SUMMARY OF DETAILED PLAN OF ACTIVITIES FOR THE

BLUE NILE HEALTH PROJECT IN SUDAN

Comprehensive Approach to the Prevention and Control of Water-Associated Diseases in Irrigated Schemes

FOR THE

INTERNATIONAL DONORS MEETING

1980
This detailed plan of activities for the Blue Nile Health Project is organized by three geographical zones: the Rahad Zone, the Gezira-Managil Zone, and the Study Zone. While the Project is designed to control malaria, bilharzia and diarrhoea, the activities are an integral programme, thus they occur in the following sequence: Project organization, management, general survey, selection of indicator sites, geographical reconnaissance and mapping, baseline data collection, intervention, evaluation, research and training, coordination, and finally reporting. Thus the list of activities, requirements, and budget are arranged in that sequence.

I. OBJECTIVES

In the Rahad Zone the primary emphasis is on early elimination of bilharzia infections in residents, to prevent transmission from occurring when the snails invade the irrigation system. Also mollusicides are held in reserve and environmental measures will be used to minimize potential for transmission, especially among seasonal labourers. Spraying of houses for mosquito control will gradually be reduced as control of larvae and treatment of infected persons progresses. Diarrhoeal disease will be reduced through improvements in community sanitation and distribution of Oralyte salts with appropriate education.

The large Gezira-Managil Zone will initially be improved by introduction of certain well-proven methods of control, by training of personnel, by repair of water supply systems, by construction of new water supplies, and by reduction in house spraying for mosquitoes as larval control measures are expanded and malaria infections decrease.

The Study Zone will be carefully surveyed, including at least a year of baseline surveys before a trial comprehensive strategy for all water-associated diseases is initiated. After 3 years of intervention, the strategy will be evaluated and expanded to the other zones.

II. PROJECT ORGANIZATION

The Management of the Project will include the Project Manager, the Co-Manager, and a Deputy Co-Manager. They will be assisted by a Director of Administration with sections on Transport, Purchasing, Personnel, Payroll, etc. As for technical supervision there will be 6 Unit Directors: for Community Participation, Statistics, Epidemiology, Engineering, Biology, and Research and Training.
III. TABLE OF CONTENTS

This Detailed Plan of Activities is organized by Zone, including an Events Chart, a List of Activities, and Requirements. The List of Activities includes separate pages showing activities leading to each Major Event:

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IV. OVERALL CHART OF EVENTS FOR TEN YEARS OF PROJECT

For the first 5 years activities will proceed in 4 parallel paths; in the 3 Zones and in Research and Training, eventually resulting in definition of the Final Comprehensive Strategy and its costs, effects and benefits. During the second 5 years this strategy will be put in operation throughout the Project Area, and expansion will be initiated to irrigation schemes elsewhere.
CHART OF EVENTS—BLUE NILE HEALTH PROJECT

START

define interim strategy

start monitoring Rahad

R7

START INTERIM INTERVENTION RAHAD ZONE

R27

start monitoring Gezira-Managil

G37 interim strategy

G20

START INTERIM INTERVENTION GEZIRA-MANAGIL ZONE

345

start comprehensive strategy

s. applied research

f. res. on control methods

A10

f. appl. research

A50

f. appl. research

A90

implement final strategy

8100

finish strategies

finish strategies

other zones

other zones

E5

EIO

FINISH

PLACE

BLUE NILE PROJECT ON MAINTENANCE STATUS

establish final strategy

establish final strategy

20

FINISH TRIAL OF COMPREHENSIVE STRATEGY IN STUDY ZONE

STUDIES IN STUDY ZONE

start general survey

START

1979 80 81 2 83 84 85 86 87 88 89 90

OVERALL SEQUENCE—1979 TO 1989
## ESTIMATED BUDGET IN DETAIL
PROVISIONAL COST-ESTIMATES IN THOUSANDS OF US DOLLARS, IN 1973 PRICES

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* Applies to all activities
** November 1978 estimates from original Plan : Revised version will be available in February 1980
V. CHART OF EVENTS FOR MANAGEMENT, COORDINATION, REPORTING AND REVIEW

The Management will establish a National Coordinating Board, an International Donors' Review Board, and a Scientific Advisory Group, each meeting annually. The National Coordinating Board and the International Donors' Review Board will consider and approve the annual budget. The Scientific Advisory Group will review and assess the scientific plan. In addition, the operations of the several provincial and national agencies will be coordinated through monthly meetings. The project senior staff will meet weekly for planning and reporting.
VI. THE RAHAD ZONE

The Rahad Zone consists of the new irrigation scheme opened in July 1978, with a population of 100,000 residents in an area eventually reaching 300,000 acres. During the cotton picking season about 50,000 seasonal workers also move into the Rahad Zone. Bilharzia transmission has not yet started but malaria and diarrhoeal diseases are prevalent.

