

**REPORT OF  
THE INTER-AGENCY COMMITTEE FOR  
THE CONTROL OF VECTOR AND  
NUISANCE MOSQUITOES**

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MINISTRY OF LOCAL GOVERNMENT, HOUSING & CONSTRUCTION

REPORT  
OF  
THE INTER-AGENCY COMMITTEE FOR  
THE CONTROL OF VECTOR AND  
NUISANCE MOSQUITOS



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Inter-Agency Committee for  
the Control of Vector and  
Nuisance Mosquitos

Central Environmental Authority  
Maligawatte New Town  
Colombo 10

30 January 1987

Control of Vector and  
Nuisance Mosquitos

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## CONTROL OF VECTOR AND NUISANCE MOSQUITOS

In recent times, there have been several complaints from the public that the number of mosquitos in Colombo appear to be considerably increasing. In view of this problem, the Hon. Prime Minister decided to appoint an Inter-Agency Committee for the Control of Vector and Nuisance Mosquitos with the following terms of reference.

- a. to determine the nature and extent of the problems caused by vector and nuisance mosquitos,
- b. to assess the type, efficiency and extent of vector and nuisance mosquito control, that is being carried out by various agencies,
- c. to examine the possibilities of biological control,
- d. to fix responsibility on various Departments, Corporations, and Local Authorities and to recommend an appropriate coordinating mechanism, and
- e. to suggest ways and means of eradicating the problems of vector and nuisance mosquitos.

The following officials served on the Inter-Agency Committee :

1. Dr. R.H. Wickramasinghe, Working Member, CEA (Chairman)
2. Dr.H.M.S.S.D. Herath, Acting Director, (Environmental and Occupational Health), representing Deputy Director General (Public Health Services), Ministry of Health
3. Mr. L.S.P.J. de Silva (Assistant General Manager) representing General Manager, National Water Supply and Drainage Board
4. Mr. M.S. Fernando (Senior Engineer) representing General Manager, Sri Lanka Land Reclamation and Development Corporation
5. Mr. K.A.H. Ranaweera, Addl. Director (Policy and Planning), Ministry of Local Government, Housing and Construction
6. Mr. R. Yoganathan, Director (Coodination and Implementation) representing Director-General, Urban Development Authority

7. Dr. C.S.S. de Silva, City Microbiologist, Colombo Municipal Council
8. Mr. P. Wijesinghe, Commissioner of Local Government and Mr. K. Dharmaratnam, Deputy Commissioner of Local Government representing Commissioner of Local Government
9. Dr. C.L. Mendis, Director, Anti-Filariasis Campaign
10. Dr. P.R.J. Herath, Senior Entomologist, representing Director, Anti-Malaria Campaign
11. Dr. T. Vitarana, Director, Medical Research Institute
12. Dr. M.B. Wickramasinghe, Entomologist, Anti-Malaria Campaign
13. Dr. K.S.P. Kalpagé, Entomologist, Anti-Filariasis Campaign
14. Mrs. N. Jayasekera, Entomologist, Medical Research Institute
15. Mrs. R. Ellepola, Environmental Officer, CEA (Convenor)

It was requested that the report be furnished by the end of January 1987.

The Committee met on three occasions for discussions and also interviewed the following officials :

1. Mr. A.M. Jayasekera, Director, Inland Fisheries, Ministry of Fisheries
2. Mr. D.P.L W. Silva, Chief Education Officer, Ministry of Education
3. Dr. (Mrs) V. Jegannathan, AMOH, Dehiwela
4. Mr. Y. Wimalasena, PHI, UC Kolonnawa
5. Mr. K.H.J. Perera, PHI, UC Wattala

### Introduction

Considerable work has been carried out in Sri Lanka on the identification of the species of mosquitos found in the country. So far about 135 species have been described. The large majority of these are probably not vectors of human disease.

