

SOLVING THE FLUOROSIS PROBLEM IN A DEVELOPING COUNTRY

S Rajchagool* and C Rajchagool**

Chiang Mai, Thailand

SUMMARY: Although substantial professional inputs to solve the fluorosis problem in Thailand in the last decade have not yielded satisfactory results, the output, admittedly not in material forms, includes encouraging lessons that have an impact on our way of thinking in tackling the problem. The people's awareness which is the essential initial step, then their conceptual understanding of the situation, followed by their resourceful efforts, are the keys to steering on a successful course. This essay also addresses the roles of the professionals. It calls for a reversion from the liberal orthodoxy of 'people participation' in (non-people) development to 'professional participation' in people development. It is written with the hope that our experience can be food for thought for a new, if not novel, approach in solving problems in developing societies.

Key words: Fluorosis; Defluoridator; Appropriate technology; Developing country; Approaches to development; People's aspiration/action.

THE BACKGROUND

Chronic and endemic as the problem of fluorosis has been in the northern part of Thailand.¹ But only in the last decade has it been tackled, and real

success is not in sight. It is not the technical know-how² that is the main hurdle. On the contrary, the technology works well, but still the problem remains as can be seen from the outcome of a pilot study in two villages provided with ICOH defluoridators.³ If the technology itself cannot bring about a viable solution, we need to go beyond it and it is to be argued that it is the people themselves who are decisive in successful development.

For the sake of argumentation the problem of fluorosis can be looked at from two angles: techno-medical and social. The toxicity of fluoride concentration is the former, the long duration of water consumption the latter. The approach to the former is to find ways and means to reduce the toxic content, whereas the latter is concerned with habitual use of water or way of life. The ways and means in question need to be technically efficient. But being technically sound is merely a part of the story. More importantly it is to be realized that no matter how sound the technological means are, they should be operated in the context of the people's way of life. And that is related to the whole social and cultural configuration.

THE FOLK'S AND THE HEALTH PROFESSIONAL'S DEFINITION

In some high fluoride areas of Thailand 100 % of the people have dental fluorosis.⁴ As they have been accustomed to dental fluorosis all their lives and over generations, it was not really regarded as a problem. Prior to the last two decades, when communities were still relatively isolated and the inhabitants not much exposed to outer communities, fluorosis was not seen as unnatural.⁵ If people with white teeth

Casca

So every bondman in his own hand bears the power to cancel his captivity.

Shakespeare, Julius Caesar

* *Intercountry Centre for Oral Health, Chiangmai - Lumphun Rd., Nong Hoi, Muang, Chiang Mai 50000, Thailand. E-mail: cnxsrjch@cmu.chiangmai.ac.th*

** *Department of History, Faculty of Humanities, Chiangmai University, Muang, Chiang Mai 50200, Thailand.*

happened to be around, the locals immediately noticed that they were not from their neighbourhoods.

Dental as well as skeletal fluorosis is, indisputably, considered as a problem from the medical standpoint. Ironically, however, as an endemic condition fluorosis is not emphasised in the dental and medical schools. The standard curriculum of most dental schools world-wide generally advocates the value of fluoride more than a precaution against it.⁶

As a matter of fact folk's awareness came not from medical authority but originated from social and cultural factors. The affected communities, which generally are in the rural areas, have increasingly come under the influence of urban values. The groups, whose awareness has been changed, are those with contact with others from outside. The majority of people, who are most concerned with the problem of fluorosis, are the new generations going to work or to school in towns. The visual mass media is also another source of people's awareness, since it gives "the standard of beauty". In the absence of other symptoms, it was originally taken to be only as a cosmetic problem, not a problem of health. As for skeletal fluorosis, due to its long-term consequences, it was not of immediate concern.

In the beginning people with fluorosis tried to help themselves in several ways: by the application of charcoal, the use of sandpaper and the employment of quack doctors. Sandpaper was used to erase the brown stain from tooth surfaces. A mobile "doctor" with certain elementary dental equipment went from one village to another to polish teeth for the villagers.⁵ These methods undoubtedly could be very damaging, for they could cause sensitive teeth and lead to infection. A minority with economic means seek professional dental treatment,⁷ e.g. tooth extraction, which is an unethical practice, or crown restoration which is costly. When the ICOH approached these communities and proposed a solution to fluorosis, they were extremely pleased, and eager to cooperate.²

"The ICOH defluoridator"

has been through a series of modifications. Initially we started from the general idea of the bone char recipe. Many experiments were conducted to find the appropriate formula for bone char production, on one hand and the container thereof on the other. Eventually the whole design was carried out according to the principles of appropriate technology and efficiency to reduce the fluoride content from 5 to 0.5 mg/L, i.e. lower than stated in the WHO standard. After some modifications of materials and adjustments of its practicalities, the defluoridator was put into use in individual households.⁸

