

## Control of Schistosomiasis in the Gezira

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A. A. El Gaddal

Manager, Blue Nile Health Project  
Wad Medani - Sudan

### SUMMARY :

For the control of schistosomiasis in irrigated agricultural schemes, the inhabitants must have:-

- 1) Enough potable water.
- 2) Latrines.
- 3) Proper health education to motivate the community to participate in the control.
- 4) Proper diagnostic facilities.
- 5) Proper available chemotherapy.
- 6) Focal mullusciciding.
- 7) If possible trial of biological and environmental methods of control.

Following the above methods, we could reduce the prevalence of schistosomiasis from over 50% to about 13%.

The important achievement, is the improvement of the health of the community; therefore more production and reduced morbidity and mortality.

### 1. INTRODUCTION :

There is no proper schisto control department in the Sudan within the Ministry of Health. The only proper schisto control activity is in the Gezira irrigated area. The Blue Nile Health Project is the responsible body for the control of water-associated diseases (Malaria, Schistosomiasis and Diarrhoeal Diseases) in the Gezira irrigated area.

The New Halfa Scheme, has started to apply the strategy of the Blue Nile Health Project for the control of the three diseases.

We are trying to convince the Ministry of Health to make it a rule and impose the law that all irrigated agricultural schemes must allocate a certain percentage of its income (2%) for the control of water-associated diseases (Malaria, Schistosomiasis and Diarrhoeal Diseases).

Schistosomiasis is far more prevalent in these irrigation agricultural schemes than in other places. By doing this, we hope to do some kind of control for this debilitating killing disease.

### 2. THE BLUE NILE HEALTH PROJECT :

The Blue Nile Health Project started as a joint venture between W.H.O. and the Government of the Sudan in 1980. The project life was supposed to be ten years; the first 5 years for research aiming at reaching a strategy which could be applied to the rest of the Gezira Project. The strategy is supposed to be applicable, not costly, practical and within the resources of the country. Environmental measures as well as Biological Control methods should be tried.

The aim of the project is to control malaria, Schistosomiasis and Diarrhoeal diseases. To reduce the prevalence of malaria to below 2% and schistosomiasis from above 50% to below 10% and reduce mortality and consequently morbidity due to diarrhoeal diseases and maintain them at that level.

Annual assessment of the programme is undertaken by the Scientific Advisory Group who meet once every one or two years to review the plan of action, budget, progress of work, research activities and advise on new matters. The same is done by the National Coordination Committee.

A. OBJECTIVES :

The overall objective of this project is to control and prevent the major water-associated diseases in the area through a comprehensive programme of disease prevention and control and to assess its health and socio-economic impact.

B. METHODS :

The methods used for the application of the approved comprehensive strategy include:-

- a. Provision of abundant safe water supply (deep bore wells - shallow wells with hand pumps - Horizontal Flow Roughening slow sand filters (H.F.R./S.S.F.)).
- b. Health Education with the aim of community participation and formation of village health committees.
- c. Use of pesticides and drugs.
  1. Molluscicides for snail control (Bayluscide).
  2. Residual Insecticides for malaria control (Fenitrothion) and larvicides (DIMILIN).
  3. Use of antimalarial as well as antibilharzial drugs (Praziquantel for schisto).
- d. Provision of O.R.S. or teaching mothers how to make it locally.
- e. Provision of trained personnel to work in the established diagnostic laboratories for malaria and schisto.
- f. Training of water caretakers from the villages (volunteers) to look after and maintain the water systems.
- g. Persuasion of the people to construct their own pit latrines and provide them with the enforced concrete slabs for the pit latrine at a nominal price.
- h. The use of carts pulled by donkeys for the collection of garbage and ultimately burning it.
- i. Elimination of mosquito breeding places by volunteers.

3. CONTROL OF THE SCHISTOSOMIASIS IN THE GEZIRA :

I would like to elaborate on the methods actually applied for the control of schistosomiasis. The Gezira is being divided into 5 sectors to be covered in 5 years starting 1987.

The coverage of the whole area seems to be slow because provision of potable water to all the inhabitants takes a long time. The agreement with the World Bank (Gezira Rehabilitation Fund) was in line with the timing shown on the attached coloured map.



