



# Promoting SODIS in Guatemalan villages

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**Experience in Guatemalan villages shows that SODIS is most successfully adopted in rural areas where other purification methods are less affordable, and where promotion is directed at the whole family and accompanied by health and hygiene messages.**

Over the past eight years the NGO COMENSA has built over 20 gravity-fed water systems and 80 school hand-washing stations in rural mountain villages in the Nebaj Municipality of Guatemala (latitude 15° North, longitude 91° West, altitude 2000–2800m). Comensa is a non-profit organization working in Guatemala in association with rural villages, local government and volunteers to promote health through the provision of clean water supplies and hygiene education. Although HACH bacteria presence/absence tests have shown the majority of the springs in the area to be contaminated, cultural habits require water systems to be low maintenance, therefore no water treatment is included.

During the construction phase, COMENSA employs a local health promoter to carry out teaching within the village. His experience is that villagers – and particularly children – still consume untreated water, although they may understand the dangers. For this reason, in 2002 COMENSA became interested in the role SODIS might play in these villages.

## SODIS feasibility study

Before promoting SODIS, COMENSA carried out a feasibility study from October 2002 to January 2003.

*Field test – optimum time of exposure.* SODIS was field tested in the village of Vitostix for the three-month period. HACH bacteria presence/absence tests were used to determine the optimum period of exposure of the bottles and to test the effectiveness of shaking bottles for aeration prior to filling completely and exposing. During

this time a total of 102 bottles were exposed and tested. The experiments resulted in the following findings: six hours of daylight were sufficient for water purification under sunny conditions, 12 hours under cloudy conditions and non-shaken bottles were purified by the same exposure period as shaken bottles.

It was decided to teach families to expose bottles for one day in sunny conditions and two days in cloudy conditions, and to discourage storage of the purified water in a larger receptacle in order to cut down on potential cross-contamination and bacterial re-growth. The hepatitis A virus and bacterial spores are not killed by SODIS, so water must be consumed within a day or two in order to prevent the risk of bacterial re-growth.<sup>1</sup>

During this time the health promoter made household visits in Vitostix in order to assess the suitability of SODIS in the area. Although each family said that they boiled water prior to consumption, boiled water was not stored. Therefore people are likely to consume untreated water at times when boiled water is not available.

## SODIS promotion in the villages and youth clubs

With a view to improving health in the villages by replacing untreated water consumption, COMENSA now promotes SODIS along with its health and hygiene programme. To date this includes the villages of Vitostix, Vicampanavit and Vicotz.

While living in the villages, the COMENSA team practised SODIS, using an exposure table coated in

aluminium. Villagers were curious about SODIS and keen to be involved in the project. During this time the local health promoter made household visits to promote health and hygiene and teach SODIS as an alternative to consuming untreated water.

After the household visits, a village meeting was held to clarify the method. Each family was given six, clear-plastic bottles of 1.5 litres, an exposure table and leaflets depicting water boiling, chlorination and SODIS. Follow-up household visits were then made to continue health, hygiene and SODIS support. In this way bad SODIS practices were detected and corrected. This included wrongly positioned tables and the storage of purified water in containers prone to contamination.

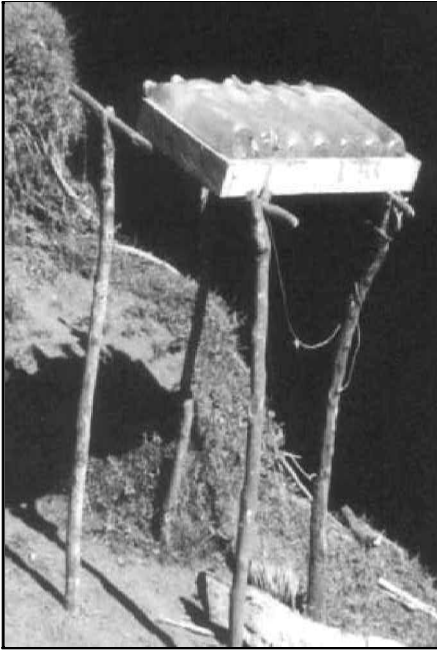
In Vitostix, teaching included the technique of shaking bottles prior to

### Box 1. Youth group SODIS meeting

One hour's teaching included visual aids and group discussion, covering the following topics:

- the contamination of water
- the health consequences of consuming contaminated water
- ways to break the cycle of contamination (emphasizing the boiling of drinking water and hand washing)
- the SODIS method.