THE ACTIVE/PASSIVE ROLES

The ICOH defluoridator, cf. textbox, was installed in 100 households in two villages in Chiang Mai province where the natural fluoride content in the water was between 1 to 6 mg/L. The ICOH provided the defluoridator free of charge. The project staff visited the villagers under study on a regular basis. Moreover the ICOH had trained village health volunteers to change the ready-to-use-filter bags. The bags were prepared by the ICOH and sold to the villagers at a subsidised price. In order to get villagers to use the defluoridator no special persuasion was necessary. The daily handling of the defluoridator and the periodic changing of the filter caused no problems for the villagers⁸. The twelve-month evaluation showed that more than 90

households still used the defluoridator.² It had become so popular that the people in the adjacent villages showed strong interest in obtaining the equipment or sharing the treated water.⁸ After several years the ICOH, having difficulties in producing bone char, was no longer able to supply the-ready-to-use filters. But the people still continue to use the ICOH defluoridator without changing the filter. The project, useful insofar as the scientific experiment is concerned, was not so successful in terms of villagers' health. The fluorosis problem of the new generation remains unsolved.⁹

Nevertheless the whole project was not altogether in vain. Positive results have come from an unexpected quarter. As mentioned, certain villages were enthusiastic about the idea and the method. They asked for the installation of the defluoridator at their own cost. The villagers in this community employed it wisely. They stopped its usage after the supply of ready-to-use filter bags failed. The idea of making their own bone char was not congenial to their sense of propriety, hence not acceptable. Though by itself the ICOH equipment was not of sustainable value, the villagers had acquired conceptual understanding through its utilisation. Once the rationality of defluoridation was grasped, they turned to their own resources, intellectual, cultural as well as material. In the course of trial and error they arrived at a solution and built containers to collect rain water for consumption.

According to tradition the northerners are dependent not on rainwater, but on water from wells, for household consumption.⁵ The idea of utilising rain water, though common among the people in the central plains and elsewhere, did not come right away as a natural solution to villagers inhabiting fluoride areas. Odd as it may seem, the peculiar barrier could not be attributed to the non-customary practice alone. More importantly it was due to lack of the understanding. When the insight is attained, the people themselves are better qualified to work out their own ways. However, even if a rain container is functional for the people of this village, it does not follow that it is to be applied or recommended to other villages without discretion, for it is rather expensive and it is unsuitable for traditional houses roofed with leaves. As far as this one village is concerned it is an alternative that they have adopted, and they have their own way of managing the budget. The level of community concern and folk's efforts is very clearly indicative of the folk as active actors. At present every household in this community has its own container. Dental fluorosis is no longer a problem of the new generation, all of whom now have normal teeth.¹⁰

Sociologically speaking a comparative view between the two experimental villages (Case A) and the other village that asked for the installation of the defluoridator at their own cost (Case B), is of considerable value. The approaches of the ICOH personnel were clearly different. In Case A, their approach was as implementers, while in Case B as catalysts and supporter. In the former case the villagers waited for the implementers to solve the problems for them; it was the ICOH s' job, not theirs. In the latter, the villagers were the initiators; whereas the ICOH was merely their consultant. In other words, though both of them shared the similarities of awareness and concern, the contrast lies in the roles of health personnel and of the folk. In Case A the ICOH personnel were active and the folk passive, whereas in Case B the reverse was the case. And the reversed roles of the actors determined the failure and the success in the different communities.

THE CONCEPT OF APPROPRIATE TECHNOLOGY

The rationale of the design and of the implementation of the ICOH defluoridator is based on the principles of appropriate technology. But similar to other concepts, its meaning is subject to interpretation. Strictly or broadly interpreted, however, from experience drawn from this project, the concept of appropriate technology itself could be called in question. And it is perhaps now appropriate to go beyond it and move on to a new developmental approach.

As stated, the ICOH defluoridator, considered as a working apparatus, has a functional design. And as equipment, it could be made by the villagers themselves. The major parameter lies in the material of the filter. Neither health personnel nor villagers have come to terms with bone char. The production and the supply of bone char are, in fact, the essential considerations. The Provincial Health Office, which is in charge of people's health in the provinces, did not accept it as appropriate technology. They have found it too cumbersome to produce bone char. No one wishes to produce it due to its undesirable odour. The factories which produce bone char are always boycotted by their neighbours. The villagers themselves associate its production with the practice of funeral cremation. Scientifically and technically the bone char method is not only effective, but also appropriate and it is even economically conducive. But socially and culturally it is anathema. The ICOH defluoridator has proved to be "appropriate" only for research purposes.