Nº1 Drawing clean water from a shallow well by a hand pump.



Nº2 Transportation of concrete latrine slabs from the slab factory for distribution to the villages.



Nº3 Garbage collection in the village and disposal by a donkey-cart (cheap applied technology).

The strategy which we are following consists originally of four phases:-

- a. Preparatory phase
- b. Intervention phase
- c. Consolidation phase
- d. Maintenance or surveillance phase

a) Preparatory Phase

The aim was first to gain a thorough knowledge of the particular area.

1. Detailed mapping of the area, plotting each house and each body of water (to define water contact sites).
2. Demographic census listing the age, sex, occupation, place and time of previous residence, duration of permanent residence.
3. Random selection of the 20% sample size; more detailed census of the residents included in the sample (parasitological census).
4. Parasitological examination of persons included in the sample (one stool sample examined by the modified Kato method and 10 ml. of urine examined after centrifugation).
5. Health education was immediately implemented and an active methodology was developed, seeking community participation through village health committees.
6. Snail breeding sites were studied for species of snails present, presence of infected snails and epidemiological assessment (proximity of human dwellings and human activity).

Breeding sites of epidemiological significance were monitored monthly for snail density, in order to identify the seasons of maximum and lowest risk and properly time the attack phase.

Training of personnel takes place here.

b) Intervention Phase

1. Intensive health education campaigns and motivation of village health committees.
2. Chemotherapy using praziquantel:
  - a. Mass chemotherapy if prevalence is above 40%.
  - b. Treatment of positive cases only if prevalence is below 40%.
3. Focal mollusciciding of the identified contact sites usually preceded the chemotherapy campaign using Bayluscide.
4. Provision of safe water supply and sanitation were supposed to precede all the above activities and to have a community based approach. Proper time of intervention required maximum concentration of resources in the Study Zone so that complete coverage could be obtained in the shortest possible time.

c) Consolidation Phase

The aim was to find the breaking point of transmission ecosystems still resistant to control.

- Motivation of village health committees to encourage community participation.
- The snail population is monitored and focal mollusciciding is applied monthly in the identified contact sites plus updating of contact sites.
- Positive cases are treated or retreated (those who were absent during chemotherapy campaign were referred by village health committees to receive treatment) besides cases detected by the newly established laboratories by passive case detection.
- It may be discovered that an epidemiologically significant snail breeding site is being neglected in one area or the molluscicide was not properly applied or that weeding is indicated.

Study of human ecology may reveal that a small bridge for pedestrians might be the solution or that a handpump, piping system, or any safe water supply source and latrines are necessary.

Migrant carriers, mainly cotton pickers, may have entered some areas and surveillance may be required to check newcomers.

Finding the breaking point of such stable ecosystems is imperative and should replace the indiscriminate repetition of chemotherapy.

#### d) Maintenance or Surveillance Phase

The surveillance phase will be the responsibility of the local primary health care network. Focal mollusciciding on a monthly basis is continued and an annual active parasitological survey of the 20% sample, followed by treatment of positive cases, is carried out in schools.

Vertical action is limited to supervision and local research activities by highly specialized staff is still going on.

