WATER EFFICIENT DURHAM

OUTDOOR WATER CONSERVATION PROJECT

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CHAPTER 2

INTRODUCTION

From lawn use, to personal use, leaks, to evaporation, there have always been issues surrounding water conservation. In a country like Canada, where freshwater resources are abundant, the perceived need to conserve water is lower than in countries or states where water scarcity has long been a political and economic issue. There are many approaches that may be taken to alter society's habits, but sustainable behaviour above all else is the goal of any community-based social marketing program. One approach could be to emphasize water's importance from the simplest of facts. Water is the life-blood of the earth. The human body is composed of 60% water. Water is vital to plants, animals and even microorganisms. As it cradles ecosystems in water basins and supports ecosystems on land, it is a perpetual cycle circulating life around the globe (Dressel & Suzuki, 2002). "Like the beating of our hearts, water is so much a part of our surroundings and our bodies that we tend to take it for granted" (Dressel & Suzuki, 2002).

Less than one half of one percent of all water on the planet is accessible freshwater. "According to a report issued by the UN and the Stockholm Environment Institute, by the year 2025, two-thirds of the world's population will be affected by water shortages," (Dressel & Suzuki, 2002) thus increasing the need for implementation of effective water conservation programs.

Durham Region, for the past several years, has been experiencing much of what all communities in Southern Ontario are, an incredible population boom. Each summer, Durham Region and these same municipalities across Canada are faced with the challenge of providing fifty percent more water than at any other time during the year, this is known as the seasonal maximum demand. There is also a daily max demand that also influences the extent to which a water treatment facility must be built. High summertime water consumption coupled with higher standards for water quality and costs associated with best available technologies for water treatment have made the cost efficient supply of potable water to rapidly expanding populations a difficult challenge. If the "peak" could be reduced, this would in turn postpone the expansion of infrastructure required to, without interruption; provide potable water to communities (A. Samulski, 1997; 1999; 2000; 2001; 2002).

Education of the public is a difficult task. Previous efforts including traditional resources such as media advertising, bill inserts and public announcements may be a good idea in theory, but are unable to overcome the key challenge in residential water conservation, that being, effectively changing one's behaviour (Savina, 1997). Gail Savina of King County Local Hazardous Waste Management program aptly points out that the bottom line for marketing environmental behaviour change is that "information by itself is not sufficient to change behaviour" (Savina, 1997).

Recent research has shown that changes toward environmentally sustainable behaviour are best achieved through comprehensive, community-based social marketing programs (McKenzie-Mohr, 1996). Effective CBSM invests a substantial effort into researching the behaviour of the group and its various socio-environmental contexts, motivations, attitudes and barriers to better behaviour. Combining the findings of social psychology with the experience of product marketing to encourage environmentally related behavioural changes is the path that Durham Region has taken in order to potentially postpone the erection of infrastructure that will be able to supply the populace with an adequate water supply.

McKenzie-Mohr (1996) has suggested that the relationship between attitudes and behaviour is complex, and that desirable environmental behaviour do not necessarily follow a change in attitude toward environmental issues. Researchers such as Prose (1996), Cobern, Porter, Leeming and Dwyer (1995), and McKenzie-Mohr (1996) have shown that enduring behaviour changes are intrinsically motivated and that performing a desired behaviour frequently precedes the change in values and attitude. Community-based social marketing begins with a clear objective and accurate identification and assessment of the target audience.

