

# Impact of the 'My Community' communications intervention on changing human behaviour related to surface water contamination in Loja Province, Ecuador

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## SUMMARY

PCI Media Impact formed a coalition of 13 local organizations in Loja Province, Ecuador, in order to implement a My Community communications intervention to reduce contamination of the local surface drinking water supply. Contamination was caused by sewage from farm animals, deforestation causing soil erosion, and improper disposal of toxic wastes such as batteries. The My Community intervention was tripartite consisting of (1) an entertainment-education radio drama, (2) accompanying radio talk and call-ins, and news programs on local media outlets, and (3) the formation of EcoClubs in local schools. Listenership to the entertainment education radio drama was high (62%) among the target audience, and 100 students joined one of the 7 EcoClubs that were formed. Survey respondents reported substantial improvements in knowledge, attitude and behaviour related to solid waste pollution, including a 26-percentage point increase in respondents who reported that they had recycled their batteries. More than 5,000 batteries were collected in a battery collection drive.

## BACKGROUND

Ecuador is among the poorer countries in Latin America, with an average per capita gross national income of \$8,100 USD, and 13% of its people lived on less than \$2 USD per day in 2010 (Population Reference Bureau 2011). In the communities of Celica and Pindal, average monthly incomes are about \$100 to \$160 USD, earned mainly through agricultural work. This income is insufficient to support a household as the cost of providing basic goods for a four-person household was estimated at \$435 USD in December 2012 (Instituto Nacional de Estadísticas y Censos de Ecuador, 2012). However, households are often comprised of six or more people and have an average of only two income providers. The poor economic situation at the site has historically made environmental concerns a low priority for residents who have had limited resources to address them.

Water quality and water supply are serious environmental issues in Loja Province with negative ramifications for local wildlife, human health, and economies. Most agriculturalists in the Province grow row crops, such as corn, and raise livestock, such as pigs. Native forests are felled to create cropland, and this deforestation increases the rate of surface run-off causing soil erosion and loss of soil productivity. This rapid loss of water also means that the water supply becomes more variable and less reliable. Further, the use of agrochemicals, sewage from farm animals, and improper disposal of solid waste, such as batteries that contain toxic metals, including mercury, have caused contamination of the rivers that provide people with their water supply and fresh fish.

Toxic metals from improperly disposed batteries can leach into surface and ground water. Microorganisms convert elemental mercury to methyl mercury, which is known to bioaccumulate in insects, fish, and fish-eating organisms, including birds and humans (Driscoll *et al.* 2007). Mercury is a powerful neurotoxin that can lead to a wide range of health problems causing harm to the brain, heart, kidneys, lungs and immune system (MedicineNet.com 2012). It is especially important to keep mercury exposure low for pregnant and

nursing women. In wildlife, mercury has been shown to cause adverse behavioural, physiological, and reproductive effects at the individual level and can impact population sizes (Driscoll *et al.* 2007).

According to Fund for the Protection of Water (FONAG 2011), batteries cause high levels of water pollution: 'A mercury battery contaminates 600,000 litres of water (volume consumed by a family in one and a half years). An alkaline battery contaminates 167,000 litres of water. A zinc battery contaminates 12,000 litres of water, and a lithium battery contaminates approximately 3 thousand litres (amount of water consumed by a family in 3 days)'.

PCI Media Impact is a non-governmental organization based in New York that utilizes the entertainment-education strategy, developed by Miguel Sabido in Mexico during the 1970s, to motivate human behaviour and social change related to reproductive health and environmental challenges (PCI Media Impact 2011). The strategy incorporates educational messages within an entertaining media program, such as a radio drama, in order to attract large audiences and then educate and motivate audience members to adopt new or alternative pro-social behaviours (Singhal & Rogers 1999). In PCI Media Impact's application of entertainment education, characters are designed as role models that portray the pro- and anti-social behaviours, and their related consequences, in a direct application of social cognitive theory (Bandura 1994). Audience members are expected to most closely identify with transitional role models who evolve over the course of the drama from anti-social behaviours to ultimately adopt the promoted pro-social behaviours and are then rewarded in the storyline for doing so.