Half an hour was spent building the SODIS table for each home in groups. COMENSA provides the materials for each table on the understanding that each young person would teach at least one neighbour the SODIS method.



SODIS bottles on a table that raises them out of the shade

filling completely. Bottle shaking prior to exposure can increase the efficiency of SODIS by introducing oxygen to the water. Exposure to sunlight then produces reactive forms of oxygen which contribute to the effect of the UV radiation in killing micro-organisms. However, subsequent monitoring identified that this confused people, with the result that some half-filled bottles were exposed.

Teaching in Vicampanavitz and Vicotz did not include the shaking technique.

In March 2003 SODIS was promoted (see Box 1) in three village youth groups in the Nebaj Municipality – two in La Pista with 30 participants, and one in Las Violetas with eight participants.

## Monitoring

In Vitostix, Vicampanavitz and Vicotz, SODIS was monitored through household visits during the construction of the water system. Surprise household visits were carried out to each family two months after construction was completed in each village. In Vitostix two SODIS discussion groups were also carried out, with the men and women separately. The level of understanding and acceptance of the method was thus identified.

In La Pista and Las Violetas surprise household visits were made to random

houses from each group one month after teaching in order to gain feedback. Four houses were visited in Las Violetas and 10 in La Pista.

## Was the promotion successful?

Ideally, one would want to monitor the effect SODIS had upon the health of the households where it was being practised. However, COMENSA works in villages where health statistics are not kept centrally though the Ministry of Health. Indeed, clinic disease records are only recorded by age and disease, and not by village or family name. Therefore there is no baseline data to work on, and no method of monitoring the incidence of water-borne diseases. Additionally, indicators of the health benefits of clean water to a population are very difficult to measure, due to other sources of disease in the household. It would be very difficult to identify whether a disease was from a water-borne source or not. For these reasons, household monitoring was restricted to determining if a household understood the SODIS method and was carrying out SODIS correctly.

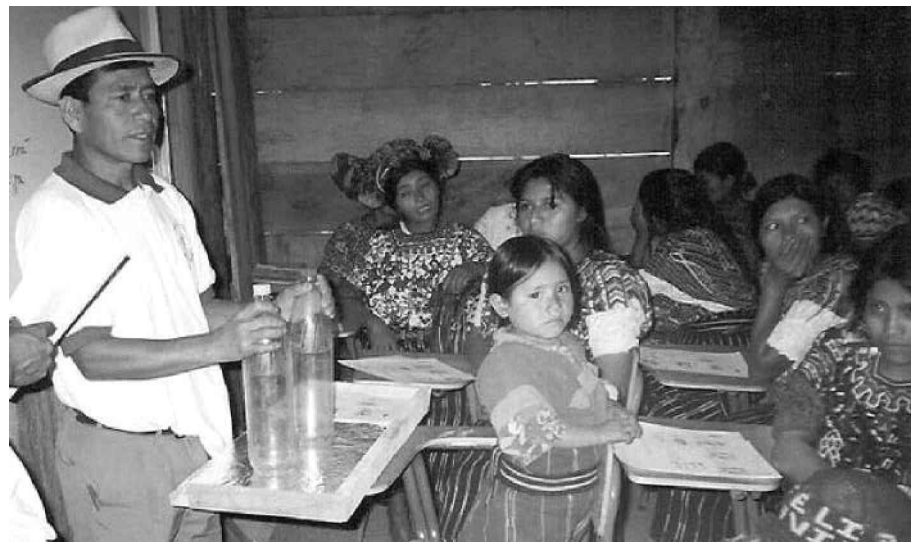
*Vitostix, Vicampanavitz and Vicotz.* Most of the families in each village showed a real enthusiasm for SODIS from the onset of the project, and at the end of the teaching period understood the method correctly. During the surprise monitoring, the percentages of families observed practising SODIS

was 81 in Vitostix, 75 in Vicampanavitz and 90 in Vicotz. The remaining families understood the correct SODIS method and professed to be practising it, but the onsite evidence suggested that they were not.