Some human diseases which occur in Sri Lanka are transmitted by mosquitos. Malaria is transmitted by certain species of Anopheles mosquito (mainly Anopheles culicifacies) and urban filariasis by Culex quinquefasciatus. Dengue and dengue haemorrhagic fever are transmitted by Aedes aegyptii/albopictus and Japanese encephalitis by Culex tritaeniorhynchus and possibly other Culex species. It should, however, be noted that a suggestion has been made that the virus responsible for the disease, Aids, may be transmitted in tropical Africa by insects, while the vector for yellow

fever, Aedes aegyptii, is already present in Sri Lanka. It should also be noted that animal diseases may be transmitted by mosquitos and pigs and birds may be carriers of the organism responsible for Japanese encephalitis.

The variety of mosquito species present in Sri Lanka must be kept in mind when considering the problem posed by nuisance mosquitos. At present organised mosquito control programmes are only in respect of mosquitos which transmit malaria and filaria. The control of the adult Anopheles female mosquito (which transmits malaria) is by the residual effect of malathion sprayed on to its indoor resting sites, while the Culex mosquito (which transmits urban filariasis) is controlled by treating the breeding sites with fenthion to kill larval stages.

The control of the malaria mosquito was previously effected by spraying DDT. However, the mosquitos have developed resistance to DDT and the much more expensive insecticide malathion is presently used. Malaria control work through out the island requires approximately five million pounds of the chemical costing some 150 million rupees annually. Another chemical, fenitrothion, is being kept in reserve in case the mosquito develops resistance to malathion. In Sri Lanka, the use of malathion has been reserved for the malaria control programme in order to delay the onset of appearance of malathion resistance in the malaria mosquito. However, it has been reported that malathion is available unofficially for retail purchase in rural areas and is popular for use against agricultural pests.

Indiscriminate use of pesticides can hasten resistance development in mosquitos. Additionally, indiscriminate use of pesticides and other toxic chemicals together with industrial pollution etc. may lead to the death of fish and other animals which feed on mosquitos and their larvae.

#### Causes of increase in the mosquito population

There are several possible causes for the increase of mosquito populations. For instance, in gem mining areas accumulations of water in abandoned gem pits provide ideal breeding places for some types of mosquitos. Estimates have been made that the numbers of abandoned gem pits in the island may be in the order of several hundred thousand.

As mentioned above, pollution may be eliminating natural predators of mosquitos and their larvae. Irrigation development projects lead to increase in the availability of potential breeding sites, for example when new areas are brought under paddy cultivation. Again, drought conditions may result in the formation of stagnant pools in river beds.

However, it is the view of the committee that, in large measure, the increases in mosquito population currently being experienced in Colombo and the suburbs are due to increasing urbanization. This includes factors such as 1) excavations for construction work, 2) collection of water in gardens etc., 3) the increased number of discarded receptacles for water such as coconut shells, tins, rubber tyres etc., 4) blocked rainwater gutters, 5) damaged septic tanks and 6) damaged or blocked stormwater drains etc.

It should be noted that a) the time a mosquito spends in its larval stage is usually only about seven to ten days and b) different species of mosquitos have different requirements as regards breeding sites. For example, the filaria mosquito breeds in polluted water such as septic tanks, while the dengue-transmitting mosquito breeds in relatively clean water collections such as found in discarded receptacles, rainwater gutters or flower vases. Again, while dengue is a town problem, Japanese encephalitis is essentially rural and paddy fields are a breeding site for the vector mosquitos.

It may be noted that even in the relatively small areas of the suburbs of Colombo there were differences in the major mosquito breeding sites within each area. In Kolonnawa, a large portion of the mosquito breeding sites were attributed to cesspits and bucket latrines. In Wattala about 30% of the area is a marsh which favours mosquito breeding. In Dehiwela-Mt. Lavinia it was noted that there has been considerable damage and obstruction to drains due to increased construction activities and that the existing drainage system was inadequate due to increased urbanization.

#### Non-chemical methods of mosquito control

The committee was of the view that due to the factors described above, it was not advisable or even feasible to control the nuisance mosquitos with programmes relying on the spraying of chemicals. Since mosquitos breed in a variety of sites ranging from septic tanks to flower vases, reliance on pesticides to control nuisance mosquitos would require huge



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quantities of chemicals and considerable manpower to carry out such a programme. Introduction of such large quantities of pesticide to the environment would have damaging effects as well, in addition to the considerable cost involved. The effectiveness of the chemical, monoxci, is also controversial.

