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Promoting solar water disinfection in schools: experiences and lessons learnt in Latin America

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Assessments of WASH promotion programmes showed that it is difficult to produce sustainable habit changes at community level. Teaching of children and transferring the message from school to the community is a promising approach to increase impact and sustainability. The Fundación SODIS implemented projects promoting household water treatment, with a special focus on solar water disinfection, and improved hygiene in more than 1'000 schools in Latin America, training more than 8'000 teachers and 170'000 Students. The experiences made during these projects showed that children do assimilate new behaviour faster and better than adults and that they can function as triggers for behaviour change and consolidation of new habits in the community. The most important factor to support assimilation was the ritual combination of elements to a complex behaviour pattern. Implementation of SODIS in small, rural schools was very successful, while promotion in big urban schools encountered difficulties.

Introduction

Solar water disinfection - the SODIS method - is a simple procedure to disinfect drinking water. Contaminated water is filled in transparent PET-bottles and exposed to sunlight for six hours. During this time, the UV-radiation and heat of the sun kills bacteria, viruses and protozoa which may cause diseases. The SODIS-method helps to prevent diarrhoea, cholera and other waterborne diseases and thereby is saving lives of people and protecting their health (Conroy 2001, Graf 2010). It has been promoted as an additional option to disinfect water at household level over the past ten years, reaching several million people worldwide.

The SODIS Foundation is co-implementing and monitoring projects aiming at promoting household water treatment and hygiene promotion in Latin America. At the local level, the Fundación SODIS tackles the problems of knowledge dissemination and behavior change through a systemic approach, including all relevant actors in its areas of work in order to reach a maximum impact: NGOs, grass root organizations, academia, governmental and international agencies.

One important element of the local systems are schools with their respective actors (pupils, teachers, administrators, parents). Over the past few years, the SODIS Foundation has implemented projects in more than 1,000 schools, trained more than 8,000 teachers and 170,000 students. The present paper highlights some of the key experiences and lessons learned in these projects.

Theoretical background

General system theory (Bertalanffy 1968) explains social systems as complex settings with interactions between elements: All systems consist of elements, interactions, and inside/outside environments. Social systems – like biological systems - tend to be self reproducing. They are being built up in social processes, and persons are socialized into these systems (Luhmann 1995), mainly in these young years as children in the family and in school.

The transmission of ideology and the internalization of social norms and habits is an important function of the socialization process. The process aims at the integration of the individual person into society with its

norms and institutions. The details of the process of internalization have frequently been described and explained in the framework of **anthropological theory of ritualization** (Bell 1992) and initiation: beliefs materialize to ideologies, behavior to habits and both get fixed into structures, patterns of a belief and behavior system. Societies force their members to pass through a process of socialization and steps of initiation, which means submission and recognition of the given value, institutions and authorities. In Western societies schools and military service are two of the most important institutions where these phenomena can be observed easily.

Why start behavior change at schools

Several studies on the sustainability of household water treatment promotion created doubts about the sustained impact of earlier promotion questioning the long-term maintenance of trained behavior, self promotion, change of habits and culture. Evidence showed that the results of these impact indicators were not as good as expected (Arnold, 2009). Training of children and a systemic approach with socialization mechanisms were identified as potentially more effective. Children are very good receptors, because of their open-mindedness towards new messages and new forms of behavior. The systemic approach is the basis of socialization, creating clusters of behavior that stick together and reinforce each other. They are trained in the socialization process and fixed by initiation rites like exams. In everyday language, these fixed behavior settings use to be expressed as "habits". Habits are sophisticated results of the socialization process, they are elements of culture that can be integrated into a complex system forming typical cultural patterns, e.g. Swiss cleanliness, Mexican courtesy.

The SODIS Foundation combined strategic orientation, methodological basic decisions and special techniques and tools to work together; aiming to create a new and effective methodology of promoting point-of-use water disinfection and hand washing behavior that stands a chance to get integrated in a new culture, a culture of healthy habits. Over the last years, the organization has developed such a methodology and proved its effectiveness at large scale, training more than 8000 teachers and 170.000 students in 1000 schools in six Latin American countries.

Tools and techniques applied

Every intervention included **a base line study** and a **final evaluation** based on participatory and comprehensive techniques derived from the Rapid Rural Appraisal method (taking and painting pictures, socio dramas, etc). The training itself used the "HASS" methodology ("HASS" in Spanish, for hygiene, safe water and sanitation). It included water quality analysis with a commercially available Presence/Absence test ("**Pathoscreen-test").** This proved to be very effective because people can observe themselves if the water quality is adequate for drinking or not.

Materials were developed that helped teachers present and discuss the topics of hygiene, water and sanitation (WASH) and training their implementation. These materials include flyers, posters, painting books, videos, theatre and marionettes. Teaching WASH includes talking about certain **taboos**, like not eating without hand washing after using the bathroom, or not drinking any raw water, as well as some **imperatives** like hand washing in critical moments and putting bottles into the sun in the morning. In this context, it proved very useful to train the most active and interested kids as **leaders**, who take some responsibility for their classmates performance and behavior and serve as role models. Some teachers showed a very creative and dynamic assimilation of the training and developed new and additional techniques to teach and implement healthy habits related to WASH. The **"ritualization"** of desired behavior (here: hand washing and water disinfection) proved to play an important role.

