

PARTICIPATORY DESIGN AND EVALUATION OF COMMUNICATION MATERIALS ON *MUYONG* AND *TAPAK-TAPAK* SYSTEMS AS INDIGENOUS TECHNOLOGIES FOR NATURAL RESOURCE MANAGEMENT

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ABSTRACT

A participatory design and evaluation of information, education, and communication (IEC) materials on *muyong* and *tapak-tapak* systems as indigenous technologies for natural resource management was conducted among farmers, agricultural technicians, and barangay officials in Amganad and Poblacion, Banaue, Ifugao. The objectives were to determine the attractiveness, acceptability, and comprehensibility of the communication materials and to find out the effects of the participatory design process among the participants. A participatory planning and design workshop was held during which the participants developed the message and designed the communication materials of their choice which included a poster, leaflet, comic story book, and radio script. The participants were engaged in key informant interviews, focus group discussions, interactive exchange of ideas, supervised communication materials design, and validation methods during the participatory design and evaluation process. Self-administered questionnaires were used to measure comprehensibility of the materials.

The IEC materials were found to be attractive, acceptable, and comprehensible. A number of constructive comments and suggestions were elicited from the participants to make the necessary revisions to the text and illustrations in the IEC materials. While the participatory design process contributed to attractiveness, acceptability, and comprehensibility of the materials, it was found that the materials should be location or community specific. The participants found the participatory design process a highly engaging and learning activity. They felt a sense of pride in seeing their ideas transformed into communication materials. Further, a synergy among experts, semi-technical individuals, and community members could be achieved through participatory design and evaluation.

Keywords: Participatory design, evaluation, communication, indigenous technology, natural resource management

INTRODUCTION

Indigenous knowledge systems and technologies deserve a second look. According to Jill Cariño (2009), convenor of the EED Philippine Partners' Task Force for Indigenous Peoples' Rights (EED-TFIP), "indigenous knowledge systems are deemed as backward or brushed aside as insignificant. But for indigenous peoples who use this knowledge, it is a way of life – one that has proven appropriate and sustainable, ensuring their food security and continued survival for generations."

In northern Ifugao province, indigenous farmers continue to practice the '*muyong*' or 'pinugo' and 'payew' or 'payoh' systems (Macandog, 2009). These indigenous farming systems have been handed to them from generation to generation.

The *muyong* is an indigenous forest management system that protects the rice farm terraces from erosion and runoff. Furthermore, the indigenous plants in the *muyong* maintain soil fertility and plant biodiversity. Indigenous plants are native to a specific area of the country (<http://www.abc.net.au/gardening>). A native plant is a plant which is growing in a particular region having arrived naturally, i.e. without human intervention. (<http://uk.answers.yahoo.com>). The *muyong* provides a source of water for rice terraces and low lying communities, hardwood for wood carving, furniture making, and house construction, fibers and dyes for cloth weaving, and food from fruit trees (Macandog et al., 2009).

Payew refers to the irrigated rice terraces of the Ifugaos. The payew system makes use of wild sunflower (*Thithonia diversifolia*) or "*lampaw*" as major organic fertilizer. Before the planting season begins, sunflower or *lampaw* stalks are laid on the seedbed or rice field, then stepped on until they are mixed into the wet, muddy soil where they are left to decompose within one month. This technology is called 'tapak-tapak' system in the vernacular. According to the Ifugao farmers, the decomposed sunflower can loosen and rejuvenate the soil, give the rice plant a vigorous growth, improve rice productivity, improve the size of rice grains, enhance the color of rice leaf, and deter insect pests and giant earthworms (Macandog et al., 2009).

Based on the Ifugao farmers' experience and observation, the *muyong* and payew systems contribute to sustainability of their forest and rice fields. Being environmentally and economically beneficial, these farming systems should be promoted. To be even more useful, indigenous practices should be captured and preserved and passed on from generation to generation. More importantly, information about the *muyong* and payew systems for natural resource management should be shared with other farmers, development managers, stakeholders and policy makers who can benefit from them. Moreover, communication and learning about the *muyong* and payew systems should proceed continuously to add value to these indigenous farming systems.