PCI Media Impact's My Community approach incorporates two additional strategies to reinforce the entertainment education programme, (1) interactive talk radio shows in which more didactic information can be disseminated and audience members may call in with questions to be answered by local experts, and (2) a community mobilization component in order to provide audience members with on the ground services and resources that will enable them to actualize their pro-social behavioural intent. This community mobilization removes practical and/or logistical barriers to behaviour change that can

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block an individual's ability to change behaviour. The My Community tripartite approach was first applied by PCI Media Impact in conjunction with their Indian radio drama, Tauru, which was associated with substantive changes in family planning related knowledge, attitudes and behaviours, including large increases in sales of condoms (between 227% and 680%) and contraceptive pills (between 200% and 580%) in participating villages (Singhal 2010).

## ACTION

PCI Media Impact's My Community project was implemented in 8 countries in Latin America from 2005 to 2010. The My Community approach was implemented in a 5-step process (Torres 2008):

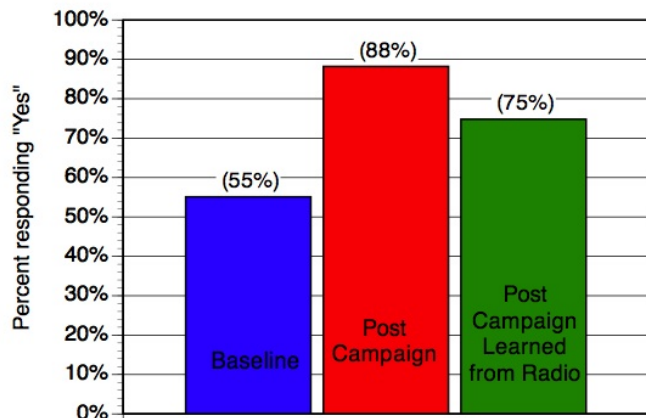
1. *Coalition building*: Applications to form a coalition were solicited through a wide network in Latin America. Coalitions were required to include a service provider, a community radio station, and local, grass-roots organizations.
2. *5-Day intensive training*: Two to three representatives of each coalition received 5 days of training by PCI Media Impact in entertainment education, social marketing, and other communication strategies that included both a classroom component and an experiential learning component in which the participants wrote and produced a 5-7 minute entertainment education, drama.
3. *Project design*: Each coalition prepared a business plan in conjunction with PCI Media Impact consultants, and applied for seed grants of up to \$15,000 USD.
4. *Implementation*: PCI Media Impact assigned a local technical consultant to all successful grant winners, and held local workshops to support the production of the entertainment education drama series by developing a values grid to guide educational issue selection, a character map, dramatic storylines, and other communication components of the project.
5. *Impact evaluation*: Monitoring and impact research was conducted using both qualitative and quantitative data sources.

A total of 62 radio-based campaigns were conducted in Latin America. Each *My Community* intervention promoted pro-social behaviours related to priority issues identified by the coalition. In Loja Province, Ecuador, there were 13 community-based organizations in the coalition, including 7 schools. The lead partner was Radio Integración, and over three years, a total of 180 people received training in communication strategies by PCI Media Impact. Between 2008 and 2010, Radio Integración produced and broadcast a 1-hour long radio magazine *Desafíos* (*Challenges*) twice per week. In each of the three years, 17 to 20 episodes of a radio drama, *Así Somos* (*The Way We Were*) were integrated into *Desafíos* (a total of 57 episodes). The radio magazine also had songs, call-ins, and talk shows that supported the radio drama's educational themes. There was a potential total audience of 40,000 people for the radio programs in the Puyango municipality.

The radio program initially targeted rural communities of Loja Province. In 2009, the plot of *Así Somos* focused on a family struggle that emerges when a son, Felipe, inherits the land belonging to his recently deceased father, Don Rodolfo. Felipe's uncle, Clodomiro, persuades the naïve Felipe to allow him to manage the land with the intention of deforesting it. However, Felipe's girlfriend, Elena, a community leader, challenges Clodomiro to prevent deforestation in order to protect the community's water source. Elena goes to the Environmental Inspector to stop the deforestation, but Clodomiro has bribed the inspector, and so Clodomiro is free to do what he wishes with the land. However, children in the community form an EcoClub to organize the community in support of protecting the land and their water source. The plot evolved to deal with environmental contamination by improperly disposed batteries and encouraged family participation in environmental activities. The EcoClub in the drama organized the recycling of batteries, collection of solid waste, and the promotion of reusing plastic items, providing role models of how this might be done by listeners. In 2010, in the third set of episodes, the drama focus switched to reproductive health issues.