For small, rural schools and young children **SODIS** is a very appropriate method. The familiar character of rural schools helps to organize the common using and sharing of bottles. Schools with many children, in contrast, are not ideal for the application of SODIS, since several turns of students use the same facilities and the same infrastructure. In schools where SODIS is implemented, it is important and helpful to implement specific exposure tables made by wooden pieces and a piece of corrugated metal. This fixed setting ("SODIS tables") reinforces the magic of the ritual. SODIS has the advantage to be seen like a magic behavior by young children. **Magical procedures** and **magical settings,** like putting bottles into the sun on a "SODIS table", are quite helpful for forming new habits.

When implementing SODIS at schools it quickly became evident that it is important to give the water disinfection process a fixed place, the "SODIS table" in order to solidify the water disinfection behavior into a habit. This is the first step to **ritualize and fix the behavior** as an unconscious running sequence of small

behavior steps. This factor was facilitated by adding other elements of ritualization into the new behavior regarding its particular space and time: In the classrooms and sometimes in the courtyard a kind of a "**sacred place**" was built for hand washing at critical moments, and another one for storing safe water. Putting a certain timetable, a **"sacred time",** to the ritual, like hand washing after using the toilet and before serving the school breakfast is another important factor to fix it. This way it was possible to build up clusters of behavior elements, which were related to external stimuli, like time, place, arrangement in combination with using the bathroom, and eating breakfast. This transcended isolated behavior elements and integrated them into a complex ritualized sequence in a specific context or, in sociological terms, a "system" of behavior which in everyday language is referred to as "habit".

Many schools had the students make **wall paintings** to promote the healthy behavior. When completed, schools also took part in **public events** like parades on world water day or hand washing day, displaying messages and calling for political support. In other instances, the kids prepared public presentations of materials developed at the school, and demonstrations of healthy behavior. In some cases these activities were integrated into a creative competition with prices for the best ideas put into practice.

A **mass media campaign,** mostly through radio generated additional attention and dynamics. Sketches, songs and jingles were used to reconfirm the previous face to face messages on healthy behaviors.

A serious constraint of the programme was the lack of adequate sanitary infrastructure in many schools: The **toilets** frequently are inexistent or dirty or not working at all, and the water taps often are broken or closed. If that is the case, the teaching of healthy behavior may seem like a bad joke rather than a serious intention. That is why at present the SODIS Foundation is starting to integrate **infrastructure improvements**. Another problem is the fact that many schools do not operate continuously; interruption because of holidays, teacher strikes, and other causes go against routine and weaken the results of habit formation (apart from their impact on school performance).

Maybe the most important obstacle for scaling up the promotion of WASH at schools is the **absence of these topics from most school curriculums** and the lack of their institutionalization in the teacher´s formation. This means that everything implemented by the teachers depends on their own initiative and disposition to do some extra work without official recognition. In theoretical terms: it is not part of the system, or: it does not belong to any sacred space and time. In order to overcome this problem in the short run the SODIS Foundation monitored the teachers' participation and activity and honored them with certificates. The long term solution has to be some type of recognition by the Ministry of Education which should put WASH into curriculums of student and teacher formation.

From schools to the community

A significant health impact from WASH intervention can only be achieved, if the improved behavior such as household water treatment and handwashing at critical times is consistent and takes not only place in schools, but also in the households. The Fundación SODIS therefore complemented the school promotion with community interventions. The idea was: firstly: use the open-mindedness of school children to teach new habits, and secondly: give children the role of intermediaries and trainers who exercise influence on their parents and the community. Teachers, parent's councils and local authorities are also part of the target group. Whereas children transfer the new behavior, teachers, as well as elected representatives and municipal technicians can give support and authority to their messages and activities. The SODIS Foundation recognizes these different roles which have to complement each other and act as a cluster of elements which re-enforce and support behavior change.

Voluntary promoters were used during the face to face campaigns to support the behaviour change process in the community, but this strategy turned out to be rather difficult. Many promoters only assumed the job because they expected some attractive incentives, either salary or access to important information, status etc. Therefore, the programme regularly lost promoters, particularly those with a better school formation, as they moved on to more interesting jobs. To involve active women from the community in teaching their neighbors and friends turned out to be a very good alternative to working with promoters.

Lessons learned

- Indeed, children do assimilate new behavior faster and better than adults.
- It is important to create complex behavior clusters (habits) and factors which support each other if the objective is to create lasting (sustainable) habits.

- Ritualization (proceedings, magical behaviors and values, specific times and places, settings, etc.) as well as social factors like peer leaders, support the learning process.
- The most important factor to support the assimilation and solidification of habits was the ritual combination of elements to a complex behavior pattern (a system): its systemic environment, sacred places and times, magical movements and explanations, and routine.
- Exposition tables (SODIS tables) are very important to establish and solidify the practice of SODIS – they give the habit a specific place and also serve as reminders.
- Projects in small, rural schools were very successful, the ones in big urban school encountered many difficulties. Teachers of small schools use to be more motivated and exercise a positive influence on their community as role models.
- Promoting WASH issues at schools is feasible, not very expensive and produces good results.
- Good materials for the teaching facilitate the teacher's job.
- It is important to accumulate and use knowledge at local level. Many elements can change from one place to another.

Summary and suggestions

Assessments of practitioners and researchers of many years of promoting WASH training showed that it is difficult to produce sustainable habit changes at community level. Teaching of children and transferring the message from school to the community is a promising approach to increase impact and sustainability. Experiences of the SODIS Foundations confirm this hypothesis and produced a lot of empirical evidence on factors that support the formation of habits and solid behavior patterns.

These empirically observed positive elements can be interpreted in the framework of anthropological theory on rituals as a way to stabilize certain cultural structures. System theory also provides a theoretically valid frame. We suggest that these empirical and practical observations should be investigated with academic rigor on the background of the mentioned theories.

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