The section on "Recommendations" includes discussion of steps to eliminate breeding sites and of the use of fish which feed on mosquito larve (larvivorous fish). However, some other possibilities of non-chemical controls are mentioned here for the sake of completeness.

1. Biological agents which are being researched internationally for the control of mosquitos are many and include,
  - a. Virus diseases (including nuclear polyhedrosis viruses, cytoplasmic polyhedrosis viruses, mosquito iridescent viruses, "tetragonal" viruses and others).
  - b. bacterial agents (including Bacillus thuringiensis H-14 serotype and Bacillus sphaericus, which have been the subject of researches in Sri Lanka and may be suitable for the use against mosquito breeding in certain specific sites.)
  - c. protozoan diseases of several kinds
  - d. fungi (such as those from the genera Coelomomyces, Lagenidium, Culicinomyces, Entomophthora, Beauveria and Metarrhizium) and
  - e. mermithid nematodes, such as Diximermis peterseni and Romanomermis culicivorax.
2. Insect control methods are sometimes based successfully on using sterilization by radiation or certain chemicals. While such operational techniques could be valuable with other types of insects, its operational applicability for the control of mosquitos in Sri Lanka under field conditions is controversial.
3. Use of electronic gadgets which emit sounds at particular frequencies, vapour generators, repellent chemicals etc. were not considered in detail by the Committee since they do not resolve the problem of the increasing number of mosquitos and would be costly for the poorer sectors of society.

#### 4. Personal Protection

The use of mosquito nets and the mosquito-proofing of buildings and houses, where possible, is an effective and environmentally safe protection against mosquitos.

The committee noted that for practical purposes only larvivorous fish, Bacillus thuringiensis, environmental management and personal protection measures may be available for operational use at the present time.

#### Recommendations

The Committee is of the view that efforts for the control of nuisance mosquitos should be organised on several fronts. Far more attention should be paid, than is the case at the present time, to the prevention and elimination of the breeding sites of mosquitos. In this effort the participation of the public is essential, both for cost and other reasons. Additionally, the control of vector and nuisance mosquitos in Sri Lanka is not a programme that can be accomplished in a limited operation and then discontinued but has to be maintained by on-going continual efforts to keep breeding sites to a minimum. It was noted that Singapore has stringent laws and heavy penalties for use in the enforcement of mosquito control measures.

The programme of action should preferably be centrally co-ordinated but could be divided into the following categories.

1. The responsibilities and role of the local authorities,
2. The role of the Ministry of Health,
3. Community participation,
4. The role of other governmental and non-governmental organizations.
5. Funding

#### 1. Local authorities

The continuing urbanization in different parts of the country will continue to place responsibility on local authorities for the control of the mosquito breeding sites, which come under their purview. In addition to taking steps in matters such as cleaning out blocked drains etc., local authorities should examine existing problems in their areas of responsibility and attempt to correct existing deficiencies.

For example, it was reported to the Committee that there were inadequacies in the existing schemes by the local authorities and the Health Department for the connection of toilets to the sewerage system or for the conversion of bucket latrines into water-sealed pit type systems respectively. It was felt that the present subsidy of about Rs. 300/- for the conversion of bucket latrines should be increased to about Rs. 700/- or more. It was reported that the actual cost is about Rs. 2000/-.

It is recommended that the Commissioner of Local Government and the Ministry of LGH & C should co-ordinate the work of the elimination of mosquito breeding sites by local authorities. In this connection, a questionnaire should be prepared and forwarded by the Commissioner of Local Government to the local authorities for completion as to the various problems experienced locally. In addition to collecting information on the difficulties experienced, this form should have the effect of focussing the attention of each local authority on the mosquito breeding sites within their jurisdiction.

It is recommended that this collection of information on matters connected with mosquitos be made the responsibility of a designated officer in the Dept. of the Commissioner of Local Government or the Ministry of Local Government, Housing and Construction. Local authorities and the public should be informed about the availability of this officer for consultation or co-ordination of action with respective to this aspect of mosquito control.

## 2. Ministry of Health

The Anti-Malaria Campaign and the Anti-Filariasis Campaign function under the Ministry of Health.