Communication and Indigenous Knowledge

Communication has often been described as the lifeblood of society or the steering wheel that moves development programs. It involves the continuous exchange of information among

participants until they reach a common understanding. It plays a significant role in natural resource management programs.

Effective communication is one of the factors that lead to the success of sustainable resource management. It creates awareness and mutual understanding about an innovation or technology. It can lead to informed choices and wise decisions about accepting, modifying, or rejecting a technology. It can encourage positive behavior changes in knowledge, attitude, and practice that result in an improved quality of life.

Communication is being used to promote and disseminate indigenous knowledge. It can be used to inform and educate people about indigenous farming technologies. It is a powerful advocacy and social mobilization tool.

Participatory Design and Evaluation

Participation in communication and development is a popular, bottom up approach today. Cornell University (nd) explains that community stakeholders are in the best position to know what their needs are, what resources they have, and in what direction they want to go. Through their involvement in communication and development processes, community stakeholders are empowered to identify their needs and seek their own solutions for a better socio-economic life and a sustainable environment (Wikipedia, 2009).

Participatory communication is a “people-centered” approach to providing relevant information or skills for participants to engage their knowledge and experiences in action-solutions to their problems (Dvaid and Balka (2007) cited White and Patel (1994)). Apparently, participatory approaches build up the skills, interests, and capacities of stakeholders even after the end of the project.

Participatory design includes assessment, design, and development of technological and organizational systems (Computer Professionals for Social Responsibility, 2007). Community stakeholders are involved in identifying and producing communication content and materials (Besette, 2004).

Evaluation is necessary because it helps assess the impact of a communication material, a technology or a development project. Evaluation allows participants to look back and foresee what has been done and to learn from the experience. The more participatory an evaluation activity is, the more likely it will represent the real situation and opinions of stakeholders Cornell University, nd). Participatory evaluation a democratic process that allows for shared learning and joint decision-making among stakeholders and leads to co-ownership, mutual respect, and empowerment (Estrella, 2001).

Pretesting communication materials is a type of formative evaluation that is carried out before the material is mass produced and widely distributed to stakeholders. It enables the researcher to gather the reactions and opinions of stakeholders to a material or medium so that it can be revised and improved for more effective communication.

Research Studies on Participatory Approaches in Development

Controlled irrigation was tested using participatory research and development and was found to be a viable technology among farmers in Tarlac province, Philippines. The farmers perceived that controlled irrigation significantly saved a big amount of water, time, labor, and cash, and also reduced the cost of rice production (Palis et al., 2003).

Early experiments on participatory video tested if the tool can be used to encourage change in attitudes and behavior to solicit the participation of communities in identifying development solutions that are within their reach. Findings showed that residents of a fishing-dependent community were empowered to create a video presentation about the impact of declining fish stocks and policies to help deal with this decline. The participatory video also bridged the gap between policy makers and the affected communities (White, 2003).

In Vancouver, Canada, the community engagement model was used in producing a video to promote awareness about BC Nurseline, a 24-hour telephone health service. The model involved the target-population members in all aspects of the video production. The study concluded that the use of an extensive, culturally engaged process to produce and evaluate the videos is integral to its success. The community engagement model can be used to produce effective, culturally sensitive, participatory media targeted at specific communities (David and Balka, 2007).

The leaf color chart (LCC) as a nitrogen management technology was evaluated using the participatory approach among farmers in West Bengal, India. The farmers assessed the suitability and acceptability of the leaf color chart in their environment. From field trials that they designed and carried out, the farmers found that the leaf color chart reduced the use of pesticides. Furthermore, real-time management of nitrogen with the LCC helped the farmers minimize nitrogen use, reduce the cost of cultivation, decrease pest and disease incidence, minimize chaffy grains, and protect the crop from lodging. Farmers perceived that the use of more nitrogenous fertilizer brought more yield (Bagchi, et al., 2003).

Ortecho (1991) used participatory evaluation to assess the history of a housing cooperative in Argentina. She engaged the members in an activity to draw memorable scenes or remarkable moments in the history of their community and to reflect on these scenes until they reached consensus on eight critical events. Ortecho's participatory evaluation with community groups showed that images and manual work enrich dialogues and lead to holistic thinking.

