practice that can use the SAWBO educational approach in their programs.

2. A MODEL FOR A REPRODUCIBLE SYSTEM FOR COMMUNITIES OF PRACTICE (COP)

Community of practice traced their origins in constructivism and social interdependence (Knowles et al., 1998; Oliver and Herrington, 2000; Squire & Johnson, 2000). The definition involves individuals with common goals, active participation in their community, and decision-making (Liedka, 1999; Collier and Esteban, 1999). In this case, community of practice can be defined as a group of stakeholder interested in the educational development of individuals within their community (Wenger, 1998). This approach brings the stakeholders together to find, discuss, share and offer effective solutions from and for their communities. The ultimate goal is to empower communities through engagement of individuals and groups in social responsibility.

A community of practice is associated with a sense of identity and belonging, membership and common goals. Freire (1994) linked three levels with communities: the development of an identity within a group, share fated and self and collective efficacy toward the goal. A community of practice establishes an effective action and develops strategies for that action. Organizations, individuals and the community share common goals to empower the community as a whole. The proximity of ASTU with the linkages of the main actors and community's ties facilitate the deployment of information. The repeated interaction between the different local groups, easy mechanisms to communicate and deliver training programs and the reputation and desire to offer educational materials to local communities put ASTU in a strategic position to initiate the first attempt to bring together different stakeholders. One of the challenges of COP has been the easy in which COPs can obtain and share useful information in a reproducible manner as well a share local lessons learned internationally with other groups in other languages. The SAWBO system is structured for the sharing of such knowledge across communities, countries and language groups (Bello-Bravo &

Pittendrigh, 2012). Although the Internet has made access to knowledge much easier, its sheer size makes it difficult for local development groups to know about educational materials and systems for sharing educational materials appropriate for low literate learners. Initiating COPs or working with existing COPs to inform them about educational materials useful in their programs, along with drawing upon their experiences to create new educational materials, has the potential to help make useful (and increase the impact) of SAWBO and SAWBO-partner groups created educational materials.

Thus within the context of the SAWBO program, ASTU represents an important central point for the development of a COP or multiple COPs in Ethiopia (Figure 1). Such central “nodes” within a given community or country (Figure 2) will be critical for informing local communities that can use the existing materials as well as beginning the dialogue between partner groups (ASTU, other local partner groups, and SAWBO) to determine best practices of deployment as well as establishing the needs and creation of new educational materials that can be shared. Such COP can then be extended beyond the borders of any one given group, region or country to development COPs across other networks (Figure 3). The goal is to develop networks of COPs across multiple countries that can contribute, share, and use educational materials, appropriate for low literate learners in their own language/dialects, in their local education programs and COP dialogues (Figure 4). Ultimately, the idea is not to impose top-down approaches for sharing of knowledge, but to draw upon the real educational needs of communities and solutions, such that these can be shared globally.

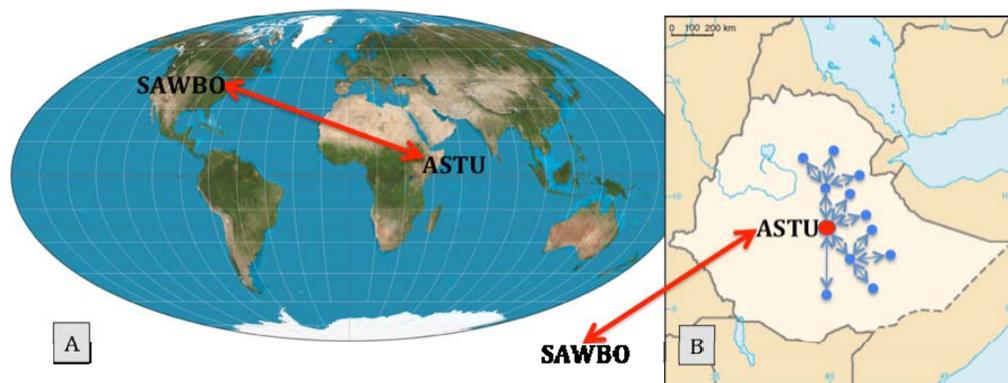


Figure 1: Adama Science and Technology University (ASTU) initiated the developed of a community of practice (COP) network in Ethiopia around (1) the use and deployment of existing Scientific Animations Without Borders (SAWBO)-ASTU created educational animations (in local languages) and (2) determination of the needs for new content. In (A) ASTU and SAWBO have established a working relationship for the creation of the initial educational materials. In (B) ASTU (given as red dot) has taken the initiatives to be the central node in the development of COPs (the blue circle represents a COP) in the Adama region with other local development groups (given as blue dots). Figure of the world and Ethiopia respectively from http://en.wikipedia.org/wiki/File:Mollweide_projection_SW.jpg and <http://en.wikipedia.org/wiki/File:Ethiopia-map-blank.png>.

