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## Scientific Animations Without Borders and Crowd-sourced Emergency Relief Knowledge in Local Languages

A Case Study of the Iranian Earthquake

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# Scientific Animations Without Borders and Crowd-sourced Emergency Relief Knowledge in Local Languages: A Case Study of the Iranian Earthquake

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*Abstract: Scientific Animations Without Borders (SAWBO) is a University of Illinois at Urbana-Champaign-based program focused on the development and deployment of educational content that can be rapidly translated and voice overlaid into new languages and deployed through cell phones and other video-capable devices. SAWBO relies on volunteers for translation and deployment of content both online and offline. On August 11 of 2012, a 6.4 magnitude earthquake struck East Azerbaijan province of Iran. SAWBO was contacted by, and worked with, Iranian expatriates from Vancouver, Canada, interested in gaining knowledge, about how to treat water to prevent cholera, into the zone hardest hit by the earthquake. In this case study, we outlined the challenges of deployment of educational content into a country where the authorities restrict the flow of knowledge to their own populations (i.e. a minority language group). We also discuss certain ethical dilemmas related to tracking content and user activities.*

*Keywords: Natural Disasters, Iran, Cholera Prevention, Social Media, Animations*

## Introduction

We now truly live in the “Global Village” first predicted by Marshall McLuhan in his 1962 landmark book *The Gutenberg Galaxy: The Making of Typographic Man*. However, in the past two decades, there has been a massive shift in the way we can create knowledge and share this information. We live in a world where there exists a digital divide in many, if not most, countries, with different social and economic groups having varying levels of access to such digital information. Other barriers include language, and literacy, as well as the politics and economics of making other important knowledge accessible and indicating the groups to which this knowledge is made accessible. One can raise important questions about who should and can be involved in knowledge creation and how this impacts traditional institutional information deployment structures? Additionally, it is important to understand what type of control do these organizations have over target audiences who can benefit from that knowledge? For example, the development of educational content for extension and outreach purposes has often been the prerogative of local, regional or national government agencies. In many countries there is at least an attempt, or the acknowledged need, to make educational materials available to both the majority and minority language groups, where resources and opportunities exist to do so.

However, one might ponder what happens in situations where the local, regional or national governments are not supportive of a given language group? This lack of support may be due to limitations in resources, or due to political agendas that do not support these minority language groups. There is the question of what happens when a major catastrophe occurs and the local authorities are unable or unwilling to respond to these events? What type of reactions might arise if such materials are created and delivered through neutral third party groups that are removed from local, regional or national political agenda? In many developed and developing countries these questions may appear to be esoteric academic questions – however, there are many

countries where these questions and the answers to these questions have serious implications for knowledge sharing.

One can move from these important aforementioned questions, about public institutions that co-ordinate and facilitate aid in catastrophic situations, to the issue of expatriates (private individuals) who are willing to play an active role in responses to a catastrophic event in their home countries despite geographical constraints. In some cases, conventional channels of support (i.e. financial aid and donated goods) might not be available or due to certain political and social complications, not considered as the preferred method of help by expatriates. In some cases, critical information and knowledge might hold a greater value than financial assistance, especially for survivors who are facing immediate challenges in the early stages of a disaster. For instance, when a natural disaster occurs, there are often simple educational steps not commonly known to even highly literate people regarding the challenges they now face where basic services are no longer available. A classic example is that people across many developed nations take for granted safe and clean drinking water from their tap – a service they may temporarily lose during a catastrophic situation. Not knowing how to respond to this possibly rapidly changing challenge, and lacking access to the knowledge of how to treat their water supply, people can contract water borne diseases, such as cholera.