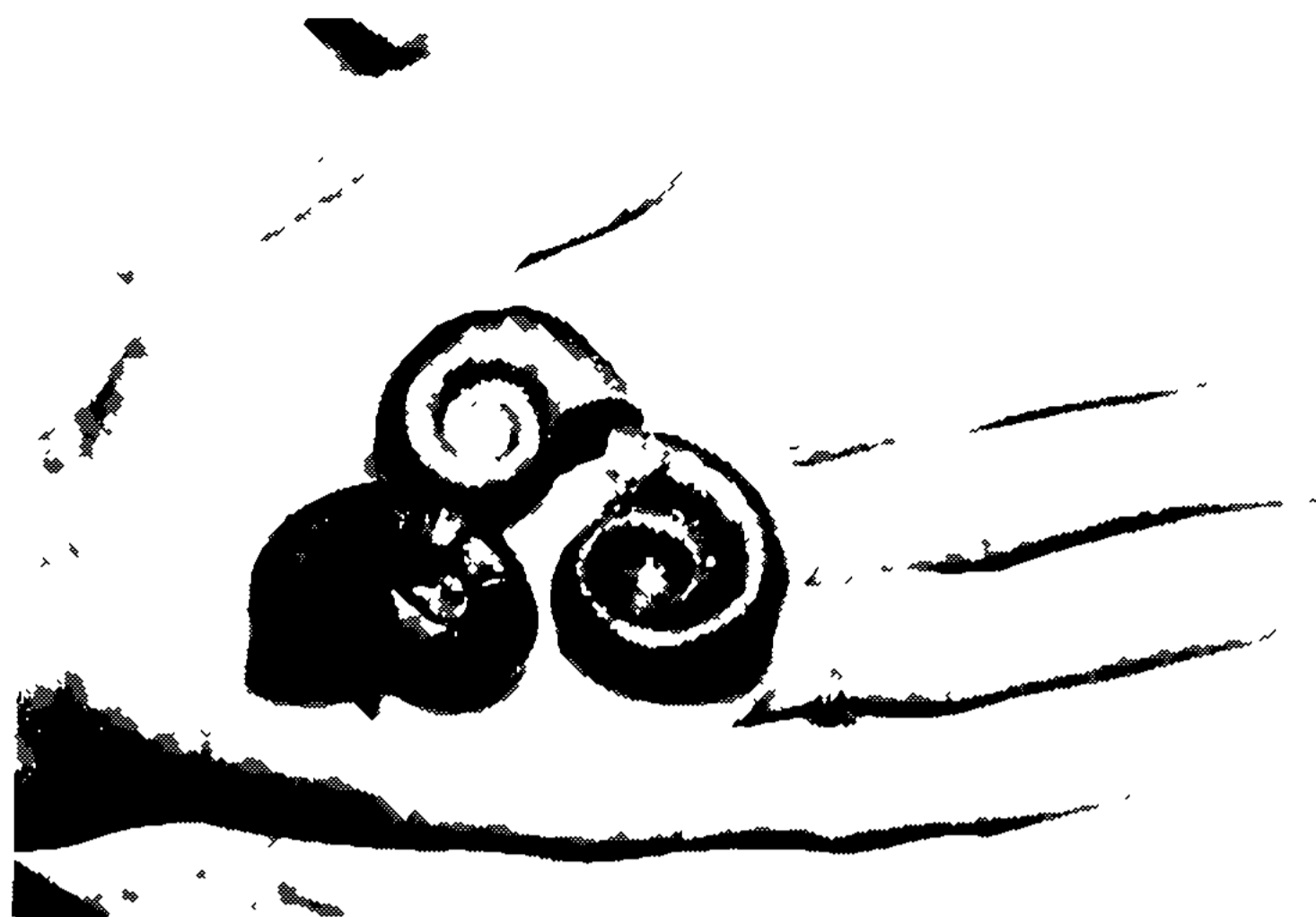
#### 4. INNOVATIVE METHODS OF CONTROL:

- a. Proper irrigation water management is going on in the Gezira, especially after the rehabilitation project.

Maintenance of canals including deweeding and desilting reduces dramatically the number of snails breeding in the canals.

#### b. Biological Control

We are now having a successful trial of the *Marisa cornuarietis* snail which we imported from Puerto Rico. It acts as a competitor and predator to the intermediate hosts of schistosomiasis in the Sudand i. e. *Bulinus truncatus* and *Biomphalaria pfeifferi*. It has shown promising results. We are trying it now on a big scale and we are very hopeful for the results.



Nº 4 Marisa snail ( Marisa cornuarietis ) imported from Puerto Rico - very successful as a biological control agent. Now tried on a big scale in the field with promising results.

5. CONCLUSIONS:

It is gratifying to mention that the results achieved so far in the Blue area are very encouraging. The prevalence of schistosomiasis has been reduced from about 50% to about 13%. Our target is 10%. We hope in the near future to go to below 10% when human behaviour towards water contact and sanitation is changed. We are concentrating on intensive health education to school children and mothers for this change of behaviour.

We are hopeful to use biological control ( Marisa cornuarietis ) for schistosomiasis in the Sudan on a big scale.

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2. Success of the Comprehensive Strategy by Dr. A. A. El Gaddal (XIITH International Congress for Tropical Medicine and Malaria, September 18-23, 1988 - Netherlands).