A bilharzia survey will be made for snails and for infections in residents and migrant labourers. A bilharzia chemotherapy round will be conducted to minimize potential for transmission. An Annual Survey for malaria, bilharzia and diarrhoeal diseases will be initiated early in 1980, leading to development of an Interim Strategy for the Rahad Zone.

House spraying for malaria will continue and the introduction of larvivorous fish, improved drainage, and improved detection and treatment of malaria cases will gradually be developed. When these supportive anti-malaria measures reach an adequate level, the annual house spraying will be gradually withdrawn, beginning in those areas where the potential for malaria transmission is lowest. Eight indicator villages will be annually tested to monitor transmission of these diseases.

Rapid action is necessary for bilharzia prevention in this Zone, with the potential for avoiding thousands of new infections by treating the limited bilharzia cases existing now, in the absence of snails. Thus activities in this Zone have high priority.

Because of rapid and unexpected increases in population, extensive improvements must be made to existing water supply and sanitation facilities.
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**MAJOR EVENT:** START FIRST SURVEY
CALCULATION OF REQUIREMENTS: RAHAD ZONE: Major Event - START FIRST SURVEY

SURVEY TEAMS:

The following teams will do mapping, census, collection of diagnostic samples and snail and entomological surveys during the first year:

- mapping - 1 Jr engineer, 5 engineering asst. for 1 month
- census - 1 Jr sociologist, 2 asst. 2 months
- collect diagnostic samples - 1 clinician, 1 PHO 3 "
- examine samples - 10 microscopists, 5 attendants 3 "
- snail surveys - 1 PHO, 1 san.overseer, 10 men (quarterly surveys) 12 "
- entomology surveys - 1 PHO, 5 assistants 5 "

SURVEY FORMS:

The required survey forms, developed on a trial basis, must cover the census, malaria, bilharzia, diarrhoeal diseases, sociology, snails and mosquitoes. There will be 7 village areas monitored with about 400 households per village area. With 20 households per page, this will take 140 pages of census forms. After selection of a 10% sample of the estimated 21,000 people in 7 village areas, the epidemiological forms with 20 persons per page will require 105 pages.

MAPS:

One zone map will show major canals, Blocks and location of Villages. Block maps will show village areas and minor canals. Seven detailed maps of the village areas being monitored will show all households and fine detail of villages and watercourses. Snail and insect data will be recorded on the Block maps.

EQUIPMENT:

The following equipment will be needed for the surveys:

- stains
- glycerine
- 5000 glass slides and cover slips
- 1000 urine containers
- 2000 fecal containers
- 1000 urine filters
- 10 centrifuges
- 100 centrifuge tubes with caps
- 100 Kato apparatus
- 5 Millipore filter apparatus
- 20,000 labels for glass slides and containers
- 10 glass marking pencils
- 1 small autolav
- 1 surveyor's strings, poles and tape
- 1 set of drafting equipment
- 1 roll drafting paper
- 10 clip boards

VEHICLES:

The following vehicles will be needed permanently for the Zone office, but the 5 Station Wagons will be needed only during the annual surveys:

- 1 Station Wagon
- 1 Pick-up
- 5 Station Wagons (2 months)
## RAHAD ZONE

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<tr>
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<th>Prev. Event</th>
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<th>Month Req'd</th>
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**MAJOR EVENT:** START CHEMOTHERAPY
PERSONNEL:

For the initial bilharzia chemotherapy round, the list of registered residents must be obtained, and the residents who come from outside of Rahad must be examined. This will be completed by the survey team. However, the chemotherapy of infected persons will be carried out by the nurses at the village health units under the supervision of the Head of the Epidemiology Unit:

- 30 nurses

DRUGS:

For Bilharzia:

- 3,000 infected with *S. mansoni* = 3,000 doses oxamnique
- 500 infected with *S. haematobium* = 500 doses metrifonate

For Malaria:

- 50,000 persons - chloroquine x 10 tabs/person = 500,000 tabs
  - primaquine 100,000 tabs

For Diarrhoea:

- 5,000 children - oralyte x 2 envelopes/year = 10,000 envelopes

BUILDINGS:

The following buildings are required for the permanent Field Base: a building with 3 laboratories for malaria, bilharzia and biology plus 4 offices for Headquarters, Statistics, Engineering and Community Units. Also 1 Senior House as Guest House.

