

Strengthening Environmental Management in Construction Industry to Prevent Dengue



National Dengue Control Unit

Ministry of Health, Nutrition & Indigenous Medicine

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Background and Purpose

In recent times, construction industry is booming in Sri Lanka particularly in urban cities. This situation, has created several environmental health concerns including an abundance of mosquito breeding places in construction sites. As a result vector borne diseases such as Dengue fever has seen an exponential increase. Recent mosquito surveys have concluded that, 70% (n=3808) of inspected construction sites have water collections suitable for mosquito breeding. Further, more than 10% (n=596) of construction sites inspected in 2018, had positive dengue (*Aedes*) mosquito breeding places.

Life cycle of Dengue (*Aedes*) mosquito has four distinct stages (Figure 1). The first three stages (egg, larva & pupa) are aquatic (water) and the adult is terrestrial (air).

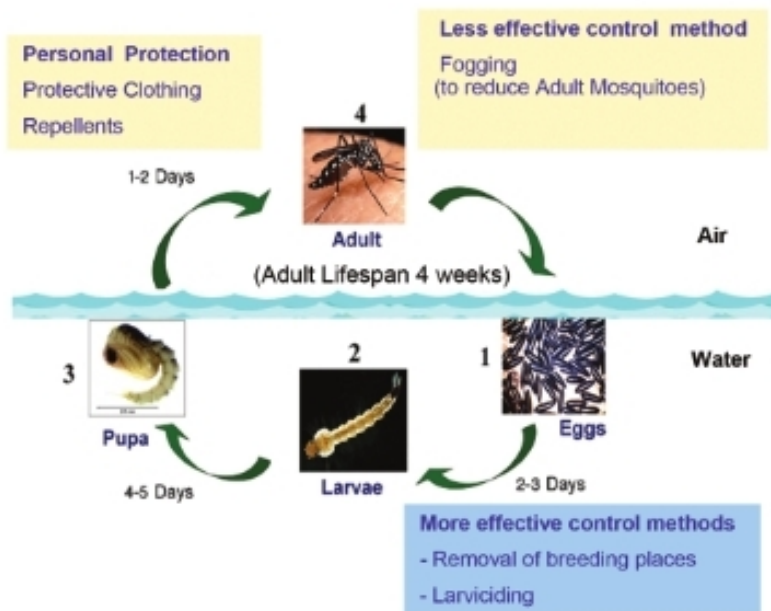


Figure 1. Life cycle of Dengue (*Aedes*) mosquito 7-10 days

In December 2018 alone several major hospitals have reported considerable number of construction site workers from Colombo Municipal Council area being hospitalized due to dengue fever (Figure 2). This is only a fraction of patients affected.

Name of Hospital	No. of reported Dengue patients from construction sites
National Hospital Colombo (NHSL)	65
Colombo South Teaching Hospital	12
National Institute of Infectious Diseases (Former IDH)	03
District General Hospital, Nuwara-Eliya	07
Teaching Hospital Peradeniya	01
Provincial General Hospital Badulla	03
Asiri Central, Colombo	08

Figure 2. Construction Site Workers with Dengue fever from CMC area reported by several major hospitals in December 2018

In this backdrop it is essential to establish and maintain a system to prevent dengue transmission in construction sites. Hence, the National Dengue Control Unit of the Ministry of Health, Nutrition and Indigenous Medicine is coordinating the development of standard **"Mosquito Management Code of Practice"** for construction industry in Sri Lanka.

All relevant stakeholders including key Ministries of the Presidential Task Force on dengue prevention (Ministry of Housing and construction through CIDA, Ministry of Provincial Councils and Local Government), Ministry of Megapolis together with Higher Education Institutes, Registrar of Pesticides, Pest Management Agencies will provide necessary support to ensure the effective implementation of these practices.

This booklet was developed and distributed to create awareness and empower stakeholders on this important national endeavor.

Common breeding places in construction sites



Stagnant water in ground floor



Stagnant water (concrete slab)



Water storage tank



Discarded tyres



Excavator backhoes



Sump pit



Discarded items



Covering items



Tower crane



Concrete test tube tanks



Lift well



Scaffolding GI pipes



Workers billets



Drainage channels

Steps to prevent mosquito breeding in construction sites

- ◆ All levels of construction sites should comply with instructions herein effectively to prevent breeding of mosquitoes.
- ◆ A dedicated programme for regular inspection and elimination of mosquito breeding places should be in place throughout entire construction period.
- ◆ Building approval issuing authorities should inform respective Medical Officer of Health (MOH) regarding proposed construction projects.

Instructions

01. Contractor is the key responsible person for maintaining mosquito breeding free environment in the construction site.