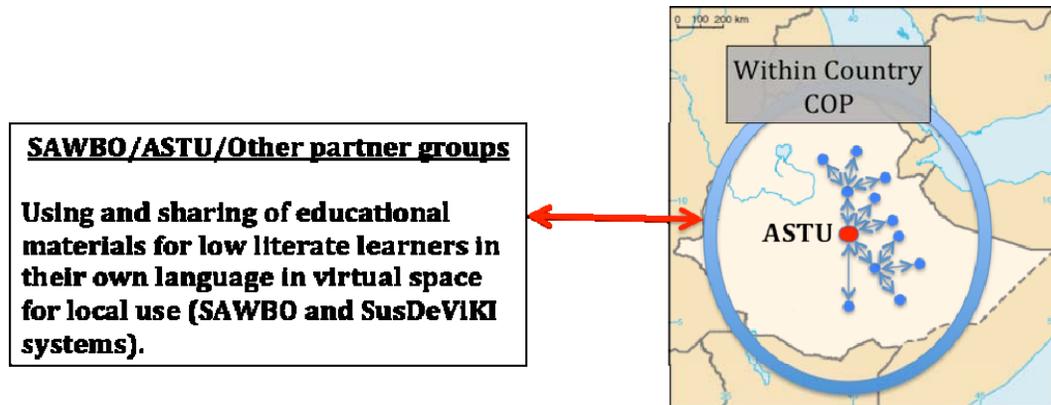


Figure 2: As the groups within the network of Ethiopia are made aware of the Scientific Animations Without Borders (SAWBO)-Adama Science and Technology University (ASTU) educational materials they can access and use these in their educational programs. Additionally, new educational materials, initiated from groups within the COP of practice can be place back into the SAWBO and SusDeViKI (Sustainable Development Virtual Knowledge Interface) systems for further sharing with other groups. Figure of Ethiopia from <http://en.wikipedia.org/wiki/File:Ethiopia-map-blank.png> .

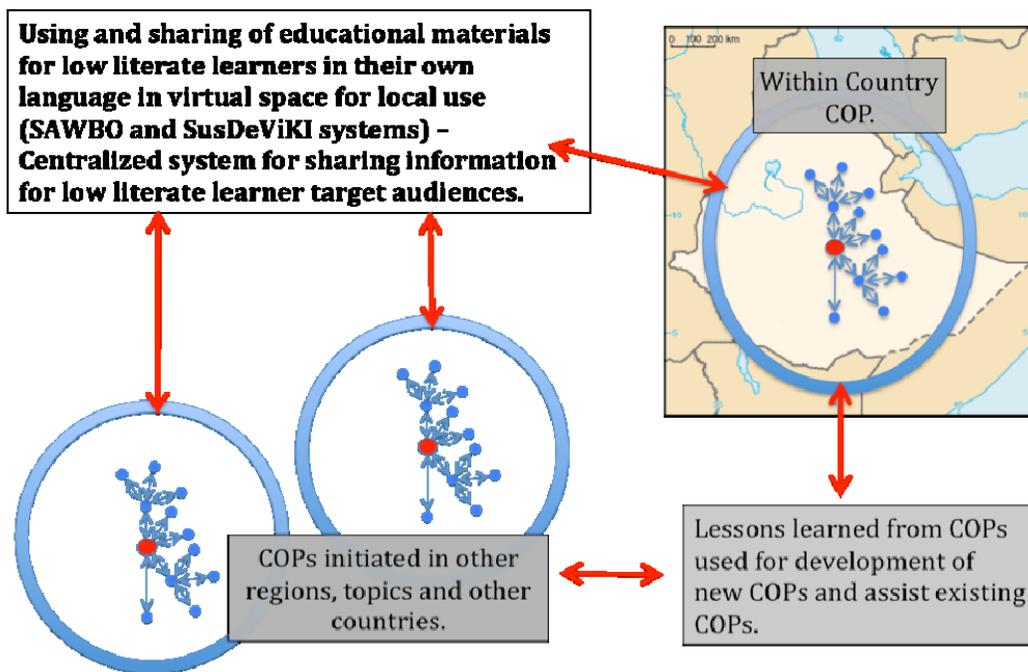


Figure 3: The lessons learned from one series of communities of practice can be replicated in other countries. The red dots represents the initial starting groups that facilitate the development of COPs in the given country and the blue dots represent other groups within the country participate in the COP. The blue circle represents the COP. Figure of Ethiopia from <http://en.wikipedia.org/wiki/File:Ethiopia-map-blank.png>.