In addition to the work performed by the above two campaigns, it is recommended that Public Health Inspectors should be made more aware of the problems posed by nuisance mosquitos and those involved in the transmission of other diseases, such as Japanese encephalitis and dengue fever. Public Health Inspectors should, through the Ministry of Health, inform the Mosquito Control Programme Officer in the Department of the Commissioner of Local Government, when there are

local governmental problems in respect of mosquito breeding sites. The surveillance programme against Japanese encephalitis and dengue coordinated since 1980 by the Medical Research Institute should be supported and extended.

3. Community participation

An intensive campaign should be launched to invite public participation in mosquito control work. In particular, attention should be focussed on public participation in the prevention and elimination, as far as possible, of mosquito breeding sites. The assistance of institutions such as the Local Leaders Training Centre at Embilipitiya could be sought in such programmes. The assistance of private sector firms in publicity programmes would facilitate such a campaign and efforts should be made to obtain their involvement.

Radio, television, newspapers, schools educational services etc should be utilised for the public awareness programmes.

4. Other governmental and non-governmental organizations

Ministry of Fisheries -

The Department of Inland Fisheries of the Ministry of Fisheries has assured its co-operation in measures to promote the use of larvivorous fish for the control of mosquitos. The following kinds of fish have been suggested for consideration in this programme.

- a. Guppies
- b. Aplocheilus and
- c. The young of certain food fish such as species of carp, gouramis and tilapia.

With the assistance of the Department of Inland Fisheries, fish breeding programmes could be undertaken by local government bodies like Pradeshiya Sabhas and Gramodaya Mandalayas and through them by the Development Councils. The guppy is a common aquarium fish which was introduced into the country and is now found wild in many localities. A brief investigation in Colombo indicated that prices charged in local aquaria range from Rs. 2 to 25 per pair of guppies. It is considered that the high prices could be reduced by a suitable breeding programme and school children could also be encouraged to participate in this programme.

### Other governmental organisations

Other governmental organisations whose assistance may be sought in the development and implementation of specific mosquito control programmes could include -

1. Ministry of Education
2. Ministry of Agricultural Development and Research
3. Ministry of Lands (Water Management Division)
4. Ministry of Health
5. Mahaweli Authority of Sri Lanka
6. State Gem Corporation
7. Irrigation Department
8. Land Reclamation and Development Corporation
9. District Environmental Agencies

Research or other programmes relevant to mosquito control by government organisations, such as that of the City Microbiological Laboratory of the CMC should be supported and, where necessary, extended.

### Non-governmental organizations

The assistance of non-governmental organizations would be most helpful in an anti-mosquito campaign and should be vigorously sought.

The Sri Lanka Women's Conference, the Seva Vanitha Movement, the Sri Lanka Girl Guides Association, the Sri Lanka Scout Association, the Sarvodaya Organization and the Rotary Club are organizations which have already indicated their interest in assisting such a campaign. The assistance which can be rendered by non-governmental organizations include the following aspects :

1. Community cleaning campaign (Environmental Sanitation)
2. Educational programmes such as lectures
3. Distribution of promotional material islandwide.

### 5. Funding

Funding sources for the programme may be sought from appropriate agencies.

### Action Plan

1. Appointment of a Mosquito Control Programme Officer within the Ministry of LGH & C. Of preference, this officer would, at least in the first three years, devote his full time to the programme, and should be of a suitably senior level of appointment. His duties would include the co-ordination and implementation of all aspects of mosquito control, outside those which are covered already by the Anti-Malaria Campaign and Anti-Filariasis Campaign. He would liaise closely with these two campaigns and the Ministry of Health, Ministry of Fisheries, non-governmental organizations and all other relevant organizations.
2. A Mosquito Control Committee should be constituted which could meet once a quarter in the first year and, perhaps, less frequently thereafter. The Committee should receive the report of the Mosquito Control Programme Officer, be acquainted with difficulties being experienced in mosquito control work and give assistance when necessary.
3. A group should be convened of entomologists experienced in mosquito control who could advise the Mosquito Control Programme Officer in his duties, and also report to the Mosquito Control Committee at its meetings. Some funds would be needed to be made available for the work of this group. In the activities of this group, could be included research investigations into the mosquito problems found in Sri Lanka in areas such as methods of evaluation of the success of the nuisance mosquito control programmes. The meetings of the group should also be attended by the Mosquito Control Programme Officer.
4. A group should be established to implement the programme of the use of larvivorous fish in mosquito control. This group should also report to the Mosquito Control Committee and should include the Mosquito Control Programme Officer.
5. Two groups (one for dengue and one for Japanese encephalitis) should be formed with the Director (MRI) acting as convenor to plan, coordinate and implement suitable control programmes on a national scale for the control of vectors of dengue and Japanese encephalitis.