In addition to the radio drama, *My Community* support programs encouraged people to participate in activities through: educational radio spots about caring for the environment, planting trees to reforest deforested areas, recycling batteries, and not throwing waste in the river; promotional radio spots about the EcoClubs, their activities and the plans they were executing; forums for "The Day of the Tree" and "Biodiversity," led by Naturaleza y Cultura Internacional and Departamento de Gestión Ambiental, two coalition partners; the formation of EcoClubs in 7 of the schools that were coalition partners; press articles with information about the project and environmental activities going on in the schools' EcoClubs; and, observation tours with the students of the EcoClubs to learn about the watershed and actions that impacted it.

The entertainment education intervention was evaluated with a pre-post panel survey of residents aged 12 years or older (N = 499; 488); personal interview questionnaires were administered in April and December 2009 in Puyango municipality. A stratified random sample was selected by first randomly selecting three communities (parraquias) within Puyango, and then three blocks (or sectors) within each community were randomly chosen. Houses were selected systematically moving around the block in a consistent direction (e.g. clockwise). One female and one male were randomly selected in each house. The same respondents were re-interviewed in the post survey, and only 11 respondents (2%) were lost between surveys. The samples were approximately 50% male and 50% female. Sixty-two percent of survey respondents reported listening to *Así Somos* in the post survey, and 48% of listeners reported having participated in one of the events organized by *Desafíos*, mostly at their school or in a public plaza or other public space. One-third of respondents reported that they had requested one of the services that were recommended by *Desafíos* (the questionnaire did not ask about which services were requested, but services offered included support for the protection of water resources and materials for planting gardens). Sixty-six percent of listeners reported that they had talked to someone else to recommend something positive that they had learned from *Así Somos*. This is consistent with other findings that the stimulation of interpersonal communication about the educational content of radio dramas is one of the largest effects



**Figure 1.** Response rates to the question whether the respondent knew the consequences of improper disposal of batteries on streams and rivers : baseline, post campaign and percentage of respondents who reported learning about this from the radio.

that may trigger behaviour change (Vaughan & Rogers 2000).

## CONSEQUENCES

In the post survey, 96% of listeners correctly identified environmental conservation as the main educational theme of the radio drama. There were strong gains in knowledge, attitude and behaviour reported between the pre- and post-intervention surveys. These included the percent of respondents who were aware of the recycling campaign for batteries and plastics increased from 14% to 71%, and 72% of aware respondents reported learning this from the *My Community* intervention; the percent of respondents who were aware of the negative impact on rivers and streams of improper disposal of batteries and plastic bags increased from 55% to 88%, and 75% of aware respondents reported learning this from the *My Community* intervention (Figure 1); the percent of respondents who were willing to participate in the collection of used batteries increased from 70% to 85%, and 79% of willing respondents attributed this willingness to the *My Community* intervention; the percent of survey respondents who reported recycling batteries increased from 27% to 53%, and 52% of recycling respondents attributed this behaviour to the *My Community* intervention; and, the percent of survey respondents who reported reusing plastic bottles/bags increased from 34% to 75%, and 57% of reusing respondents attributed this behaviour to the *My Community* intervention.

Over 100 students joined one of the 7 EcoClubs that had formed by 2009 to actively promote natural resource conservation. The clubs ran a battery collection campaign (mingas), which collected over 5,000 batteries (Figure 2). The clubs also promoted the free services offered by the Department of Environmental Management, and worked with the municipality of Puyango to donate and distribute trash cans for household waste disposal. The EcoClubs provided a forum within which youth could take action in support of their new desires to protect their local river and their water source from contamination.

*My Community* generated a lot of support from opinion leaders in the province, as this quote suggests: 'As a school authority, it is our mission to make spaces such as in the radio station available to students where they can interact with other students to talk about issues such as ecology or sexual health.