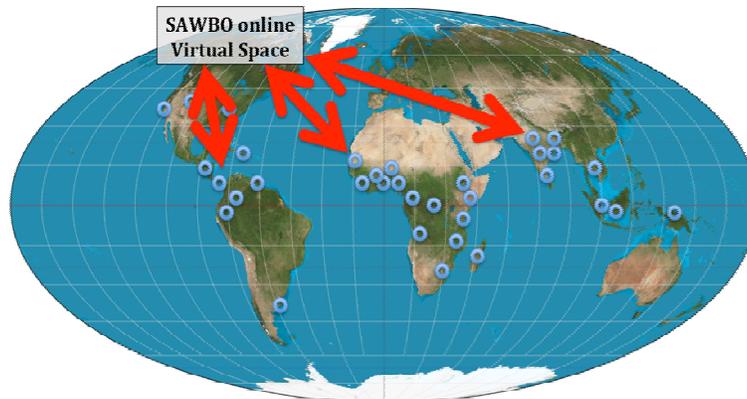


Figure 4: Ultimately communities of practice (COPs) from regions around the world can share educational content, lessons learned for best COP strategies, and the SAWBO system can provide a central framework where new language variants will allow sharing of innovations across COPs in different regions, countries or even continents. Figure of the world from http://en.wikipedia.org/wiki/File:Mollweide_projection_SW.jpg.

3. DEVELOPMENT OF A COMMUNITY OF PRACTICE

3.1. Selection of the Participants Engaged in the Community of Practice

The selection of the participants was organized exclusively by ASTU. Initially, a representative from ASTU identified potential stakeholders from around Adama which included health and agriculture extension agents, agriculture and health bureaus of the local administration, CBOs and NGOs operating around Adama. Consequently, ASTU sent out formal request letters to selected list of stakeholders requesting them to nominate relevant individuals and send them to the planned consultative meeting. Based on this formal request from the university, the bureaus and organizations selected and sent 30 individuals to participate on the consultative meeting. Agriculture and health extension agents who participated on the consultative meeting represented nine Kebeles around Adama (Debibisa Wachu Lafa, Guraja Farda, Merebe Mermersa, Adulala Hate Haroreti, Kuruftu, Wake Mia Tiyo, Kobo Luto, Dabe Dengore, Kechemma).

3.2 Discussion about the Deployment of a Project Entitled “Promotion and Pilot Deployment of Educational Materials for Low-Literate Learners around Adama”

The introduction of the project was done by ASTU in the first meeting with the participants. A representative from ASTU performed a presentation on today’s challenges in accessibility to scientifically validated knowledge to the people in need at the grassroots level. After the presentations some of the animations in local languages were shown to the audience to connect with an open participatory discussion about access to information and availability of educational materials for the target audience. It was demonstrated to the group that educational materials could be easily accessed by downloading from the SAWBO and SusDeViKI sites/systems, and can easily be directly used in deployment programs for low literate learners. The discussion evolved from general ideas about educational materials and deployment to a more specific point of view about the content of the animated videos.

Some of the strengths of the animations reflected on the first consultative meeting between the participants were expressed openly in the discussion. The pictures and voices of the videos were clear, brief, concise, straightforward to the message, and presented in an

attractive manner and attention catching way. An important strength was given to the translation of the materials into local languages that make it easier for the local communities to understand the message of the visuals. This approach avoids language barriers to access information and knowledge that matters most to them. Technology and the opportunity of low literate learners to access technology to get information and knowledge, was one of the topics that extension agents engaged in during the discussion of the consultative meeting. Access to educational materials appropriate for low literate learners in their own local language could bridge the gap that exists between access to information and knowledge for these individuals around Adama. One positive outcome was given to the educational materials being used through the existing national structure for health and agriculture services beyond the pilot deployment.