Scientific Animations Without Borders (SAWBO) is a University of Illinois at Urbana Champaign program that focused on the creation of educational content appropriate for people of all literacy levels and in their own languages (Bello-Bravo et al. 2011; Bello-Bravo and Pittendrigh 2012). The SAWBO team has the capacity to both create animated educational content and to work with groups from around the world to place this educational content into a diversity of local languages and accents. Once the content is created, it is placed in a diversity of systems given freely out to anyone in the world that wants to use it for educational purposes (Bello-Bravo and Baoua, 2012, Bello-Bravo et al. 2013a). SAWBO has continually worked with groups that deploy and use these animations in educational programs when and where these outside groups deem appropriate, including circumstances where natural disasters have occurred. Fundamentally, SAWBO's model is to be a neutral third party, such that others can deploy educational content into regions and cultural and language groups that have been overlooked or even persecuted by their governments (Bello-Bravo et al. 2013b, 2013c).

We present a case study from two very different perspectives: (1) a third-person summarized version of the case details and tangible account of events and (2) a personalized comparative story of an expatriate who had experienced three different earthquakes over a span of 23 years. Using this time frame, he explains how social media, crowdsourcing and digitally available educational content from Scientific Animations Without Borders has fundamentally changed his experience during these natural disasters. Finally, we address the ethics of the tradeoff between the desires of academics (and the demands of the academic community) to collect data of “in the field impact” and the critical and moral need not to collect such data. The outcomes suggest tremendous potential, and challenges that need to be addressed, for crowd-sourced survival-knowledge-deployment into natural disaster zones – especially to minority language groups not supported by local, regional, or national government systems.

## **The SAWBO-Iranian Case Study**

### ***The Natural Disaster***

On August 11, 2012, a 6.4 magnitude earthquake hit several cities in the province of East Azerbaijan, Iran. Lack of clean drinking water in such catastrophes can lead to cholera outbreaks. SAWBO was contacted by, and worked with, Iranian expatriates interested in gaining knowledge, on how to treat water, into the zone hardest hit by the earthquake. The use of social media in disaster situations is not new and was used in Haiti in 2010 in order to help respond to

challenges that occurred in that country's post-earthquake (Yates and Paquette 2011) condition. However, this case had specific challenges within the recent historical events in Iran.

### ***The Pertinent Historical and Political Background Preceding the Earthquake***

Being a hostile nation under the pressure of external economic sanctions and still affected by the 2009 post-election turmoil, the Iranian government did not hold a positive regard towards West (Addis 2009). Expatriates' online activity on social networks is generally labeled suspicious and might be subjected to strict censorship by the local government independent of the nature of the activity (Sreberny and Khiabany 2010). Several political and non-political activists were imprisoned as spies and traitors for a simple interview with a foreign media or in some cases, for providing generic health and hygiene information to the general public. For example, Dr. Kamiar Alaei and Dr. Arash Alaei, two top tier HIV/AIDS researchers, were detained in Tehran's notorious Evin prison from June 2008 through Dec 2010 and August 2011, respectively (The Guardian, August 2, 2011). They were charged with "communication with an enemy government", "conspiracy and seeking to overthrow the Iranian government with aid from CIA, US government and State Department" under article 508 of Iran's Islamic Penal Code. This happened because these researchers had shared their scientific results from their "Global Health in Middle East and Central Asia" program (which they established) at an international conference (Shetty 2011).

The "Green Movement" that started after Iran's 2009 controversial presidential election, began in East Azerbaijan and was brutally suppressed by President Ahmadinejad's supporters (Rezai 2013). The opposition candidate, Mr. Mir-Hossein Mousavi, who was believed to have won the election, is originally from Azerbaijan and speaks Azeri. It was the unofficial policy of the Islamic Republic of Iran to suppress local languages and prevent schools from teaching those languages to the minorities (European Parliament Resolution, June 14, 2012). This policy was enforced harshly in East and West Azerbaijan provinces where people speak Azeri and are known historically as having politically active ethnic groups in the nation. The blanket suspicion of the Iranian regime towards the West coupled with the historical attitude of the central government towards Azeri people, made our efforts to help people in the earthquake zone challenging and – one might even say- dangerous, given potential consequences.