"Appropriate"

means that besides being scientifically sound the technology is also acceptable to those who apply it and to those for whom it is used. This implies that technology should be in keeping with the local culture. It must be capable of being adapted and further developed if necessary. In addition, it should preferably be easily understood and applied by community health workers, and in some instances even by individuals in the community; although different forms of technology are appropriate at different stages of development, their simplicity is always desirable. The most productive approach for ensuring that appropriate technology is available is to start with the problem and then to seek, or if necessary develop, a technology which is relevant to local conditions and resources¹¹.

Nonetheless one could argue that the concept of appropriate technology, applied in this case, is perhaps too strictly defined. For it takes only the technical aspects into account, whereas the broad definition, expounded by WHO, includes also the social and cultural dimensions. According to the WHO definition of appropriate technology:

These words are spoken to health personnel as the focal audience in authoritative voice with an advisory tone. It is unquestionably fine in the company of the development agencies with all their best intentions and experiences. But it implies that it is they who run the show, and the folk, the stakeholders themselves, are just the beneficiaries. Underlying the definition is the articulation of the personnel and implicitly the folk are in the back bench. As a matter of fact, it is unlikely that scientists will find what is appropriate for folk. "Culture", central in the definition, does not designate a definite meaning with consensus. On the contrary, it is an elusive term, and it involves with the whole way of life. We all consciously know, though occasionally are forgetful, that we do not have access to others' minds. Even anthropologists find it impossible to perceive "what the natives perceive".

Understanding the folk's outlook thus is a hermeneutic process.¹² How to make technology compatible with the local culture is not a matter of a get-it-right solution which is waiting to be discovered. It is a process in which all parties share at every step. That is to say, to tackle the problem from the scientific point of view is totally inadequate. The folk's point of view should constantly be regarded right from the outset. To put it in another way both the folk considerations in the field together with the scientific formulation should constitute a loyal partnership with the emphasis on the articulation of the folk. Paradoxically it may sound rather idealistic, but in point of facts it is pragmatic. The point is contrary to a rather common working method that the outcome from the laboratory blackboard or the meeting room is put to the test in the field. The introduction of bone char is an exemplary lesson of the implementation of scientific measures without a dialogic consultation in a democratic spirit between the technico-medical expertise and folk wisdom. Putting the above abstract definition against the concrete situation of our cases, one critical component absent from the meaning of appropriate technology is that it does not incorporate the stakeholder into every single phase of the decision-making process. The essence of the definition, put simply, privileges the personnel in their best endeavours to achieve the technology appropriate for the folk.

The facts and the points above perhaps could well illustrate that the WHO definition is insufficient. If the scientists tend to think for the villagers, their works will more likely be scientist-centric. The adoption of a technological design is to be openly debated and jointly determined by the villagers and the scientists side by side. Hence faith in technology as a means of curing problems needs to be unified with the consideration on villagers' value choice. Appropriate technology needs to be defined along the line of "folk-directed technology".

WHICH WAY TO DEVELOPMENT?

We see our attempts to solve the fluorosis problem not as a specific isolated case but as a case in point of developmental thinking. The term "development" has become a stock in trade in various fields of knowledge. A number of its conceptual variations, throughout the latter half of this century, have appeared and disappeared from the academic market. They have been, for example, "integrated development", "community-based development", "people-centred development", "participatory development", "alternative development", "sustainable development", and many other minor versions. The trend, conceptualised very positively, is to increasingly incorporate people into the process. But the question remains not merely 'how' in the sense of working method, but more fundamentally it is about the world outlook to development which underpins the way of thinking.

Development, in the case of our solving fluorosis problems, requires the comprehensive concerted efforts of various contributors. They range from the international organisation such as WHO, the national health ministry, the state administrators under different authorities, health personnel, scientists and, last but not least, the folk. Each contributor has her/his respective function. The success story entails that 'the last in the list' must not, as commonly taken, be directed but they must direct their own course. This 'folk in command' outlook does not mean that we are to go to the extreme, namely by holding the people to be supreme and ultimate which is commonly advocated among some variations of populism. The roles of

professionals should be conducted in such ways as to be supportive of people's awareness and actions.

The liberal version of the orthodoxy of development has rendered one of its key concepts popular. It is the slogan of 'people participation'. Admirable as it may sound; however, with hindsight of our experience, our thinking points in another direction. That is, if the people's aspiration, the actual determinant in change, is to be articulated, probably a reversal in thinking is called for. The questions regarding the development for people and not for professionals then are: in place of 'people participation', should it not be 'professional participation'?. And should the technocrat/scientist not know her/his place so as to be not on top but on tap?

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