Limitations of this approach were also discussed in the open discussion among the participants. One of the limitations that they perceived was the scarcity of smart phones among farmers and they recognized that even the farmers that have access to smart phones sometimes they don't know how to use them for watching and sharing videos. Electricity was another major limitation in the deployment of the videos in the Kebeles around Adama. Besides discussing strengths and limitations some suggestions were expressed in the open discussion. One of the suggestions that the majority of extension agents shared was the creation of customize videos to reflect the importance of local cultures, as well they suggested a series of topics for new videos. To this end, SAWBO and ASTU are developing new postharvest loss educational videos useful in the Ethiopian context with localized visuals. The adaptation of the animated videos to local cultures could take place through simple changes such as dress of the characters, music, local objects that can be introduce in the animated videos. Other issues were raised concerning the limitations of the current videos, possible solutions (which can be dealt with due to the flexibility of the animation creation system), and potential needs for new educational materials. Regarding the measuring techniques presented in some of the videos, these are available for both the metric and non-metric measurement systems. Other ideas regarding other topics for future health and agriculture videos were discussed.

The session finished with some tangible outcomes. All the participating stakeholders agreed to participate and support in the pilot deployment of the educational materials in a form of animated videos. A second meeting was scheduled for the training of the extension workers to start the deployment. Lastly, after the pilot deployment, participants agreed to report progress and achievements with the representative of ASTU as well as monitoring and evaluating the mechanisms used in the deployment.

3.3. Outcomes of the Consultative Meeting: Training of the Participants

The training of the extension agents and health workers was based on the outcome of the consultative aforementioned meeting of the project entitled "Promotion and Pilot Deployment of Educational Materials for Low Literate Learners around Adama, Ethiopia". ASTU initiated this community of practice (COP), in collaboration with the program SAWBO, and "Forum on Sustainable Child Empowerment Adama area Program Office" (FSCE). The educational materials in a format of animated videos were created by SAWBO. In the previous consultative meeting the different participants agreed to divide the deployment in different phases: (1) phase one: promotion, (2) phase two: deployment of educational materials, (3) phase three: evaluation of the pilot deployment and (4) phase four: large-scale deployment.

The training was part of the second phase; the deployment of educational materials. It was conducted on January 17, 2013 after the consultative meeting that took place on

December 7, 2012 which involved the decision made on the promotion of the selected educational materials to various stakeholders. The participants were represented from various government offices, NGOs and Community Based Organizations (CBO) in and around the city of Adama. The selected educational materials in a format of animated videos were translated into two major Ethiopian languages and elicited discussion among the participants in the consultative meeting on the nature of the videos and alternative approaches for deployment of the selected animated videos in and around Adama.

Based on the previous consultative meeting some decisions were made about the Kebeles that would be target in the pilot deployment. These Kebeles were: Debibisa Wachu Lafa, Goraja Ferda, Merebe Mermersa, Adulaha Hatte Haroreti and Wake Miya Tiyo. All the healthcare providers and agriculture extension agents from the selected Kebeles were invited to attend the consultative meeting and were informed about the project and the training. All the participants that were in the consultative meeting attended the training as well. The training consisted of making ten selected videos available for distribution in the Afan Oromo and Amharic languages. The content of the selected videos were the following: malaria prevention, bed nets, cholera prevention, oral rehydration solution (ORS), and natural insecticides from neem seeds. These videos were placed in the cell-phones of the extension agents and health care providers and 100 CDs were provided to the extension agents and health care providers for local distribution and deployment.

3.4 Process and Experiences in Selecting Collaborating Participants

Based on results of an initial consultative meeting ASTU decided to conduct the pilot deployment by interacting with five of the nine Kebeles in order to participate in the training sessions. However, regardless of ASTU's selection, the remaining four Kebeles also showed considerable interest in attending the training sessions and participating in the deployment of the videos within their communities. Ultimately, all nine Kebeles participated in this program. A total of 35 health and agriculture extension agents, from these nine Kebeles, attended these training sessions. Our experience with these interactions suggested considerable, and enthusiastic, interest in this program from local Kebeles and a desire for groups to not be left out of an opportunity to gain access to these educational materials.