### **How Scientific Animations Without Borders (SAWBO) works**

The core of the SAWBO team consists of UIUC faculty and staff, along with both UIUC students and international visiting students and scholars. SAWBO has received academic funding and private donations to accomplish its mission; create educational content related to health, agriculture and women empowerment in local languages. However, all government funding has been strictly for environmentally-benign insect control practices and how to prevent post-harvest losses of grain. The SAWBO program, for its basic operations, relies mainly on an endowment given by a private donor for an academic chair position for the current SAWBO director. SAWBO has never been approached by a government official, of any country, for any form of politically-motivated development or deployment of educational content. All materials are created and distributed free of charge. Once released SAWBO does not track animations in any way after they have been downloaded from SAWBO's sharing systems. Only downloaded numbers from SAWBOs online sites and YouTube @views and likes/dislikes are available to the SAWBO team. Thus, it is important to note that SAWBO, as much as is feasibly possible, attempts to remain a neutral third party in making important information and knowledge available to groups around the world.

In 2010, prior to its official launch, SAWBO created a video specific for the prevention of cholera. The animation had been available in multiple languages, but not in any language specific for Iran prior to the 2012 Azerbaijan earthquake. When contacted by outside groups, SAWBO

works virtually with individuals who (fluently) speak languages that can be added to SAWBO's growing library (available to the world) of animations in different languages. Relying strictly on volunteers, it is a goal of SAWBO to get all animations in as many languages as possible. SAWBO has and continues to welcome all languages and accent variants of their animations, where volunteers, time and resources permit. It is within this context that cholera language variants in Azeri and Farsi were created – by relying on volunteer expatriates from Iran.

### **Timeline of Events and Online/Offline Statistics**

On August 11, 2012, a 6.4 magnitude earthquake shook the Iranian province of East Azerbaijan (Figure 1); more than 300 people died and 3000 more were estimated to be injured (Press TV 2012). On August 14, an Iranian expatriate, living in Vancouver Canada, contacted SAWBO regarding the cholera animation. On August 16 SAWBO posted the Farsi version of the animation on YouTube®, along with links back to the SusDeViKI pages containing the cell phone usable versions of the animation. A second version in Azeri was created and released on August 21 (with the posting YouTube® on August 24, 2012). The expatriate and his friends posted the links on multiple Facebook® pages and emailed the file to several Iranian activists around the globe. The link was also posted on Twitter® and appeared on the famous news portal of Iranians outside of Iran (Balatarin). In September 2012, the Iranian government blocked the video link on YouTube® so Iranians inside the country could not see the content. The expatriate informed SAWBO that the animations were censored; yet he managed to send the mobile version of the video to Iran via travelers who were visiting Iran during the months of September and October 2012. The idea was to bring the animations inside and disseminate them via Bluetooth in public places. In Tehran, the animations found their way to a popular portal that distribute political jokes and satire as well as useful information (identity of the portal is protected due to obvious risks for its administrators). From September 2012 to January 2013, more than 10,000 people downloaded the animations from the SMS portal in Iran; each could have potentially sent the animations to many more recipients.