When examining one's target audience, one must endeavor to research details regarding ways to overcome the barriers that the program may witness. With the use of incentives, disincentives, prompts, reminders and social influences CBSM encourages people to see the benefits. Tradition creates stubbornness within people, preventing them from easily adopting changes. It forces the CBSM program planners to view the obstacles from the people's perspective, and whether it be the intervener at the door, or the wording of the media prompt, it is essential that different approaches be taken to reach out to the multi-faceted conglomeration of characters found in the public. The process of breaking down barriers begins with simple, logical activities. Promoting a feeling of goodwill allows people to start the process of water conservation in a positive manner. If too much is asked at once, people will feel unable to "do good," and give up (McKenzie-Mohr, 1996; Knowles, Butler and Linn, 2000). Constant praise and understanding will over time help to build a good relationship, foster changes in attitudes and values regarding environmental issues and often follows a new set of behaviours becoming habit.
Prompts are a key CBSM technique intended to remind people to encourage a behaviour that they are already inclined towards. They are optimally placed as close to the site of action as possible to be most effective, for example the placement of the watering reminders on a hose tag, right on one's outdoor hose. Prompts are products that are used to gain the trust of subject group members, stimulate education and frequently overcome barriers. As with traditional, product marketing, the items used as prompts in CBSM projects must be appropriate to both the audience and the message being delivered. They must be perceived to have some value as a gift and they must work as promised.

A strategy outlined in McKenzie-Mohr's study of CBSM is social influence and the role it plays in encouraging sustainable behaviour. People typically encounter many different personal, social, political and economic situations in any given day and tend to alter both language and behaviour to suit the type of social interaction (Burling, 1992). Peer pressures of a neighbourhood can be a positive thing when they are promoting change in others considering an environmentally-related behaviour. Individuals have a tendency to compare themselves to their neighbours and adjust their behaviour to fit the community norm (Colehour and Fruse, 1997; McKenzie-Mohr, 1996).

Commitment is the ownership of an action; the knowledge of doing good, it is a strong motivator for undertaking further desirable behaviours. Once people have been educated, by their voluntary, not coerced, small commitment they are much more likely to commit to much greater commitments in the future, like watering only one inch of water per week, for example. A voluntary behavioural change leads to alterations in an individual's self-perception. Therefore, intrinsically motivated behaviour tends to be more permanent than coerced or externally regulated behaviour (McKenzie-Mohr, 1996).

CBSM is a highly respected practice in many communities around the world for integrating changes and promoting awareness for not only water conservation, but also, waste management, energy conservation, pesticide management, recycling, virus awareness and other health related issues.

While the strategies and techniques of CBSM have enjoyed significant success in health-related fields for a decade or more, their application to the environmental projects is a relatively new, increasingly popular way to facilitate behaviour changes. Community-based social marketing campaigns are popular because they emphasize results. The depth of audience research, tailored message content, interpersonal contact between field workers and subject group members, commitment, and feedback all contribute to the success of CBSM projects in the environmental field. However, Beverly Schwartz, (1995) director of social marketing at the Academy for Educational Development in Washington D.C. warns: "social marketing campaigns are also tricky. They must be conducted with sensitivity and care, or they will alienate the very people they intend to reach."

Around the world, especially in dry, desert like areas, water conservation practices are being introduced into communities. India receives over 1200 mm of rain per year, however the majority of this amount falls during the short 6-8 week period of the monsoons; it is the challenge of retaining this water for longer than a mere 2 months that is important to the sustainability of India's water supply. Just recently developed are "check dams," which create large water reservoirs, essentially lakes, which encourage consistent water flow through rivers that connect cities with a potable water supply. Without check dams, water rushes rapidly through rivers, causing them to dry up much too fast and prevent water preservation (Dressel & Suzuki, 2002).

SPAAC, Social Planning Analysis and Administration and Consultants is a private Egyptian consulting firm established in 1981 that undertakes projects of analysis, planning, technical assistance for upgrading capabilities and institutionalization, social marketing and mass media for raising public awareness, and research for policy and decision-making. SPAAC has worked in sectors as diverse as public/primary health care, environment, gender, agriculture and rural development, micro-enterprises, NGOs, urban planning, etc. They pride themselves on their ability to understand the Egyptian and Arab scenes, to work within the socio-cultural constraints that impact them, and make optimum use of the positive potential within to create sustainable change and especially emphasizing on social marketing which is essentially CBSM (http://www.spaac.com/Default.htm).