- ◆ Assign an officer and a subordinate team (site inspection team) responsible for keeping the site free of mosquito breeding.
- ◆ Train members of the site inspection team regularly on control methods of mosquito breeding according to the guidelines prepared by National Dengue Control unit (NDCU).
- ◆ Regular capacity building and training workshops to be conducted by MOH / NDCU in respective area.

02. Site inspection by the team.

- ◆ Daily site inspection should be carried out covering entire construction area, storage yard, living quarters, cooking/ washing area and toilets as explained in Form No. 01 (Page No 10 & 11).
- ◆ All mosquito breeding places detected should be removed on a daily basis.
- ◆ Assigned officer must complete Form No. 01 indicating positive and potential breeding places.
- ◆ Filled Form No. 01 should be kept filed in the site office for inspection by any authorized officer.

- ◆ A weekly update/ findings of Form No. 01 should be communicated to the contractor of the construction site.
- ◆ Consolidated monthly summary report, Form No. 02 (Page No 12) should be prepared based on Form No. 01 findings.
- ◆ All construction sites must send this monthly summary report, Form No. 02 to the respective local authority (Municipality/ Urban Council), with copies to the area MOH and CIDA.

03.Management of irremovable stagnant water collections in the site (Potential breeding place).

- ◆ Use recommended larvicides [**Bti H-14**; Bacto Bti, Bactivec, Mosquito Dunk, **Pyriproxyfen** (Sumilarv 0.5 G), **Novaluron**, **Polydimethylsiloxane** (Aquatain AMF)] in a scientific manner with the technical advice and supervision of area MOH. Refer to circular no ROP/PCS/2017/1 and ROP/PCS/2018/2 issued by Registrar of Pesticide (ROP).
- ◆ Services from a professional pest management agency (PMA) may be required for continuous application of larvicide for potential breeding places. Construction Industry Development authority (CIDA) is to coordinate and circulate information to constructors regarding the available registered PMA under ROP.
- ◆ Maintain records on type of larvicides and frequency of application.

04. Notification of suspected dengue patients (Fever patients) in the site.

- ◆ Assigned officer should inform all fever patients immediately to the MOH of the area the site is located for necessary action
- ◆ Area MOH will advise on chemical management (Fogging) and environmental management as preventive measures after confirmation of an outbreak (Circular no. ROP/PSC/2017/01)

Any construction site contradicting these instructions, is liable to prosecution by law (legal action and /or temporary closure of site)

It's "possible to keep construction sites Dengue free through the actions of dedicated and committed staff "

Tri-Forces HQ Construction Site at Akuregoda is free of Dengue mosquito breeding (NDCU Dec 2018)



Checklist for Mosquito Breeding Sites in Construction sites

Contractor:.....

Site / Project:.....

Item	Description	1 st week				
		Checked	Findings*		Actions Taken	
			Stagnant water	Mosquito breeding	Closed stagnant water	Larvicide applied
1 Construction Area						
a	Concrete or cement floors - ground / all levels					
b	Puddles - ground					
c	Building materials					
d	Demolition debris					
e	Equipment and machineries					
f	Water storage tanks, drums, containers					
g	Barriers					
h	Trenches					
i	Bulk waste containers, skips & refuse bins					
j	Sump pits/ silt traps					
k	Drains/ temporary channels constructed for drainage					
l	Vehicle wash bays					
m	Lift wells					
n	Planter boxes (concrete)					
o	Discarded items & receptacles/tyres					
2 Living Quarters						
a	Freight containers/ Sink Sheet Hut					
	i) Roof					
	ii) Ground below					
b	Plastic containers/ cooking pots & pans/ domestic containers					
c	Discarded items & receptacles					

Form No. 01

Client: Date:

Inspected by:

Item	Description	1 st week					
		Checked	Findings*		Actions Taken		
			Stagnant water	Mosquito breeding	Cleared stagnant water	Larvicide applied	Kept under shelter
3	Storage yard						
a	Puddles- ground / all levels						
b	Freight containers						
	i) Container roof						
	ii) Ground below containers						
c	Building materials						
d	Equipment and machineries						
e	Concrete test cube tanks						
f	Tool boxes						
g	Paint tins/ cans						
h	Discarded items & receptacles						
4	Toilet & bathroom						
a	Concrete floor						
b	Pails/ plastic containers						
c	Toilet cisterns & toilet bowls						
d	Bathing point concrete tanks						
e	Drain holes of unused sinks						
f	Gully/ floor traps						
5	Cooking & washing Area						
a	Cooking pots & pans						
b	Discarded items & receptacles						

Monthly report on inspection of mosquito breeding in construction sites

Form No: 2

Monthly report on inspection of dengue breeding places in construction sites.