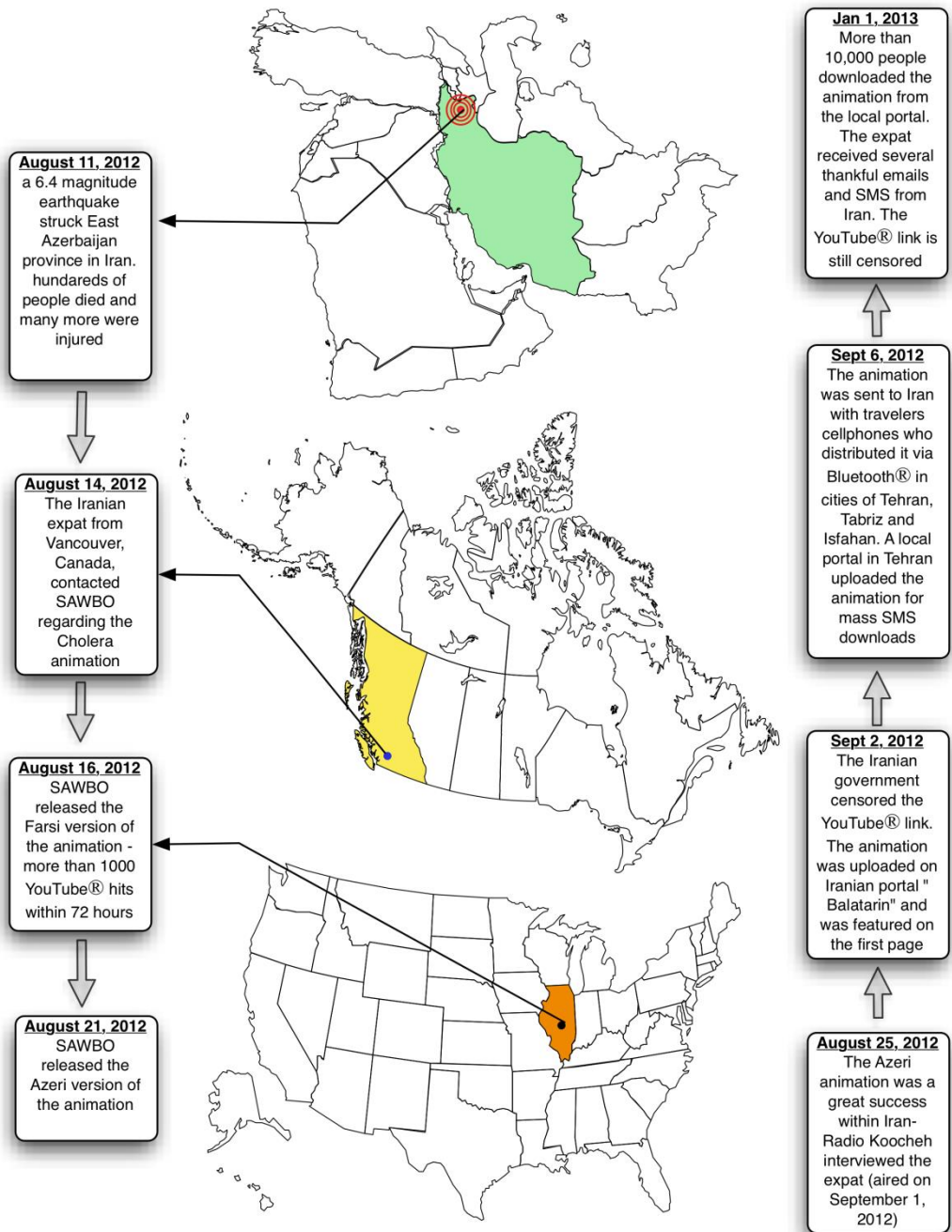
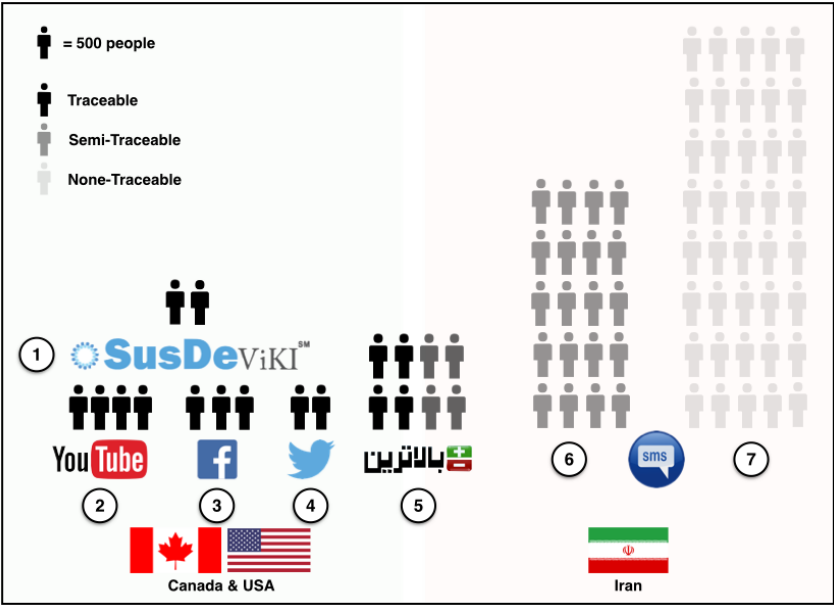