FACILITIES:

As permanent equipment the Field Base will need:

- 10 microscopes
- 5 benches and 10 chairs
- 7 fans
- 7 file cabinets
- 4 desks plus 4 chairs
- 1 refrigerator
- 3 laboratory sinks
- 1 drafting table and stool
- 3 bunsen burners
- glassware
- glass washing equipment
- electrical service
- telephone
- radio
- water supply
- gas supply
- storage cabinets
## MAJOR EVENT: FINISH INTERIM STRATEGY
CALCULATION OF REQUIREMENTS: RAHAD ZONE

**PESTICIDES:**

Until the interim strategy is implemented an annual spray round for malaria plus larviciding around towns will be continued, and reserves of molluscicides will be built up for the possibility of infestation of the system by snails. The following chemicals will be purchased yearly during this period:

- 40 Metric Tonnes of Malathion
- 300 Gallons of Abate
- 10 Metric Tonnes of Bayluscide

**PERSONNEL:**

In addition to the snail survey crew which is in readiness for mollusciciding campaign, an annual malaria round requires the following crews:

- 1 Public Health Inspector - permanent
- 1 Sanitary Overseer - permanent
- 2 Technicians - permanent
- 40 Spraymen - temporary 1 month
VII. GEZIRA-MANAGIL ZONE

This Zone is the largest of the 3 zones, including almost 2 million people and 2 million acres. In the first 5 years, following establishment of the Project Headquarters in the Provincial capital at Wad Medani, an Interim Strategy will be gradually initiated, consisting of certain simple but extensive modifications to existing disease control activities. These modifications will include:

A. Introduction of the new bilharzia drugs
B. Introduction of the new molluscicide
C. Rearing and spreading of fish for larval control of mosquitoes
D. Expansion of chemotherapy of malaria
E. Repair and Construction of Water Supplies
F. Improvement of Health Services System
G. Improvements in Irrigation System (Better communications, weed and silt removal)
H. Improvements in Agricultural Practices (Mechanical weed removal and more frequent shaping of Abu Eshreens)
I. Training of Health and Water Supply Personnel
J. More vehicles for bilharzia programme
K. Improvement of environmental sanitation

In addition careful assessment will be made of irrigation and agricultural practices to develop long-range improvements to benefit both health and agriculture. Existing efforts directed at weed control and silt removal for the canals will be increased immediately with emphasis on mechanization.
### GEZIRA-MANACIL ZONE

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**MAJOR EVENT:** START MONITORING
CALCULATION OF REQUIREMENTS : GEZIRA-MANACIL ZONE : Major Event:
START MONITORING

HEADQUARTERS:

The first step in the Gezira-Managil Zone is the establishment of Headquarters for the entire project including biology and epidemiology laboratories and data-processing centre. The Units to be accommodated at the Headquarters will require 8 offices for:

- Project Manager and Co-Manager
- Deputy Manager
- Administrative Unit
- Biology Unit (Also three laboratories)
- Epidemiology Unit (Also laboratory facilities)
- Community Unit
- Engineering Unit (Also laboratory facilities)
- Statistical Unit

Also a library, garage and storage building will be needed.

Equipment for these offices and laboratories include:

- 13 Fans
- 8 Typewriters
- 6 Calculators
- 1 Copy Machine
- 1 Stencil Machine
- 3 Telephones
- 1 Radio
- 2 Drafting tables and chairs
- Audio Visual Equipment
- 8 Sets office supplies and stationery
- 4 Air Conditioners (Epid Lab, Manager, Dy. Manager, Library)
- 9 Air Coolers
- 8 Sets Office chairs and tables
- 10 File Cabinets

HOUSING:

Permanent housing for staff and facilities for visitors will be needed as follows:

- 3 Senior Houses
- 5 Middle Houses
- 2 Guest Rooms

The Library will also require purchase of:

- Table and chairs
- Bookshelves
- Card Files
- Books
- Periodicals
The garage and engineering shop will need:

- 1 set Hand Tools
- 1 Welder
- 2 Work benches
- 1 Air compressor
- 1 Hand fuel pump
- 2 Electric Grinders
- 1 Drill Press
- Motor Oil
- Grease

The vehicles required for the HQ staff are:

- 4 Station Wagons
- 3 Pick Ups
- 2 Motorcycles
- 1 Lorry

Office personnel required for administration and Management are:

- 8 Typists
- 4 Clerks
- 2 Messengers
- 2 Sweepers
- 1 Gardener
- 3 Guards

Initially the Malaria operations have sufficient vehicles and equipment. However, the Bilharzia operations must be completely equipped with a total of 1 Station Wagon per 3 areas and 1 for the Bilharzia Operations Officer, 3 Pick-ups in each of 3 areas and 9 Motorcycles for each area, one for each Head Labourer. The individual field men will require bicycles or allowances for donkeys. Thus the vehicle requirements in the interim period, for Bilharzia, are:

- 2 Station Wagons (plus 2 existing)
- 7 Pick-ups (plus 2 existing)
- 27 Motorcycles
- 108 Bicycles
- Lorry (1 existing)

Also they will need:

- 108 Hudson Sprayers
- 27 Scales
- 108 Snail Scoops
**EPIDEMIOLOGY LABORATORY:**

The following materials are needed for the annual monitoring of 28 villages with about 200 people per village (6,000 people):

- 4 Microscopes etc.
- 5000 Glass Slides and Cover Slips
- 6000 Fecal Containers
- 1000 Urine Containers
- 10,000 Labels
- 10 Glass Markers
- 100 Kato Apparatus
- 10 Hand Centrifuges
- 10 Wash Basins
- Soap and cleaning materials

**COMMUNITY UNIT:**

This Unit will require audio-visual materials and equipment for use in all 3 Zones:

- 25 Films (5 copies of 5 subjects)
- 2 TV Shorts
- Colour Slides
- Posters
- Pamphlets
- 5 Slide Projectors AC or DC
- 5 Silent Movie Projectors AC or DC
- 2 Sound Movie Projectors AC or DC
- 12 Portable Generators or Batteries
- 2 Loudspeaker systems
- 2 Tape Recorders

**BIOLOGY UNIT:**

In addition to laboratory furniture and basic laboratory equipment the following equipment is needed for raising of fish:

- 10 Aquaria - 20L
- 10 Fish Rearing Tanks
- 2 Tank Trucks
- 5 Nets
- 5 Scales

**ENGINEERING UNIT:**

Local drainage works will be designed by the Engineering Unit, supervising community labour. Basic equipment needed will be:

- 20 Hoes
- 20 Shovels
- 2 Small earth scrapers
- 2 Surveying Transits
- 2 Sets Surveying Equipment
Also monitoring of water supply systems will require:

- 5 Water Meters (Max Cap. 100 cubic meters/day)
- 1 Set Pipe Fitting Tools
- 50 Pressure Gauges
- 50 Flow Meter and Connections (Max Cap 5 cubic meters/day)

Weeding machines will be purchased in combination with the Ministry of Irrigation and Sudan Gezira Board:

- Large Weeding Machines for Canals
- Light Bulldozers
- Small Weeding Machines for Ditches

Screening of kitchens, eating and sleeping areas and latrines will require purchase of screens and door materials:

- Screen materials
- Doors - Wood
- Doors - Hardware

CANAL MAINTENANCE:

The existing programme of manual removal of aquatic weeds from the canals will be gradually replaced with mechanical means, using tractors operating on the banks.

Silt removal operations will be increased in order to rehabilitate all the canals within 3 years. Thereafter, the rate will be reduced to a 5 year cycle.
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MAJOR EVENT: FINISH ASSESSMENTS
DRUGS AND PESTICIDES:

For the interim strategy the present funds devoted to purchase of molluscicides will be used to purchase Bayluscide. Some additional drugs will be needed for distribution in conjunction with villages cooperating in the community programme. This will involve annual purchases of the following:

- 136 Metric Tonnes Malathion
- 2.4 Metric Tonnes Abate
- 50 Metric Tonnes Fenitrothion
- 7 Metric Tonnes Bayluscide
- 40000 GMS. Oxamniqueine
- 4000 GMS. Metrifonate
- 10000 Packets of Oralyte

MICROSCOPISTS:

As part of the expansion of the Malaria case detection system, microscopists will be trained and deployed in local health units throughout the Zone, at an initial annual rate of:

- 50 Microscopists
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**MAJOR EVENT:** FINISH PROTOCOL OF INTERIM STRATEGY
WATER SUPPLY:

A major activity in the first five years in this Zone will be improvements in the existing water supply system, both in training of village plant operators and in purchase of spare parts. A second major activity will be construction of new systems, a major capital expense, to be handled by contracts, starting after 1981.