Germany is focusing on increasing use of composting toilets, and green roofs. The local politics are becoming more centered on environmental issues, as politicians are being voted in based on their perspectives and commitment to developing conservation tactics. Community-based social marketing has been a large part of Germany's recent conservation efforts, with great success community awareness and involvement are truly supported (Dressel & Suzuki, 2002).

Jordan and Israel have been faced with many serious issues in the past decade or so; it has been estimated that Israel has 10 years left maximum of accessibility to water. Many farmers in both countries have been forced to leave their crops to fallow because of the serious water shortages, leaving the country in serious jeopardy regarding not

only water but foods supply; no serious endeavors have been made to implement conservation techniques (Dressel & Suzuki, 2002).

"As often happens with human developments, we mastered the technological skills to make these massive changes before we understood the reverberations" (Dressel & Suzuki, 2002). Worldwide there is a continuous stream of projects taking place, some have discovered better ways to access underground water reservoirs, and prevent the hassle of water conservation, other projects have revealed the detriment of implementing these projects. New light has been shed on the idea of check dams, finding that they really do not work and last as had been originally projected. It is for these reasons that it is so critical to introduce a project that works, like community-based social marketing has illustrated and proved over the past few years in Durham.

Durham Region is a pioneer of the techniques promoted by CBSM. Its popularity has been consistently growing over the years and has even recently been adopted by the Ministry of Natural Resources with their "Anti-idling Project" in Toronto. Their project fostered the principles of CBSM by including such things as personal contact, the use of prompts, and signs. School zones and TTC "kiss and ride" zones were targeted and informed idlers of the hazards to one's health and the environment from idling. As a result of much hard work and the support of many country wide sponsors, the city of Toronto received a total commitment of 32% to stop idling and a staggering 73% agreement to reduce idling time; the most support for the project was from school zones. The project was prompted in Toronto and recently London by the implementation of an anti-idling by-law; there is also another by-law introduced preventing the construction of drive-thru's within close proximity to residential areas. Upon completion of the program people were informed of venues where info kits and other information would be available to continue increasing public awareness (http://oee.nrcan.gc.ca/idling/tool_kit/turn_summary.cfm?PrintView=N&Text=N).

California's public health institute has taken CBSM to another level and introduced project "L.E.A.N." LEAN stands for Leaders Encouraging Activity and Nutrition and the mission of the project is to "create innovative partnerships that help low income consumers adopt healthy eating and physical activity patterns as part of a healthy lifestyle." It's a different venue for use of CBSM but the results prove that once again its techniques work (http://www.californiaprojectlean.org). From the developing to the developed world, CBSM is widely supported, proving time after time that there is a successful way to creating sustainable change.

Both Toronto and Halton regions have joined in the fight for water conservation using the CBSM method. Although they have adapted their own interventions, prompts and media, the general objective of the project remains the same, reduce the peak use of water during the summer months.

In the summer of 2003 Halton's water conservation project became Durham's sister parallel project; as a result of a last minute change in personnel, Maple Durham acquired the project. Since the initial stages of McKenzie-Mohr's strategy for CBSM had already been carried out previous years in Halton region, the Maple Durham team carried out the same cycle of redesigning, and consistently improving techniques, for the summer project much like Durham Region's plan.

Now in its seventh year of action, the Water Efficient Durham program has become well aware of what works, overcoming its barriers and constantly striving to achieve more awareness throughout communities. The past involves a deep history of alterations to the CBSM ethic to find what works. In its first year, Maple Durham took on the first steps outlined by McKenzie-Mohr that were necessary to designing and evaluating a program; the following are all the steps outlined in order by him:

1. Review Literature
2. Design and Conduct Focus Groups
3. Design and Pilot Phone Survey
4. Conduct Phone Survey
5. Analyze Phone Survey Data
6. Design CBSM Strategy
7. Test Strategy with Focus Groups
8. Pilot and Refine Strategy
9. Implement Strategy across Community
10. Evaluate Community Impact