Figure 1 Timeline of events, pre- and post-release, of the SAWBO cholera animations in Farsi and Azeri

### *Online and Offline Mechanisms by which the Animations were viewed both through Tractable and Non-Tractable Systems*

As given in Figure 2, more than 500 people directly viewed or downloaded the Azeri animation from the original SAWBO website via SusDeviKI portal and another approximately 500 people viewed or downloaded the Farsi animation. The Farsi and Azeri animations had more than 2000

visits on YouTube®, mostly from outside Iran as the government censored the website. More than 1500 people shared the link or the video on Facebook® mostly using Farsi or Azeri descriptions. Close to 1000 people used Twitter® to share the link and refer people to the source. Using one of the most popular Iranian news portals, Balatarin, more than 4000 people viewed the link and re-posted the material, which led to initial interviews with Iranian radio stations outside Iran. The video was sent to Iran via travelers and our contacts uploaded the video on a SMS generating portal inside Iran. According to our contacts, more than 10,000 people downloaded the mobile version of the animation from the portal within a period of two to three months. We do not know how many people received the animations as SMS/Bluetooth® inside Iran, as it is a common practice for people to share satirical and political jokes, critical information and pictures and videos, via Bluetooth®, in public places such as subways and busses to an unknown number of recipients.



(1) More than 500 people directly viewed or downloaded the Azeri animation from the original SAWBO website via SusDeviKI portal and another approximately 500 people viewed or downloaded the Farsi animation. (2) The Farsi and Azeri animations had more than 2000 visits on YouTube®, mostly from outside of Iran as the government censored the website. (3) More than 1500 people shared the link or the video on Facebook® mostly using Farsi or Azeri description. (4) Close to 1000 people used Twitter® to share the link and refer people to the source. (5) On the most popular Iranian news portal, Balatarin, more than 4000 people viewed the link and re-posted the material, which led to initial interviews with Iranian radio stations outside Iran. (6) The video was sent to Iran via travelers and our contacts uploaded the video on a SMS generating portal inside Iran. According to our contacts, more than 10,000 people downloaded the mobile version of the clip from the portal within a period of two months. (7) We do not know how many people received the clip as SMS inside Iran as it is a common practice for people to share satirical and political jokes, critical information and pictures and videos via Bluetooth, in public places such as subways and busses to an unknown number of recipients.



## First Person Expatriate Comparison of Three Earthquake Events in Iran

With the lead author speaking in the first person for an informant, we now outline in the following section of three very different personal experiences of earthquakes in Iran using contrasting events, personal observations, and the relationship of the informant to his home country as an expatriate. The lead author uses the final example of how the informant was able to interact with Iran, through collaborations with the SAWBO team, in spite of physical separation with his home country and within the context of the political situation in Iran.

### *Majil and Rudbar Earthquake in 1990 – First Within Iranian Experience*

I was only twelve years old when I first experienced an actual earthquake. It was a hot summer night in 1990. I was already in bed. It was almost a half hour past midnight. I woke up to a rumbling noise and felt my bed is shaking. In the dark, I saw the chandelier in the hallway from my bedroom, spinning violently. Next I saw my parents rush into our room, wake us up and drag us out, half-a-sleep, half-clothed. We found out the morning after that there was an earthquake in Manjil and Rudbar, in Northern Iran. We called “FR”, my mom’s niece (initials are given and have been changed from their real initials so that people cannot be identified) first thing in the morning, as we knew no one else but “AR”, her husband, from that region. She didn’t know much as “AR” had left earlier in the morning to check on his parents and family members. When he came back three days later, we learned the depth of the disaster; the earthquake had ruined his entire village. From his large family of 400, only two people were found alive in the rubble and ruins. Survivors were an 80 years old uncle who later passed away in the hospital due to severe injuries, and a toddler whom they later on adopted as their own. This man’s life was turned upside down in less than two minutes. That night, 700 villages were destroyed. More than 30,000 people died, close to 60,000 were injured and more than 500,000 became homeless.