General information

- Contractor..... ➤ Site/Project:.....
- Name of the contact person and contact number:
- Client:..... ➤ Month:.....
- MOH Division:.....

Information about site inspection and dengue cases reported

➤ Availability of a dedicated team for regular inspection of mosquito breeding places.	Yes/No
➤ Number of potential breeding places detected during previous month.
➤ Received services by pest control agency during previous month.	Yes/No
➤ If yes, Name of the agency..... No. of times the service provided
➤ MOH health team made inspection visits during the previous month	Yes/No
➤ Any warnings given / Red notice issued.	Yes/No
➤ Number of fever patients reported during previous month.

Information about the actions taken on detection of breeding places/ to prevent breeding places

Potential water collected machinery and equipment in the premises and in the vicinity was kept under a shelter	
Unused containers were stored under a shelter	
The floors, balconies, flower pots, temporary covers (polythene), concrete roofs and canopies were placed without clogging water	
Other fittings including iron / PVC pipes were covered with endcaps to prevent water collection	
Water storage containers / tanks were covered to prevent mosquito breeding and the water collecting containers were cleaned daily	
Scrub/brushed the inner surface of water collected tanks/containers at least once in three days.	
Drains and gullies were set up to flow	
Collected water in the lift wells were removed every 3 days	
Discarded material, debris and unused goods were discarded properly	
Solid waste was recycled	
The reusable or discarded tyres were stored/sand filled/pierced to prevent accumulation of water.	
Larvicides were applied to the mosquito breeding places/containers where water could not be removed	
Technical advice was obtained from the respective Medical Officers of Health	

Please send this report to local government (Municipality/ Pradeshiya Saba), MOH office of the area and CIDA before 10th of the subsequent month.

Your assistance as a construction contractor to this National programme on Dengue Prevention, is highly appreciated.

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DENGUE PREVENTION TIPS FOR FACTORY AND CONSTRUCTION SITE WORKERS...

Step 1



ශුද්ධ කරන ජලය දිනෙන් හතර දිනක් මාරු කරන්න හෝ වෙන වෙනම.

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Change the water in water storage containers every other day or cover them

Step 2



නවතා ගෙන යන ජලය ධාරිතාව මුදල් ජලය නොගැසීමේ වැඩිපුර.

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Overturn the buckets / barrels, when not in use

Step 3



වටිනාකමක් නොවන ජලය හෝ වෙනත් දෑ ඉවත් කරන්න.

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Dispose of all unwanted things left indoor and outdoor within the site

Step 4



කොන්ක්‍රීට් කැටුම්පත් ජලය හෝ වෙනත් දෑ නොමැතිව පවතින බව පරීක්ෂා කරන්න.

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Check and remove all stagnant water on concrete slabs, canvas sheets used for covering goods

Step 5



විද්‍යාග්‍රිහසාලයේ ජලය හෝ වෙනත් දෑ ඉවත් කරන්න.

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Ensure good house keeping. Clean your site and check for stagnant water

Step 6

විද්‍යාග්‍රිහසාලයේ ජලය හෝ වෙනත් දෑ ඉවත් කරන්න.

Appoint a dedicated team for regular inspections



13 EVERY ACTION COUNTS

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- වීම් සවිධාන කිරීම සඳහා වීම් සවිධාන කිරීම සඳහා
- වීම් සවිධාන කිරීම සඳහා වීම් සවිධාන කිරීම සඳහා

චලන රථයක් හා කාර්යාල සවිධාන කිරීම සඳහා වැඩ කිරීම **චලන රථයක් සඳහා සවිධාන කර්මය**

						
වීම් සවිධාන	වීම් සවිධාන	වීම් සවිධාන	වීම් සවිධාන	වීම් සවිධාන	වීම් සවිධාන	වීම් සවිධාන

- චලන රථයක් සඳහා වීම් සවිධාන කිරීම සඳහා
- කාර්යාල සවිධාන කිරීම සඳහා වීම් සවිධාන කිරීම සඳහා

• වීම් සවිධාන කිරීම සඳහා වීම් සවිධාන කිරීම සඳහා වීම් සවිධාන කිරීම සඳහා

Stakeholders for Environmental Management of Construction Sites



Complex nature of construction industry needs multi stakeholder involvement for strengthening of environmental management to prevent dengue mosquito breeding.



**WE ARE COMMITTED TO KEEP
OUR CONSTRUCTION SITES
MOSQUITO BREEDING FREE !**

National Dengue Control Unit

Public Health Complex

555/5, Elvitigala Mawatha

Colombo 05

Tel: 011 2368416 Fax:011 2369893

E mail: ndcu2010@yahoo.com