These groups should liaise with and present their regular reports to the Mosquito Control Committee.

6. A group should be established to develop and implement the public awareness programme. This group should include representatives from the Anti-Malaria Campaign and Anti-Filariasis Campaign and the Mosquito Control Programme Officer. Representatives from non-governmental organisations and social scientists could attend the meetings of this group as members or observers, as appropriate.
7. A group should be established to develop and implement appropriate water management programmes. This group should include the Mosquito Control Programme Officer and officials from appropriate governmental bodies such as the Mahaweli Authority of Sri Lanka, Irrigation Department and Department of Inland Fisheries.
8. One of the earliest duties of the Mosquito Control Programme Officer should be to review legislation relevant to mosquito control measures and draw up revisions which may be necessary.

Implementation procedures for legislation relevant to mosquito control should be prepared. Action may be taken under available Local Government Legislation, the Nuisance Ordinance etc. A system of deterrent spot fines enforced by teams of officials drawn from relevant agencies should be prepared. Local authorities should also be educated to prosecute persistent offenders.



## Annexure A

### Control of Vector and Nuisance Mosquitoes

This had been a function of the Central Government as well as Local Government in this country.

Operations for the Central Government are carried out by the Department of Health Services with the assistance of the Anti-Malaria and Anti-Filariasis campaigns, the two diseases caused by the Mosquito.

Control of this mosquito menace by Local Authorities is confined to urban areas and is undertaken by Municipal Councils and Urban Councils. This is especially so among coastal areas where there is high incidence of Filariasis.

#### CONTROL

Control activities take mainly the form of -

- (a) Preventive measures, and
- (b) Curative measures

Preventive measures include the provision of proper drainage with a well maintained environment, and spraying operations wherever possible.

Curative side at best is lukewarm or almost non-existent in local authorities, excepting testing of blood or similar operations. Central Government provides facilities for curative activities.

#### PROBLEMS

- (1) Lack of funds to control this nuisance
- (2) Low priority given by local authorities towards this problem
- (3) Trained personnel not available with Local Government Institutions to carry out operations pertaining to this nuisance.
- (4) Lack of support from the people.

#### SUGGESTIONS

- (1) More funds should be made available to the local government sector especially to activate programmes and to purchase necessary equipment, implements etc. for spraying insecticides.

- (2) Creating an awareness in the local authorities and their Heads, of the importance of this matter in relation to the health of the community and to request them to give priority attention to this matter.
- (3) Promote and ensure Community participation in the various programmes conducted by both Central Government and Local Government Institutions to control this Mosquito menace.
- (4) Training facilities should also be extended to officers as well as Community leaders in order to ensure their support in the best possible manner.

Perakum Wijesinghe  
Commissioner of Local Government

21st November 1986.

## Annexure B

### Mosquito Control in Relation to Filariasis

#### 1. Introduction

Filariasis is an insect vector borne parasitic disease. In Sri Lanka there is only one Filarial worm by and large, which infects man, and only one species of mosquito capable of transmitting this disease. This mosquito is Culex quinquefasciatus.

This mosquito requires highly polluted collections of water to breed, such as water found in blocked drains, defective septic tanks, catch pits (latrine pits) cess pits etc. These collections are found in extremely congested urban habitats.

Furthermore this mosquito harbours the infection in its muscles of flight, which restricts its flight range, once infected. Therefore both the patient and the host should live in close proximity for infection to occur.

Hence an environment which is conducive to maintain the disease in the community ideally, is an overcrowded city with poor sanitary facilities.