In less than 48 hours, people started to form volunteer search and rescue groups to help the casualties. Athletes and movie stars went around major cities to gather donations: money, food and clothes. There was outpouring of sympathy and humanitarian support from countries all over the world, as it is usually the case during natural disasters. I was in awe of the public will to help each other. It was an enactment of Saddi’s famous poem:

Human beings are members of a whole,  
In creation of one essence and soul.  
If one member is afflicted with pain,  
Other members uneasy will remain.  
If you've no sympathy for human pain,  
The name of human you cannot retain!

It was a surreal experience for me who, up to that point, was only exposed to war, violence and fear. The movement to help each other was slowly restoring my faith in humanity. Then I was introduced to the concept of organized corruption! I was in middle school and during recess, my good friend asked me to follow him back into the classroom. I watched my friend as he cautiously pulled a half-eaten brick of Swiss Chocolate out of his bag and offered me a small piece. I have never had a Swiss chocolate before, or any foreign chocolate for that matter. Following his instructions, I let it melt in my mouth so I could cherish the rich flavor of hazelnut and dark cocoa. There and then, I was sure I would never experience anything like this in my life again. He said his father bought this in the Bazaar the other day and I must keep this a secret. I asked him if he could lend me the chocolate wrapping paper so I can show it to my sisters. He was hesitant at first but then he agreed. Back at home, my mom saw the wrapper in my bag and she managed to read the hand written note on it: “For Iranian Children in Manjil—Much Love,

Martin”. It was a gift from a Swiss donor and meant to bring temporary joy to an earthquake survivor in Manjil, yet it ended up in Tehran’s Bazaar! We all felt horrible—me the most. AR later on told us that most of the donations, especially those from foreign countries never made it to the people in need. A few months later, we could spot American flashlights, German winter jackets, Swiss chocolates, Dutch condensed milk, camping tents and many other products in every shop in Tehran. Some things still had the Red Cross sticker on them! I felt betrayed. I could not be sure that the food, clothes and money that we donated through the help center actually made it to those that needed it.

### ***Bam Earthquake in 2003 - Second within Iran Experience***

My second experience with an earthquake was thirteen years later in 2003, while I was preparing to leave the country for good and start my new life in Canada. Several times, I had visited Kerman, Bam and Jiroft as a child. My father had a good friend who lived in Bam, and he owned a big orchard populated mostly with citrus plants and date palms. “Mr. MH”, had three sons and a daughter and we all used to have lots of fun running around orchards or playing hide and seek in the world famous Bam Citadel every time we visited the town.

The news came to us as a shock. “Mr. MH”, his wife and the younger son and daughter all died in the earthquake. The older son, “MRZ”, lost his wife and his newborn baby. The middle son, “R”, was in college out of town when the earthquake happened, and it was he who reached us with the tragic news. He moved back to help his older brother, who was badly injured. A few weeks later, when “R” came back to his university dormitory, we managed to get a glimpse of the tragic event and the ensuing chaos. More than 50,000 people lost their lives in that earthquake, and more than 30,000 were injured. Bam Citadel was demolished by the quake and close to 100,000 people became homeless. According to “R”, the first couple of weeks after the earthquake were extremely harsh. The very cold nights killed several people who survived the earthquake. People stole food and supplies from local markets to the point that police had to open fire to deter the looters. People had to stand in long lines for a small ration of water and food, while the extraction teams were still working through the rubble and pulling out bodies. Many survivors become sick after consuming bad water and spoiled food. Help was coming but it was not well organized.