In 1997 Durham Region implemented a water efficiency pilot project hiring Maple Durham to design and carry out the project. The objectives of the project were to identify and test the CBSM ethic to achieve a 10% reduction in summer peak water consumption. Before any field work was done, any prompts given out, Maple Durham executed the essential first steps McKenzie-Mohr emphasizes to begin a CBSM project, those being: a literature review, (which is done every year thereafter) design and conduct focus groups, design and pilot phone survey, and finally analyze phone survey data. Then, a CBSM strategy was designed for the summer (McKenzie-Mohr, 1997).

The project area was divided into three areas, first, a control group, second, a passive group, where delivery of info was made, with no contact, thirdly, block leaders and student teams using CBSM, comprised the three areas and helped to decipher if the CBSM ethic was going to work. Contact made for six weeks was casual in the third described area, observations were made by bike and a baseline of people's habits was compiled. Prompts like the rain gauge were given out and commitment forms illustrated that 71.8% of residents committed to reducing outdoor water use by the end of the summer (A. A. Samulski, 1997).

Every year thereafter, the pilot study Maple Durham would repeat the cycle of the last steps McKenzie-Mohr (1997) outlined in his book. These cycled items are: the literature review, a re-evaluation of a CBSM strategy, test strategy with a focus group (the given neighbourhood for the summer), pilot and refine strategy (make necessary adjustments as the interventions are carried throughout the summer), implement strategy across community, and finally at the end of every summer evaluation of community impact is done in the form of a report.

With the successes of the previous year's CBSM techniques it was decided that the objective of the 1998 summer was to reach more houses and more interventions were used. Each intervention involved a prompt and CBSM ethic was expanded and developed an even greater response than the summer before, attracting the attention of even more of the community.

In the summer of 1999 in addition to the same interventions used as last year an Ultra Low Flush (ULF) 6L toilet subsidy was implemented in the Port Perry area. As is done in

many cities currently (2003) this technique of CBSM is usually extremely effective due to its nature of breaking down major barriers. People were subsidized to reduce an issue with cost, free installation prevented people from claiming that installation would be too difficult, and interveners came right to people's homes so no one needed to go anywhere to take advantage of this offer. Results showed that there was a barrier according to gender that had not been previously expected. Males were much less likely to accept the ULF toilets than females. The number one reported problem with the ULF toilets was the requirement of flushing more than once, however, 82% of participants said that they would recommend a ULF toilet to a friend and as reported from the phone survey, the same number of people chose to use the ULF toilet for water conservation reasons as well as money saving reasons. A critical point to note is that an area that had previously received CBSM had an extraordinary positive response towards the project compared to residents that had never received any CBSM programs.

During the summer of 2000, one of the chief goals was to achieve a greater cost effectiveness of the program by concurrently lowering the cost per household, while increasing the number of participating households. Interveners learned that building a rapport by spending more time talking with residents helped to establish the team as a legitimate source of information, thus every year subsequently this idea was emphasized during trainings (A. A. Samulski, 2000). Cooperation with the Second Marsh in Oshawa was also an important element as they were helping with the project in hopes to decrease the hazardous runoff from houses using pesticides etc. which was draining into the fragile ecosystem of the marsh.

The project in 2000 was subject to water metering by Veritec Consulting Inc. A primary goal of the project for the summer was to physically quantify the water demand savings due to the student's activities. However, it was decided, that monitoring individual households would not produce sufficiently reliable results as residents may have a tendency to modify their 'normal' water using habits if they know their behaviour is being recorded (A. A. Samulski, 2000)

A more accurate method was devised that involved bulk monitoring the water demands of the participating homes. Bulk monitoring involves installing a water meter and data logger directly on the water main supplying the entire group of participating homes. Each area being supplied water through this single metered source is called a District Meter Area (DMA). Water demands were recorded every five minutes throughout the program. It was also decided that two similar Whitby areas would be included in the bulk-monitoring program – one area serving as the study area and the other serving as the control area. Because the intervention only took place in one area (study area) it was possible to compare the household water demands of these areas and to quantify the savings that were attributable to the program. Additionally, because the participants were not aware of the monitoring program their reaction to the intervention was natural, i.e., the demand data was not skewed by modified water consuming habits (A. A. Samulski, 2000). It was discovered that people did in fact, reduce their water consumption throughout the summer, throughout the reoccurrence of interventions involving prompts and information. The 2000 WED project gained commitment in 83% of the households contacted.