As a result this disease gets confined to urban habitats, and as such it is more often than not referred to as Urban Filariasis.

In Sri Lanka the most urbanised zone is the South Western Coastal belt. Almost one fourth of the population of our country is in this belt. Taking the above factors into consideration one could expect to find this disease in a greater proportion here than elsewhere. This belt now has come to be known traditionally as the 'endemic' or 'filarial' belt.

#### 2. Vector Control Programme of the A.F.C.

The breeding places of the vector are treated with a larvicide (Fenthion) in a dilution sufficient to kill the larvae.

We make use of a basic scientific fact in the biology of this vector, that it requires highly polluted water for breeding.

The urban areas provide a large collection of such breeding places. To mention a few, blocked drains, defective septic tanks, catch pits and cess pits etc.

The fact that water from these sources are not used for human or animal consumption, favours the argument for larviciding still further.

### 2.1 Constraints

The escalating cost of larvicide, spraying equipment, spareparts, etc., which have to be imported is a drain on our foreign exchange. This need not be emphasized any further.

### 2.2 Health Hazards of larviciding

Apart from Health Hazards due to larvicides often mentioned time and again, I wish to place on record a situation which could arise as a result of larviciding of breeding places. Mostly in the suburbs, ground water is used for human consumption in addition to the water received from the water board. This is more so during the drought following 'water cuts'. Some of these 'wells' are not built in and are sunk haphazardly, in close proximity to cess pits etc. Seepage of larvicide into these water sources could occur and organophosphate poisoning is a possibility.

Water by tap is becoming an expensive commodity and dependance on these 'wells' is bound to increase. Great caution will have to be exercised in larviciding in the future.

### 3. Suggestions

The vector control programme in the case of Urban Filariasis is one programme, which could be managed entirely by environmental modification methods.

To make the blocked drains flow, a better surface drainage system, repairing of defective septic tanks, conversion of bucket latrines to the water seal type, are some of the priority areas.

There are many strategies of achieving this environmental modification. The main prongs of attack are 1) enlisting the

participation on the community. 2) Health Education 3) Strict enforcement of laws pertaining to Town Planning. 4) Revision of Building and Nuisance ordinances mostly pertaining to surface drainage systems.

4. The 'mosquito nuisance' & the Filariasis Control Programme

There exists a misunderstanding between the public and the A.F.C. over the 'mosquito nuisance' issue.

There are 130 species of mosquitoes identified and recorded in Sri Lanka. Fortunately only one species is responsible for the transmission of filariasis and the A.F.C. is responsible for the control of this species only. We are not a 'mosquito control movement'. It is true that mosquitoes are a biting nuisance, but at the same time it will be heartening to know that "all biters are not transmitters of disease." If all insects did transmit disease, there would not have been a single human being on earth.

5. Conclusion

The W.H.O. has indicated that there is uncontrolled, unplanned urbanization taking place in South East Asia (W.H.O. Technical Report on Filariasis No. 542). This is true of our country too. Unauthorized urbanization, with scant respect for laws pertaining to Public Health forges ahead. The community remains indifferent.

Unless there is a change in attitude of all authorities concerned, Urban Filariasis could pose a major problem in Sri Lanka.

Dr. C.L. Mendis  
Director  
Anti Filariasis Campaign

21st November 1986

Annexure C

The Control of Vector and Nuisance Mosquitoes

In considering a Plan of Action to attempt the control of these mosquitoes, the following must be clearly borne in mind.

1. At present the only organised control programmes in respect of mosquitoes are the two Specialised Campaigns of the Ministry of Health, i.e. the Anti-Malaria and the Anti-Filaria Campaigns.

These are directed at the Control of the two Diseases - Malaria and Urban Filariasis. The control of the Vector Mosquito forms a part of the Programme, and the control strategy has been developed after detailed study of the habits of each mosquito.

Control of the adult Anophilene female is by residual effect of insecticide sprayed onto its indoor resting sites, while Culex quinquefasciatus is controlled by killing the larval stages in its breeding habitat.