The main research objective was to document and assess the participatory design process used in developing communication materials on the *muyong* and *tapak-tapak* systems and to evaluate the design of the communication materials using participatory methods.

Specifically, the research objectives were to 1) determine the attractiveness and acceptable of the communication materials produced; 2) determine the comprehensibility of the communication materials through a knowledge test; 3) elicit comments and suggestions for

improvement of the communication materials; and 4) determine the effects of the participatory design process.

METHODOLOGY

This study was a part of the NRCP-funded project entitled “Development of Information System on Lesser-Known Indigenous Plant Species Used in Organic Farming System, Sustainable Indigenous Farming Systems, and Community Health Care and Food Supplements in the Cordilleras, Northern Luzon”. It focused on the design and evaluation of information, education, and communication (IEC) materials on the *muyong* and *tapak-tapak* systems using the participatory approach.

Participatory Planning and Design

The participatory planning and design approach was used in the development and production of prototype IEC materials on *muyong* and *lampaw*. A participatory planning and design workshop was held on April 17-18, 2009 in Banaue, Ifugao. The participants were a mix of 20 farmers, housewives, and high school students. During the workshop, the participants selected their preferred communication materials. After a simple voting, the poster, leaflet, comic story book, and radio spot emerged as their choice of IEC materials.

The workshop was facilitated by a development communication specialist. Focus group discussion, key informant interview, question and answer session, reflection, consensus building, and validation were applied in the participatory design process.

Guided by the facilitator, the participants prepared the text or slogan in English for the poster on the *muyong* (i.e., *Save our Muyong. Save our Lives.*) and use of *lampaw* in the *tapak-tapak* system (i.e., *Use Lampaw to Increase Yield.*). They also developed the text or information about the *muyong* and *tapak-tapak* system that was used in the leaflet. They designed and drew the illustration for the poster about *muyong* and use of *lampaw*. (Please see Figures 1a and 1b for *muyong* poster and Figures 1c and 1d for *lampaw* poster.)

For the comic story book, the community members developed the story plot, identified the characters, and wrote the story in Ifugao dialect. They also described the traditional clothes of the characters that served as basis for the comic book illustration.

The text or information for the leaflet about the *muyong* and *lampaw* were collected from key informant interviews and group discussion with selected community members and validated through the results of previous research studies. The community members narrated the benefits, ownership process, and customary laws of the *muyong*. They also identified the specific steps that they practiced in using wild sunflower or *lampaw* as organic fertilizer for rice. They served as models in the photographs that were taken to demonstrate the use of *lampaw* as fertilizer.

The younger group of community members developed and wrote the scripts for the radio plugs on *muyong* and *lampaw*. The development communication specialist provided them basic tips on radio writing. Two scripts were written in Ifugao language – one as straight announcement and the other as dramatized radio plug.

Execution and Production

The actual execution and production of prototype IEC materials on *muyong* and *lampaw* was done from the first week of May until the third week of August 2009. One of the project team members, who is a professional communication media specialist, executed the original poster designs and also illustrated the comic book stories of the Ifugao community members. Since the radio script was in Ifugao dialect, the voice narration or recording, mixing, and dubbing of the radio plugs was postponed during this period.

The posters were illustrated by the professional communication specialist and artist based on the original design of the Ifugao community members. Figures 2a-3a show the prototype posters that were produced on the *muyong* and *lampaw*.

The stories for comic booklet were written in English by the Ifugao community members (Figure 3a-b). The stories focused on the benefits of the *muyong* and the *lampaw*. The story on the *muyong* is about a farmer's son who misused the forest resources and was taken in by a humanized boar and bird who taught him about the value and benefits of the *muyong*. The story on the *lampaw* focused on a young suitor who is wooing a beautiful lady with various gifts, including the *lampaw*, which the lady accidentally threw in the backyard rice field and yielded good harvest. It ended with the lady finally accepting her suitor and her family using *lampaw* as fertilizer. These stories were translated into Tagalog and then visualized and illustrated by the professional communication media specialist.

A research specialist of the project team wrote in English the text or information for the leaflet on the *muyong* and *lampaw* based on the data collected from the community members during the participatory planning and design workshop. The text was then edited by a communication specialist while the content was validated with the assistance of the project team leader and members. The professional communication media selected photographs taken from the field and laid these out in the leaflet using computer graphics software. The prototype leaflets are shown in Fig. 4a-b.