Data was collected again by Veritec during the summer of 2002. The conclusions from this metering illustrates irrigation savings from 2000 study area have reduced slightly over time, but are generally being maintained (87% savings originally achieved in 2000).

The irrigation savings achieved in the 2002 study area are in line with the original savings achieved in the 2000 study area even though the summer students implementing the CBSM program were required to cover a significantly greater number of households during the period; thus reducing the cost of implementing the program to drop from $45 per household in 2000 to $24 per household in 2002. Both programs, however as reported by Veritec, are more cost-effective than expanding water treatment/distribution infrastructure. "The difference in irrigation demands in the two areas (Pickering and Ajax, 2002) during this period was 250 litres per household per day (924 litres in the control area and 674 litres in the 2002 study area). These results indicate that Durham's 2002 CBSM program is having the desired effect of reducing irrigation demands in the study area even though the ratio of students to households was significantly increased from the 2000 program.

In 2001 social diffusion was employed based on the ideas of Gladwell, McKenzie-Mohr and others. *The Tipping Point* (2000) discusses the social diffusion of ideas, and behaviour, thus began the introduction of mavens to the areas in the program that summer. Maven's, water conscience residents of the neighbourhood, held the responsibility of being the example to others, reinforcing water efficient practice and liaison with the interveners of Maple Durham. Unfortunately the change in technique did not result in substantial response from the community as shown by the commitment forms taken at the end of the summer; it was learned that for social diffusion to work, a longer and deeper development time is needed for greater success. In addition, the mavens were unprepared or unwilling to follow through with the responsibility entrusted to them. Since the results were far below expectations the use of social diffusion was abandoned until further developmental work could be completed. The benefit of having four or five interventions was explored, as it turns out there was no further decrease of water consumption using five interventions rather than just four in a given summer.

Highlights from the summer of 2001 include, 79% committed from the previous 8% of the residents already measuring, agreed to measure. Eighty-two percent committed to leaving their grass clippings on the lawn from the previous 18% that did prior to the summer project as stated in the baseline questionnaire. Seventy-nice percent agreed to select plants based on their water requirements in subsequent years compared to a mere 15 % that initially did (A. A. Samulski, 2001). An evaluation of the W.E.D. rain gauge program specifically was completed by Freeman Associates (2002). Similar to the Veritec water metering in 1997, this report was an aid to determining the effectiveness of the program and gather feedback from residents. Unfortunately, the conclusion was not as supportive of the program as it potentially could have been due to the summer's conflicts with working with social diffusion (A. A. Samulski, 2002). Community-based social marketing was re-adopted in 2002. Maple Durham hired six post-secondary students to comprise the Water Efficient Durham (W.E.D.) team. Their responsibilities included approaching residents and discussing specific issues related to water conservation such as: lawn care, xeriscaping, indoor water conservation, rain barrels, redirection of drain spouts, hose washers, water recycling, the odd/even watering by law, and proper watering times. The chief goal was to reach 3000 homes, almost doubling the amount of homes reached in previous summers. In order to accomplish this goal, the W.E.D. team adopted a more aggressive form of CBSM. The major success of the summer was the 80%+ agreement from residents to commit themselves to reducing outdoor water use.