The emergency teams were very effective in search and rescue missions, and they did a phenomenal job of extracting very few live survivors out of the rubble. However, when it came to treating other survivors who were not critically injured, language barriers caused a significant hurdle. According to “R”, there was little to no help for common illnesses such as diarrhea, food poisoning and flu, and there was no source of information for people to prevent and treat those sicknesses. There was an outbreak of cholera after the earthquake in the region. Lack of knowledge, organization and proper infrastructure claimed the lives of many survivors.

### ***Azerbaijan - 2012 – Third Earthquake Experienced as an Expatriate***

I was in Vancouver, Canada when I learned about the earthquake in Azerbaijan. The news spread rather rapidly thanks to the social media, smartphones and the power of Internet, which had had limited availability 10 years ago. Despite great interest of international community to help the victims, the Iranian government blocked access of first responders to the ground zero of the earthquake for several days and even arrested a locally formed rescue team who simply wanted to help their compatriots. The government did not want anyone but the official government agents to be involved in the rescue process in order to conceal evidence of negligence, decades of mismanagement and lack of proper attention to infrastructure. I wanted to help. I knew from my previous experiences that I could not trust official help centers and I had no way of providing physical assistance from Vancouver, B.C., thousands of miles away. So I turned to SAWBO for help.

My collaboration with SAWBO started in 2010 with an animation that we made together on the benefits of natural botanical pesticides. The audience of that animation consisted mostly of North American consumers and it was very well received. The second animation was on preparing botanical pesticides using Neem tree seeds, which I translated to Farsi. At the time, SAWBO had an animation on simple methods of treating water to prevent cholera. I remembered from my conversations with my friend R, after the Bam earthquake, that a cholera outbreak is one of the major concerns in areas that are affected by earthquake.

I saw this as a great opportunity to do something potentially helpful and meaningful to help the survivors, so I translated the animation to Farsi and SAWBO staff went above and beyond to help me with the animation given the time sensitivity. We managed to release the Farsi version of the animation a few days after the earthquake. The animation was what one could consider a success; several groups as well as news outlets from inside and outside of Iran contacted us. Given the fact that most people in Azerbaijan region, speak Azeri and have little to no knowledge of Farsi, with help of a friend of mine in Vancouver, we translated the animation to Azeri and SAWBO released the Azeri version of the animation immediately.

This was a great effort but soon we faced a huge problem. The government of Iran censored YouTube® and Facebook® and limited citizens' access to the SAWBO website. Thus it was almost impossible for people inside Iran to see and use this material. We had to improvise and we had to do it fast, as the clock was ticking and the condition of people in the affected areas was worsening. SAWBO quickly produced a mobile version of the animation that people could watch on their cellphones. I emailed the animation to several friends who were living in Iran and also loaded the animation on the cellphones of several friends who were traveling to Iran, to check on affected family and friends. I asked them all to send out the animation to as many people as they could via SMS and Bluetooth®, hoping that it might eventually get into the hands of people who could benefit from this simple informative short animation. A friend in Tehran put the animation on a local portal, from which people usually download humorous material that they then share via cellphones. She told me that in less than a few weeks, more than ten thousand people downloaded the animation.

Soon after, I started to receive several emails and text messages from people in Iran, especially in Azerbaijan, whom I did not know, thanking SAWBO and myself for the animations. They specifically found the simple remedy for cleaning water using four drops of bleach very helpful. Apparently that was all they had access to at the time. The most notable comment, which I received from several sources, was related to the Azeri animation. People recognized that the accent of the voice over is different from the typical accent of the local people and they took note of the fact that this animation was put together with the help of people in Canada and the United States. It was customary for the local government to downplay the assistance which the international community provides, in order to maintain hatred towards the West. People therefore were shocked and extremely thankful to see that there are American and Canadian citizens who put the time and efforts to help them in a time of need. The animation that was meant to teach distressed people how to clean their water also had some wonderful and positive social side effects.

For the first time, I felt I could do something useful as an individual and see the positive impact of my good deeds. Each thankful note takes away a bit of the huge guilt that I still feel to this date for that one bite that I unknowingly took from the chocolate that was meant to be consumed by an earthquake survivor.