Testing and Evaluation

The prototype posters, comic story books, and leaflets were pretested and evaluated on August 24-25, 2009 in Banaue, Ifugao. Two groups of respondents participated in the testing and evaluation of the IEC materials. The first group comprised of community members from Amganad, Banau who had participated in the participatory planning and design workshop in April 2009. The participatory testing and evaluation was held underneath one of the native houses in Amganad. The second group was composed of 25 participants – 17 agricultural officers/technicians and barangay officials and 8 farmers from various farmers' associations in

Poblacion, Banaue. The evaluation was held in one of the buildings in the municipal town hall in Poblacion.

A self-administered questionnaire and focus group discussion were used in the testing and evaluation process. In addition, an interactive exchange of ideas and opinions took place among the participants during the testing and evaluation process. The participants shared a lot of their knowledge and clarified information about the *muyong* and *tapak-tapak* systems. Quantitative and qualitative methods were combined in the evaluation of the prototype IEC materials.

RESULTS AND DISCUSSION

Poster Evaluation

Muyong Posters

The message of the two *muyong* posters, which was save *muyong* to save lives, was generally understood and perceived to be intended for Ifugao farmers and their families. The images in the poster were correctly identified and familiar to the respondents. The posters easily caught the respondents' attention, particularly the text and the images. The text was moderately readable at a distance but the font size should be increased for legibility at far viewing distance. The posters were generally acceptable, had no offensive or displeasing elements, and were large enough to be seen at a distance. The posters showed images and scenes that were similar to the original posters that the community members had designed. The posters motivated the respondents to conserve their *muyong*. Overall, the posters were rated excellent because they were simple, attractive, clear and colorful, and communicated a good practice.

Majority of the respondents said they had participated in the planning and design of the *muyong* posters, mainly through group discussion, cooperation, and sharing of ideas. Most of them liked a lot their participation in poster planning and design because they enjoyed it and learned from it. They indicated their willingness to participate in the development and production of IEC materials in the future. According to them, the participatory approach enabled them to: 1) develop communication and closer relationship in the group; 2) help each other contribute to the success of the poster design; and 3) honed their skills in writing and drawing.

Lampaw Posters

All of the respondents got the message in the posters, which was to use *lampaw* to increase rice yield. All of them also thought that the posters were intended for them. The rice bundles, rice plant, rice terraces, and *lampaw* were the most prominent images in the poster. These images were highly familiar to the respondents and served as eye magnets that easily drew their attention to the poster. According to majority of the respondents, the text in the *lampaw* posters was highly legible. Nothing was offensive or displeasing about the *lampaw* posters. In fact, the posters were highly acceptable. The size (183 cm x 76 cm) was large enough to be seen

at a distance. The color, size, and images of the poster were elements that the respondents liked most.

The respondents thought that the posters were moderately similar to the posters that they made during the participatory planning and design. The respondents generally rated the *lampaw* posters excellent because the posters were clear, self-explanatory, and presentable especially to farmers.

Most of the respondents liked the participatory design process and were willing to participate again in helping design a communication material in the future.

Suggestions to Improve Posters

For the *muyong* posters, the respondents suggested to combine the two posters into one poster. They suggested deleting the large tree in the poster showing the benefits of the *muyong*. The tree should either be placed near the house or added to the *muyong*. They would like to see the chicken, carabao, and native house illustrated below the rice terraces to emphasize the benefits of the *muyong*. They also recommended to show a farmer working in the field.

For the *lampaw* posters, the respondents were not happy about the “antique” looking rice bundles. They suggested making the rice bundles look fresh and golden. They also recommended that the field should have canals and weeds. Moreover, the rice panicles should look full. They pointed out that the rice terraces in Amganad are located on lower slopes and are wider while the rice terraces in other barangays were located in steeper slopes, narrower in size, and had stone walls. They also suggested that there should be no or little rice plants in the field when the seedbed has been transplanted with rice seedlings.