From the huge success of 2002, moving into the summer of 2003, Maple Durham realized that they had a CBSM strategy that worked with a greater number of homes. The same course was taken, interveners making contact with a minimum of 80% of residents for a total of four interventions once again proved to complete another successful summer. However with a new year, come new issues surrounding the mega-city. With the scare of the west nile virus ending 2002's summer, the city launched a wide-spread media campaign informing residents of the issues at hand for 2003. This of course changed Maple Durham's approach to encouraging rain barrel use and rainwater collection in general. This was the best decision to be made especially since last summer's questionnaire which had encouragement of rainwater collection was criticized at large by many residents; thus this question was removed for 2003.

The city of Toronto also instigated a new by-law cautioning the use of pesticides on residential lawns. It is clear that they are over-used by residents, what is not well known is the damage that the chemicals from them do when caught in runoff as they travel to water supplies and fragile ecosystems. Maple Durham fielded many questions regarding this issue with residents and for the sake of water conservation that this by-law will help to change people's use of pesticides.

The students hired for the 2003 summer were given uniforms consisting of a t-shirt, hat, and photo I.D. nametags. The t-shirt featured "removing mountains of water" caricature depicting a summer peak for water based on lawn watering demand, and the front featured a Water Efficient Durham embroidered logo. The hat featured the same embroidered logo, and was used both as protection from the sun, and to increase visibility. Uniforms were worn in the intervention areas to identify the students as a trustworthy source of information in the community, and to increase project visibility.

The study was conducted in two areas, one in Pickering and the other in Brooklin, each with approximately 1500 homes each. By conducting the project in two different areas the W.E.D. team was also able to compare the relative acceptance of the CBSM interventions in two separate neighbourhoods, further increasing the economies of scale.

The students visited each household at least four times throughout the summer. The group members provided a new tool and information at each intervention. This way, major behavioural change is broken into smaller, manageable requests that over time generate large change with little or no perceived inconvenience or discomfort to the resident. Students approached households throughout the afternoon and early evening (1:00pm-8:30pm).

Brooklin is a very young community and the majority of houses likely range from 1 to 5 years in age with construction still occurring. Housing costs range from $180,000-$250,000 and in size from 1500 sq. ft. to 3,000 sq. ft. The greater population of homes are subdivisions with average-small sized lots; there are a few older homes however that are not subdivisions and have very large lots. The area is just north of Whitby and is home to many young families lacking cultural diversity that all come home at five o'clock on the dot. It appears that most are well educated, posses a positive attitude towards conservation and enjoy living in a small town atmosphere.

The Pickering location is found at the southernmost area of Pickering, some lots looking over to a fabulous view of Lake Ontario, or the Petticoat Creek Conservation Area. The homes range in value and age and condition; $150,000-$400,000, 1400 sq. ft. – 5,000

sq. ft. The majority of homes are quite old, perhaps thirty-five years plus; some have very small lots, not well taken care of and weedy. Some of the others are huge homes on huge lots that are in much better condition. Lastly, there is an average sized subdivision, small in comparison to the total area's size, housing mid-large homes and well kept lots. The people of Pickering range just as much as their housing although the majority seems to be families with older children in high school or post-secondary; there are also a lot of older couples in the area, young families are not found here, cultural diversity is noted. Incomes are much less and are thus reflected in the maintenance of the homes.

By using the active CBSM approach, the 2003 W.E.D. team is able to reach more people, educating them on the effects of water efficiency. The purpose of the 2003 project was to follow up on the success of 2002, with equal or better results. Modifications include the use of the preliminary introduction letter distributed in Pickering. Goals continue to include achieving long-term behavioural changes that would lead to a reduction in the amount of water used outdoors during the summer. A reduction in water consumption will not only save each household hundreds of dollars on their utility bills, but will also save Durham Region millions of dollars on water infrastructure in the long-run. Because CBSM eliminates barriers by providing residents with tools, prompts and information, residents are educated and hopefully convinced to adopt and engage in environmentally sustainable behaviours. These behaviours in turn reduce the amount of water consumed by the household, and help reduce the peak water consumption experienced during the hot summer months.