3.5 Objectives of the Training

The overall objective of the training was to inform the extension agents and health care providers about the existence of the educational materials available in local languages that could be used for their target audiences. The following issues were addressed: to make them aware of the accessibility of the animated videos, how to download these videos into their cell-phones and how to share the videos from cell-phone to cell-phone through Bluetooth® technology. Additionally, we made them aware of the possibility of using other ways of deployment, including using a CD player, a computer or any other type of electronic devices. The specifics of the training was more technical as it related to how the videos could be download directly from the online SAWBO sites onto computers and then from computers onto cell-phones and shared from cell-phones to cell-phones. In the meeting we also develop an action plan for the deployment based on the Kebeles. Lastly, we decided on the different mechanisms used to evaluate the pilot deployment.

3.6 Outcomes from the Training

During the training all the participants viewed all the selected videos in local languages available for the deployment. They learned the technical skills to transfer the videos from computers to cell-phones. They were also learned how to transfer the animated videos from

their cell-phones to other participant's cell-phones through Bluetooth. Additionally, six CDs, containing all the videos, were given out for each Kebele and in each of the CDs contained ten animated videos. The participants decided to target at least two-third of the households in each Kebele. They also decided on their best method of deployment based on their preferences or resources such as computer, cell-phone and other devices. Participants set their deployment action plan for one month after which the third phase (evaluation of the pilot deployment) of the project will begin.

3.7 Targeted Pilot Deployment Mechanism

The extension workers decided to target a total of 3,924 (two-thirds) households during a one-month period of the pilot deployment. The following table shows targeted household size from each Kebele.

Kebele	Number of Household in the Kebele	Number of households selected
Debibisa Wachu Lafa	640	429
Goraja Ferda	682	457
Merebe Mermersa	608	407
Adulala Hatttie Harore	923	618
Wake Miya Tiyo	842	564
Dabe Dengore	242	242*
Kobo Luto	562	376
Wonji Kuruftu	777	512
Kechema	476	319
Total	5752	3924

Table 1: Number of households selected from each Kebele for pilot deployment

* Participants selected all of the households within the Kebele for deployment of the videos.

3.8 Organizing the Community Involving Existing Infrastructure

The previous consultative meeting with private and public institutions and the training meeting with the health care providers and extension agents allowed for the development of the initial steps of a community of practice within the Adama community, developing a network of groups with tangible educational deployment activities. The planned activities included the following. First, show the videos to the community at Farmers Training Centers (FTC) of each Kebele. Second, distribute videos to women and other associations. Third, use of a "one-to-five structure" which already existed in the community. The "one-to-five structure" (development army) is a new national initiative that requires every citizen to be a member on a group containing 5 individuals (students, farmers, civil servants, etc). One of them becomes a leader for the group and joins other four leaders of other similar groups to form another 1-to 5 group. Similarly the structure continues upward to end up connecting all together at some point (Federal level). Third, provide CDs to group that could accommodate this specific form of distribution and use. Fourth, during the pilot deployment, the idea was that each Kebele would hold soil and water conservation campaign on which almost all residents will participate on the occasion for some days. Trainees planned to share the videos to the community during these campaigns especially using cell-phones. Fifth, distribute the

videos to health posts, schools, local film houses, hotels and restaurants within their Kebeles. Sixth, and finally, some of the Kebeles have access to LCD projectors and planned to use them for showing the videos to their community.

These represented (1) a discussion of logical local deployment strategies, as determined the local community, (2) the opportunity to make these local community stakeholders aware of the SAWBO-ASTU educational materials, (3) the online sharing systems (SAWBO and SusDeViKI sites), and (4) the opportunity to begin the process of informing the SAWBO-ASTU team of the needs for the creation of new content and the nature of such content. This “push-pull” knowledge system is intended to inform local groups of available materials for use in educational programs (“push”) in local languages and an approach to inform the SAWBO-ASTU team of the need for new language variants and new educational materials that will be useful locally (“pull”).

4. CONCLUSION

In this study, the approach taken by SAWBO and ASTU to information delivery system and deployment of educational materials was successful. The participation of public and private institutions at the local level and the role of ASTU to connect the different stakeholders have a great potential to enhance the distribution and deployment of SAWBO educational materials, improve access to information for the households of the Kebeles and support development. The effective mobilization and coordination of efforts from ASTU, public, private, NGOs and communities to ensure the deployment of SAWBO animated videos ensure the success of the different phases of the project. The NOGs and CBOs are important development forces in the Kebeles. They are involved in agriculture, health and other rural development activities and SAWBO animations are the right appropriate educational materials for their target audience.

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