Leaflet Evaluation

Muyong Leaflet

The respondents’ scored an average of 8 out of 10 in the knowledge test. This implied high comprehensibility of the *muyong* leaflet among the respondents. The following key points and observations were derived from the focus group discussion on the *muyong* leaflet: 1) the *muyong* is generally located above the rice terraces but it can also be found near the rice terraces; 2) cleaning the *muyong* is an indigenous practice in which seeds that fall on the ground are expected to germinate; 3) inheritance of the *muyong* depends on the number of children – if there are 10 children and the *muyong* is only one hectare, it will be equally distributed among the children, especially for house needs; 4) permission to collect fuel wood in the *muyong* is necessary especially if the person is not part of the clan; 5) scientific research should be conducted on the *muyong* to find out how much of the decomposed *muyong* leaves can give organic fertilizer and to test various kinds of leaves in the *muyong* for the amount of organic fertilizer they can yield; and 6) clearing the *muyong* to claim it as one’s own was not a common practice today; 7) there are two kinds of *muyong* – private property and communal property; and 8) some local terms were misspelled and corrected.

Lampaw Leaflet

The respondents' average score on the knowledge test was 8.7 out of 10 points, indicating high comprehensibility of the leaflet. The following results of the focus group discussion emerged: 1) the leaflet was highly attractive and acceptable; 2) the use of actual photographs to convey the steps or procedure in using *lampaw* as organic fertilizer was highly preferred by the respondents; 3) different experiences were encountered in terms of use of the *lampaw*; and 4) scientific explanations or research results about the use of *lampaw* should be added to the content.

Comic Story Booklet Evaluation

Muyong Comic Story Booklet

All of the respondents scored an average of 8 out of 10 points in the knowledge test, indicating their high comprehension of the story, which they themselves wrote during the participatory planning and design workshop. Generally, the *muyong* story was well received and enjoyed by the respondents. However, the visuals needed to be improved.

The focus group discussion elicited a variety of suggestions for revision of the visuals. To improve the cover, an illustration of a side view of the rice terraces should be shown along with the *muyong* or forest. Besides the logo, the names of the institutions involved in the funding and production of the comic story booklet should be included in the inside cover. Meanwhile, the suggestions for improvement of the visuals in the inside pages of the story booklet consisted of the following: 1) add bolo as part of the traditional attire of the farmers; 2) change the color of the clothes; 3) change the illustration of the house to the traditional or native Ifugao house and draw the house in a flat area, not up in the rice terraces; 4) change the trees near the house to betel nut and banana; 5) make the size of the native wild boar smaller; and 6) include a daughter in the family, instead of having a son only.

Lampaw Comic Story Booklet

Similar to the *muyong* comic story booklet, all of the respondents scored 9 out of 10 in the knowledge test. The respondents, who wrote the story, expressed that they wanted to include the marriage of the two lead characters and celebration of a happy wedding feast at the end of the story.

Suggestions for Comic Storybook

They had several suggestions for improvement of the visuals in the booklet. For the booklet cover, they suggested improving the image of the sun by adding 'glow' to the sun and also improving the image of the rice terraces. The inside cover should also include the names of the institutions responsible for the funding and production of the booklet. The suggestions for the inside pages were: 1) make the warrior-suitor more masculine by adding spear and bolo; 2) change the clothes of the characters to the traditional Ifugao clothing; 3) improve the look of the rice terraces; and 4) add more trees in the setting.

Editing, Recording, and Translation of Radio plugs

Two participants were requested to edit the straight announced and dramatized radio scripts that were written in Ifugao by selected community members in April 2009. One was an agricultural officer and the other was an Ifugao farmer. Both were in their early 40s. These participants also translated the radio scripts into English. They were requested to do the voice recording using the laptop with attached microphone. The recorded voice narration in Ifugao dialect still needs to be mixed with music and sound effects. Since the radio plugs were not yet produced at the time of evaluation, these were not included in the evaluation process.