2. Two other Diseases where mosquito vectors are involved are Dengue/DHF and Japanese B Encephalitis. The species of mosquito involved are Aedes egyptii/albopictus and Culex tritaeniorhyncus respectively. At present there are no organised control programmes for these diseases.
3. The enforcement of statutory regulations in respect of the prevention of stagnation of water, mosquito breeding, the proper maintainance of latrines, septic tanks etc., and environmental sanitation is the responsibility of the Local Authority.
4. During the course of its Vector Control Programmes, Health Ministry staff detect and spray breeding sites of mosquitoes, but if there is no cooperation between them and the Local Authority concerned, no action can be taken to eradicate these breeding sites.
5. In the more Urbanised areas the mosquito problem is almost totally man made. Public awareness and Community participation in the prevention of breeding of mosquitoes is the only possible means of controlling the problem.

A strategy for the control of Mosquitoes can be developed by recognising and strengthening the role of the undermentioned sectors in a joint effort to achieve the desirable goal.

1. The responsibilities and role of the Local Authority.
2. The role of the Ministry of Health.
3. The Community.
4. The role of the other Governmental and Non Governmental Organisations.

Dr. C.S.S. de Silva  
City Microbiologist  
Colombo Municipal Council

30th December 1986

Annexure D

Disease Vector mosquito control

The main human disease problems arising from the activity of vector mosquitoes are Malaria, Filariasis, Dengue and Japanese Encephalitis. The Anti-Malaria campaign and Anti-Filariasis campaign have already assessed the magnitude of the problems and are engaged in a control programme with funding from the Health Ministry. These campaigns should be encouraged to obtain the cooperation of the local authorities, the community and the Government and Non Government organisations to improve their surveillance and control activities.

Unfortunately though the MRI has determined the extent of the Dengue and Japanese Encephalitis problems, identified vector mosquitoes and determined their behavioral patterns, no co-ordinated programme for the control of these vector mosquitoes has yet been developed. A major problem in controlling the vectors of these two diseases lies in the fact that intersectoral and community participation is essential for its success. Unlike in the case of Malaria and Filariasis where the bulk of the programmes can be undertaken by the Health Ministry, for the control of Dengue and Japanese encephalitis vector mosquitoes, action by the Ministry alone will be inadequate.

Dengue is basically an urban problem which is maximal in Colombo and requires the active participation of the local authority with the assistance of the community. The MRI has been conducting a study with WHO assistance since 1980 and the necessary baseline data with regard to mosquito prevalence and Dengue transmission has been collected. Together with the Colombo Municipality, the MRI is organising a pilot project to determine how best to mobilise the community to eliminate the breeding sites of the vector mosquito. Based on the result of this study, it should be possible to devise a programme to be carried out in urban areas on a national scale to minimise the breeding of Dengue vector mosquitoes. So as to prevent Dengue Haemorrhagic Fever, which is a serious health problem in Asia, it is essential that this control programme be implemented as soon as possible.

A major Japanese encephalitis epidemic occurred in 1985/1986 in the Anuradhapura and Chilaw districts. The MRI did a detailed study and



have identified the potential vectors, their breeding sites and determined the human and animal virus transmission patterns. Based on this, the MRI has proposed that the breeding of vector mosquitoes in the rice-fields should be reduced by (a) water management and (b) by encouraging the breeding of larvivorous fish, in addition to other measures directed towards humans and pigs. For the control of vector breeding on these lines, the active participation of the Mahaweli Development Authority, Ministry of Land and Land Development among other Institutions will have to be actively involved.

It is suggested that two committees (one for Dengue and one for JE) should be formed to plan, co-ordinate and execute suitable control programmes on a national scale for the control of Dengue and Japanese encephalitis.

Dr. T. Vitarana  
Director  
Medical Research Institute

19th January 1987.

List of publications

The completion of this report within a three month period has been considerably facilitated by the expertise available within the country as well as reports resulting from previously conducted mosquito-related research studies. A few of these reports are listed below for ready reference and to provide access to the considerable literature in the field.

Balasooriya, L.K.S.W., "Potential for mass scale production of larvivorous fish at village level for mosquito control". (unpublished) Freshwater Fisheries Stn., Dambulla, Sri Lanka 9 pp.

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