## **To Collect Data or Not to Collect Data—This is the Question?**

Many, if not most, academic disciplines are increasingly reliant upon the collection of numbers that can be compared and contrasted. Additionally, funding agencies and journals also turn to “hard” numbers to provide a litmus test for a given activity or approach. In academia, it is often

considered essential to provide hard evidence regarding impact to determine if the treatment or intervention was indeed effective in inducing the hypothesized effect. The ultimate goal of SAWBO animations is to increase public awareness on topics related to personal hygiene and wellbeing as well as correct methods for performing certain task related to agriculture or food preservation.

It might seem plausible to correlate the success of SAWBO with the number of people who watched the videos as a representative of impact. However, as we proceeded through this given process, it was highly apparent that once animations left the Internet or were placed on other servers, SAWBO had taken the correct path not to develop a technological approach to any way monitor the distribution of these animations. We faced an ethical dilemma in this particular case. It was possible to ask groups on the ground to collect and relay numbers back to our group. However, we knew that performance of any post-deployment assessment within Iran, by SAWBO or a third party, could potentially result in negative outcomes for anyone involved within Iran. Additionally, since the inception of SAWBO, we have chosen not to develop technologically-based approaches to track animations once they have left the Internet. Thus, this represents a case where the actual collection of on the ground data is not acceptable.

Certainly the paradox is how one demonstrates the impact beyond that of word of mouth when collecting hard evidence might jeopardize people's lives? This certainly brings us to the crossroads of what is technologically possible (i.e., tracking the animations electronically – which SAWBO does not do)? What is morally unacceptable in this circumstance (i.e., actually tracking the animations with the potential for a data breach), considering what the academic and donor communities often demand (i.e., hard numbers)? What we have, in fact, uncovered is a critical issue that we need to address as a collective community – how can we deliver important life-saving knowledge to people in dire circumstances in countries where repressive regimes do not want people to have access to this basic knowledge? What are potential ways to get this knowledge to them and still understand if we have had impact in the field and what is the level of that impact? As co-authors, and the SAWBO team, we do not claim to have these answers, but we propose that this is an important question that needs to be addressed.

## Conclusions

With no grants, no costs for expensive airlines tickets, no need to send money to the host country, and no need to leave their homes or step away from their daily lives, two Iranian expatriates were able to link with the SAWBO team to take an existing animation, place it into the Azeri language and deploy it into their country of origin - Iran. Additionally, this case represented SAWBO's first experience with responding rapidly to an emergency situation, with no previous track record of working in Iran, and no concrete deployment plan was in place at the beginning of this process. SAWBO simply reacted to the request to produce a version of this animation in Azeri and then left the deployment to two Iranian expatriates to try paths to get the animations into Iran through their existing networks. However, in spite of all of these above limitations, over ten thousand people are known to have viewed the Azeri language variant of cholera prevention animation!

Through two expatriates, thousands of miles away from home, and the help of hundreds of Iranians inside and outside the country, faced with a government that limits access of its population to information, we were able to place SAWBO materials in the hands of people who can most benefit from it. While anecdotal evidence points to a success of this attempt, SAWBO cannot provide hard evidence to map the reach and dissemination of this video as it might put those involved in great danger. This provides an opportunity for the academic community to look into novel approaches to these situations where conventional methods are not available or (as in this case) pose ethical dilemmas.

A next step in this process is to develop plans, networks and pathways in a proactive manner in countries across the globe, such that if or when a natural disaster takes place, a process can be followed with similar or greater levels of impact. Additionally, there will be a need for the development of further content useful in the case of natural or man-made disaster situations. Finally, there exists a critical need to develop impact-monitoring pathways for SAWBO that would guarantee privacy, and potential safety, of those that distribute and deploy these animations in countries where governments may not be supportive of helping segments of their own populations. However, until such foolproof system exists, SAWBO's strategy will not be to monitor the use of these animations once they leave the Internet social networks and SAWBO's online deployment systems.

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