SUMMARY AND CONCLUSIONS

A workshop was conducted to carry out participatory design of IEC materials among farmers, housewives, and high school students in Amganad, Banaue. Using a combination of key informant interviews, focus group discussion, and supervision, the workshop participants were able to produce two versions each of a poster, leaflet, comic story book, and radio script. Manila paper was used for the poster design. For the leaflet, the participants provided the text and descriptions of the pictures that should be included in the leaflet. Photographs were taken of the *muyong* and participants demonstrating the tapak-tapak system. These photographs were used in the leaflet design. The participants conceptualized the stories for the comic story books and discussed with the facilitator the scenes that they visualized for the comic story book. Two high school students wrote the radio scripts about the *muyong*. The prototype designs of the participants were executed into actual IEC materials by a development communication specialist. From Manila paper, the final poster was printed in tarpaulin. The leaflet was printed in full color on white paper. The comic story book consisted of colored illustrations printed on white paper with 4 x 8 1/2 inch size.

Testing and evaluation results that the IEC materials were attractive and acceptable to the participant-evaluators comprised of farmers, agricultural technicians and officers, and barangay officials. The materials were also comprehensible based on high knowledge scores. However, a lot of Ifugao terms related to the *muyong* and tapak-tapak system were corrected by the participant-evaluators. They also clarified the meanings of the *muyong*. The location and illustration of the payew were also improved upon the recommendations of the participant-evaluators. The illustrations in the comic story books needed revision based on the material and social culture of the Ifugaos.

The participants were pleased and happy about their participation in the design and evaluation of the IEC materials. They realized that they had hidden potentials in communication materials design and production. They also learned a lot from their experience in participatory design and evaluation. They felt proud about their communication outputs and were excited to see their materials displayed and distributed to their fellow farmers.

The IEC materials produced through a participatory planning and design process are likely to be highly understandable, acceptable, and attractive to the participating community.

The materials should be location/community specific (topography, dialect, practice, etc.) since each location is different. The participatory design process is a highly engaging activity for the community. The participants feel a sense of pride seeing that their ideas are transformed into IEC materials. A synergy between the experts, semi-technical staff, and people in the community can be achieved through participatory planning and design process.

LITERATURE CITED

B. Bagchi, M.Z. Abedin, and S.K.T. Nasar. 2003. Farmer participatory evaluation of nitrogen management technology: the case of the leaf color chart in West Bengal, India. Rice is life: Scientific perspectives in the 21st century. Session 13: Farmers' participatory approaches to facilitate adoption of improved technology.

www.irri.org/publications/wrrc/wrrcPDF/session13-02.pdf - 62k

Besette, Guy. 2004. Involving the community: A guide to participatory development communication. Southbound, Canada.

Computer Professionals for Social Responsibility (CPSR). Aug 26, 2007.

<http://cpsr.org/issues/pd/>

Cornell University. (nd). Module 3. Research methods for needs assessment and monitoring and evaluation.

ip.cals.cornell.edu/commdev/documents/module03.doc

Estrella, M. 2001. Learning from change. London: Cromwell Press.

Indigenous Plants. <http://www.abc.net.au/gardening/stories/s1366322.htm>. (Accessed 4 June 2011).

Murphy, David and Ellen Balka. 2007. Communicating health information: The community engagement model for video production. Canadian Journal of Communication. Vol. 32 (3&4).

Ortecho. Cristina Bosio de. 1991. Participatory evaluation for community development. Extension Journal, Inc. Volume 29 (2).

<http://www.joe.org/joe/1991summer/a7.php>

Palis, F.G., M. Hossain, B.A.M. Bouman, P.A.A. Cenas, R.M. Lampayan, A.T. Lactaoen, T.M. Norte, V.R. Vicmudo, and G.T. Castillo. 2003. A farmer participatory approach in the adaptation and adoption of controlled irrigation for saving water: a case study in Canarem, Victoria, Tarlac, Philippines. Rice is life: Scientific perspectives in the 21st century. Session 13: Farmers' participatory approaches to facilitate adoption of improved technology. www.irri.org/publications/wrrc/wrrcPDF/session13-03.pdf - 62k

Step 6: Preparing and pre-testing communication content and materials.
http://www.idrc.ca/en/ev-68314-201-1-DO_TOPIC.html.

White, Shirley A. (Ed). 2003. Participatory Video: Images that Transform and Empower. Thousand Oaks: Sage Publication.

What is the definition of a "native plant"?
<http://uk.answers.yahoo.com/question/index?qid=20110306080039AA45hiY> (Accessed 4 June 2011).

Wikipedia. 20 October 2009. http://en.wikipedia.org/wiki/Participatory_design