**Figure 2.** Children participate in the battery collection campaign. (Photo: Lindsey Wahlstrom).

The radio programs also generated a large number of calls supporting the environmental work. Two examples are given below:

*'The radio drama has allowed us to create awareness in those of us who live in this community of Carrizal. Here we have a river basin in which all types of solid waste and trash are thrown and it doesn't matter to anyone. As we heard on the radio what happened in Pampa Pelada because of throwing garbage, here we told people to listen to the programme and now we see that the pollution is under control because the people that live downstream use this water and we can't pollute it.'* [Víctor Guillín, Resident of Carrizal in a call to the radio station].

*'In Vicentino there are lots of pig farms and all of the waste goes into the Rabiya basin. This basin starts in Vicentino and goes through Arenal and arrives at the Puyango River and pollutes all of these sectors. Because there was an EcoClub here and with the help of the radio, they spoke to the authorities to control this pollution. They obligated them to not build pig farms near the basin and those that are there should build septic tanks or they faced a fine and their animals were taken away.'* [María Rojas, Resident of Vicentino in a call to the radio station].

Some community members failed to support the environmental initiatives that were first identified for the *My Community* program in Ecuador because they felt the economic circumstances of local people should be the development priority. However, linking the environmental concerns to

health and water supply challenges helped to alleviate some of these concerns.

The entertainment education strategy has been implemented by many organizations around the world, primarily to promote public and reproductive health initiatives. Many impact studies have found it to have positive and substantive impacts on behaviour change (Rogers *et al.* 1999). PCI Media Impact's *My Community* approach integrates the entertainment education strategy with more didactic informational programming and on-the-ground community mobilization to support and reinforce the entertainment education component in a tripartite intervention. We show here that it is a viable strategy to address environmental concerns as well as public health concerns.

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## REFERENCES

- Bandura, A. (1994) Social cognitive theory of mass communication. Pages 1-90 in Bryant, J. & Zillman, D. (eds.) *Media Effects: Advances in Theory and Research*. Lawrence Erlbaum Associates, Mahwah, NJ.
- Driscoll, C.T., Han, Y., Chen, C.Y., Evers, D.C., Lambert, K.F., Holsen, T.M., Kamman, N.C. & Munson, R.K. (2007) Mercury contamination in forest and freshwater ecosystems in the northeastern United States. *BioScience*, **57**, 17-28.
- FONAG (2011) Fund for the Protection of Water – FONAG, ¡Ponte pilas ...a recolectar pilas usadas! (*Get with it...collect your used batteries*) <http://www.fonag.org.ec/portal/lang-en/noticias/4-noticias/56-campana-i-ponte-pilas-a-recolectar-pilas-usadas.html> (accessed 21 May 2012).
- Instituto Nacional de Estadísticas y Censos de Ecuador (2012) <http://www.ecuadorencifras.com/cifras-inec/canastaFamiliar.html#tpi=348> (accessed 21 May 2012).
- MedicineNet.com (2012) [http://www.medicinenet.com/mercury\\_poisoning/article.htm](http://www.medicinenet.com/mercury_poisoning/article.htm) (accessed 21 May 2012).
- PCI Media Impact (2011) [http://mediainpact.org/?page\\_id=160](http://mediainpact.org/?page_id=160). (accessed 21 May 2012).
- Population Reference Bureau (2011) <http://www.prb.org/DataFinder/Geography/Data.aspx?loc=347>. (accessed 21 May 2012).
- Rogers, E.M., Vaughan, P.W., Swalehe, R.M.A., Rao, N. Svenkerud, P. & Sood, S. (1999) Effects of an

- entertainment-education radio drama on family planning behaviour in Tanzania. *Studies in Family Planning* **30**, 193-211.
- Singhal, A. & Rogers, E.M. (1999) *Entertainment-Education: A Communication Strategy for Social Change*. Lawrence Erlbaum Associates, Mahwah, NJ.
- Singhal, A. (2010) *Riding High on Tauru Fever: Entertainment-Education Broadcasts, Ground mobilization, and Service Delivery in Rural India*. Entertainment-Education and Social Change Wisdom Series, 2010. Oxfam Novib, Den Haag, The Netherlands.
- Torres, S.C. (2008) *Ke Ondas Con Tu Vida (What's up with your Life): A monitoring and evaluation case study*. MA Capstone paper submitted to the School for International Training, Brattleboro, VT.
- Vaughan, P.W. & Rogers, E.M. (2000) A staged model of communication effect: Evidence from an entertainment-education radio soap opera in Tanzania. *Journal of Health Communication* **5**, 203-227.