Annual needs in the first 3 years will be:

- Spare parts to repair systems
- Training of village pump operators
VIII. THE STUDY ZONE

The Study Zone includes 50,000 to 100,000 people in Blocks 26 and 27 of the Mehreiba Council, about 50,000 acres just north of Hassa Heisa.

Activities in this Zone will establish the scientific validity of the Comprehensive Strategy and will quantitatively determine its cost and its benefits. Thus preparations will be very thorough and quality of work will not be sacrificed in the interest of speed.

At least a year of pre-intervention studies will establish the existing patterns of bilharzia transmission, and the present status of malaria and diarrhoeal disease. Then a 3 year trial of the Comprehensive Strategy will be carried out throughout Blocks 26 and 27 while Comparison Areas are monitored outside the Blocks to establish the effect of the intervention.

A complete evaluation after 5 years will be the basis for expanded coverage of the Comprehensive Strategy to the other 2 Zones.
STUDY ZONE INITIAL EVENTS CHART

START GENERAL SURVEY

S1 buildings found

S2 basic supplies ordered

S4C mgr.
found

S4A ord.

S3 vehicles.

S4C
mgr.

S4A ord.

S4D
find

S4B

S4F

proposal sent to USAID

S4C
mgr.

S4A ord.

S3 vehicles.

S4C
mgr.

S4A ord.

S4D
find

S4B

S4F

S11C

S11B

S11D

S11E

S11F

S11G

S11H

S11I

S11J

S11K

S11L

S11M

S11N

S11O

S11P

S11Q

S11R

S11S

S11T

S11U

S11V

S11W

S11X

S11Y

S11Z

S12 s. biol. surveys

S13 s. water contact and health services surveys

S14 s. engineering surveys

S15 s. agric. product. surveys

S16 f. first epidem. survey

S17 f. draft comprehensive strategy

S18 f. report

S19

S20

f. epid. training

f. agric. prod. training

f. census.

f. geog.

f. comm.

f. area maps

f. training

f. geog.

f. comm.

f. area maps

f. training

f. geog.

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f. training
# Study Zone

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**Major Event:** START GENERAL SURVEYS
Because of the intensive nature of the work in the first 5 years, a fairly large Field Base is required at Abu Usher. It will include:

- 2 Offices (Zone Manager, Epidemiologist)
- 1 Laboratory for biology
- 1 Senior house for Epidemiologist
- 2 Junior Houses for staff
- 2 Guest rooms for visitors

Basic equipment for the offices and laboratories is needed:

- 1 Telephone
- 1 Radio
- 2 Desks and chairs
- 1 Refrigerator
- 1 Autoclave
- 2 Laboratory Benches and chairs
- 1 Typewriter
- 1 Set office supplies
- 1 Set Glassware
- Bunsen Burners
- Butagas
- Electricity Supply
- Water Supply

The first steps in general surveys will be preparation of maps, selection of villages, census and selection of household samples. Then annual prevalence surveys will start and monitoring of biology, human activities, agricultural productivity and water supply and sanitation. This will require the following teams:

**DIAGNOSTIC TEAM:**

- 1 Clinician
- 6 Microscopists to do 25 000 Slides/year
  
  \[
  (50 000 \text{ People} \times 20 \text{ villages} \times 20\% \text{ sample} = 5 000 \text{ people}) / 40
  \]

  3 Fecal Slides + 1 Urine Slide + 1 Malaria = 5 slides

- 3 Laboratory Attendants
- 2 Public Health Officers

**MAPPING AND WATER SUPPLY MONITORING (FULL TIME 1980, HALF-TIME AFTER)**

- 1 Engineer
- 5 Eng. Assistants
BIOLOGY: (HALF-TIME)

- 1 Biologist
- 5 Biol. Assistant

PRODUCTIVITY: (HALF-TIME)

- 1 Economist
- 5 Observer-Enumerators

BEHAVIOUR:

- 1 Sociologist
- 5 Observers

VEHICLES:

In addition to a Pick-up for the Zone Manager, a Station Wagon will be required for the Diagnostic Team with another Pick-up for the Clinician. Then also 2 Station Wagons will be shared by the other 4 Teams:

- 2 Pick-ups
- 3 Station Wagons

LABORATORY DIAGNOSTIC EQUIPMENT:

For 5,000 people or 25,000 slides, the following will be needed:

- 5,000 Fecal Containers
- 1,000 Urine Containers
- 5,000 Urine Filters
- 100 Syringes
- 10 Hard Centrifuges
- 10 Kato Apparatus
- 100 Sieves - 150 mesh
- Needles
- Detergent
- Glass-washing equipment
- Glass Markers
- Labels
- Census Forms for 20 Villages
- Diagnostic Forms for 5,000 People
# STUDY ZONE

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MAJOR EVENT: START BASE-LINE SURVEYS
INTENSIVE HEALTH EXAMINATION:

In 3 of the villages a complete medical examination of the sample population will be made requiring the following:

- 1 Clinician
- 1 Microscopist
- 3 Assistants
- 1 Mobile laboratory
- Clinical Diagnostic Equipment
- Laboratory Supplies
IX. RESEARCH AND TRAINING

A. Operationally oriented research:

Individual short-term investigations will address many of the technical questions unanswered at the initiation of this Project. These questions bear directly on operations, and are grouped by disease, or the following pages.

B. Training:

Local training will be extensive in the first year as new personnel are hired. It will continue throughout the 10 years of the Project.

International Seminars will be organized annually to inform planners and public health personnel of the Project's findings and experience.

MALARIA APPLIED RESEARCH ACTIVITIES:

1. Periodic tests for chloroquine resistance of P. Falciparum.
2. Trials of new malaria drugs.
3. Trials of serological malaria tests.
5. Evaluate dry season larviciding with Abate or others.
6. Improve larval sampling procedures.
7. Laboratory trials of safe biological agents against Anopheles.
8. Test sampling methods for Gambusia.
9. Evaluate other larvivorous fish.
10. Investigate new biological agents against Anopheles.
12. Determine human blood index for Anophelines in Gezira and Rahad.
BILHARZIA APPLIED RESEARCH:

1. Evaluate total impact of disease control on community well-being and productivity.

2. Develop simple models of disease transmission for cost-effective analysis.

3. Determine ethnic requirements for health education: seasonal labourers, registered villages, unregistered villages, and isolated families.

4. Assess available serological techniques to reduce workload: COP, RIA

5. Determine origin and transmission potential of Rahad seasonal labourers.

6. Pilot testing of innovative control methods: biological, water management, drug delivery systems, plant molluscicides and larvicides, sanitation facilities, recreation facilities, public showers, migrant camp situation, and protected canal sections for swimming.

DIARRHEAL DISEASE APPLIED RESEARCH:

1. Determine frequency and duration of episodes.

2. Determine weight gains in controlled versus uncontrolled communities.

3. Evaluate acceptance of Oralyte for each ethnic group.

4. Evaluate screens for fly control.
X. COORDINATION

The National and International Boards will annually review plans and proposed budget. A Scientific Advisory Group will also meet annually to assist the Project Senior staff. The membership of these Boards will be as follows:

A. International Review Board:

- Financial Donor Agencies
- U.N. Organizations

B. National Coordinating Board:

- Ministry of Health
- Ministry of Irrigation
- Sudan Gezira Board
- Rahad Development Corporation
- Ministry of Energy and Mining
- Universities of Khartoum and Gezira
- Tenant's Union
- Other Ministries

C. Scientific Advisory Group:

- Malaria Expert
- Bilharzia Expert
- Diarrhoeal Disease Expert
- Expert Statistician
- Management Expert
- Community Participation Expert
- Water Supply Expert
XI. REPORTING

The rapid dissemination of plans and results from this project, in Arabic and English, will be a basic activity of the Project Senior Staff, for which they will be held strictly accountable. To meet this requirement the following services and report series will be established early in the Project:

A. Codification and Computer Analysis of Data.
B. Typing, Translation and Printing Service.
C. Editorial Review Group.
D. Blue Nile Health Project Report Series:
   1. Data Records
   2. Annual Reports
   3. Research Reports
   4. Project Scientific Reports

In addition, the Scientific Staff will be mutually supported by regular and constructive criticism, in the publication of research results in local and international scientific journals.