It was found that SODIS is replacing the consumption of untreated water, especially for children. One father from Vitostix noted 'I only drink *atol* (a hot drink made with maize) but my four children, who are used to drinking cold water, drink eight SODIS bottles a day'. The adults are less accustomed to drinking cold water, indeed 20 per cent of families said that it was only the children that drink SODIS water. However, some adults mentioned that although 'it was at first unfamiliar, they now like the taste of the SODIS water', while some said that they 'mix it with sugar to make it taste better'.

Most adults drink SODIS water when working in the fields, when previously they would have drunk untreated water from surface water sources. SODIS water is also used to regulate the temperature of boiled drinks (e.g. coffee and *atol*), which were previously mixed with untreated water.

It was found that, on average, families of five to seven persons tend to drink three of the 1.5 litre bottles per day. SODIS teaching was carried out during the dry season (November–May). The hot, dry conditions created a demand for cold, readily available water, and many families noted that



SODIS training in Vicampanavitz, where three-quarters of families were practising SODIS correctly a month later

Table 1. SODIS programme in Vitostix, Vicampanavitx and Vicotz

	Vitostix	Vicampanavitx	Vicotz
Families	31	45	45
Type of system built	Spring capture Distribution tank School handwashing station Household tap stands	Spring capture Distribution tank School handwashing station Household tap stands	Spring capture Distribution tank School handwashing station Household tap stands
COMENSA team working and living in village	Four masons Two–three volunteer engineers One health promoter	Two masons Two volunteer engineers	One mason Two volunteer engineers
Timescale	SODIS feasibility study October 2002	System construction, SODIS promotion and monitoring January 2003– March 2003	System construction, SODIS promotion and monitoring
	System construction SODIS promotion and monitoring October 2002– January 2003	SODIS feedback visits May 2003	January 2003– March 2003
	SODIS feedback visits March 2003		SODIS feedback visits May 2003

they only needed to use SODIS when it was hot, as they preferred to drink coffee and *atol* when the weather was cold. An average of 30 per cent of families said that they doubted the effectiveness of SODIS when it was cloudy and rainy and did not practise it at these times.

*The youth groups of La Pista and Las Violetas.* In La Pista, only one-third of the participants were carrying out SODIS daily. Non-participation was due to various reasons, such as a dislike of the flavour, the time that the process takes or a lack of interest. A number of participants mentioned that their neighbours were very interested in learning about SODIS. In Las Violetas, none of the households visited were carrying out SODIS. Non-participation was due to a lack of understanding due to language problems, mistrust of the method or a lack of interest.

La Pista and Las Violetas are peri-urban towns where people tend to have higher levels of income. SODIS may not be appropriate in these areas, therefore, as people have more money to buy fuelwood for boiling water or chlorine for purification. These towns have also been involved in an improved stoves project, which allows them to utilize fuelwood more efficiently.

## Conclusions

The promotion of SODIS has been successful in the villages of Vitostix, Vicampanavitx and Vicotz where the majority of families (81, 75 and 90 per cent respectively) are practising SODIS, and are doing so correctly. In these villages SODIS is replacing the consumption of untreated water, as demand dictates. One of the main reasons that SODIS teaching has been successful in these villages is that it was taught alongside health and hygiene promotion over a period of two to three months. People were taught the implications of drinking untreated water alongside learning the SODIS method.

COMENSA is now convinced that SODIS is a suitable method for improving health in this region and is promoting SODIS in all of the villages it works in.

## Recommendations

This study has identified a number of key factors for the successful promotion of SODIS that are likely to have wide application:

- SODIS should be promoted to the household as a whole in order to

avoid mistrust among family members.

- SODIS may be more suitable in remote rural settings than urban areas where income levels are higher and other resources, such as fuelwood for boiling water, are available.
- SODIS should be promoted alongside health and hygiene as an alternative to consuming untreated water.
- Leading by example creates a demand for and trust in the method.
- It is most effective to promote SODIS before or during the dry season to fulfil the demand created by the hot, dry conditions, thus aiding the adoption of the technique.
- Follow-up household visits are necessary to support teaching and to clear up problems and misunderstandings.

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## Reference

- 1 Sobsey, M. D. (2002) *Managing Water in the Home: Accelerated health gains from improved water supply*. WHO: Geneva.