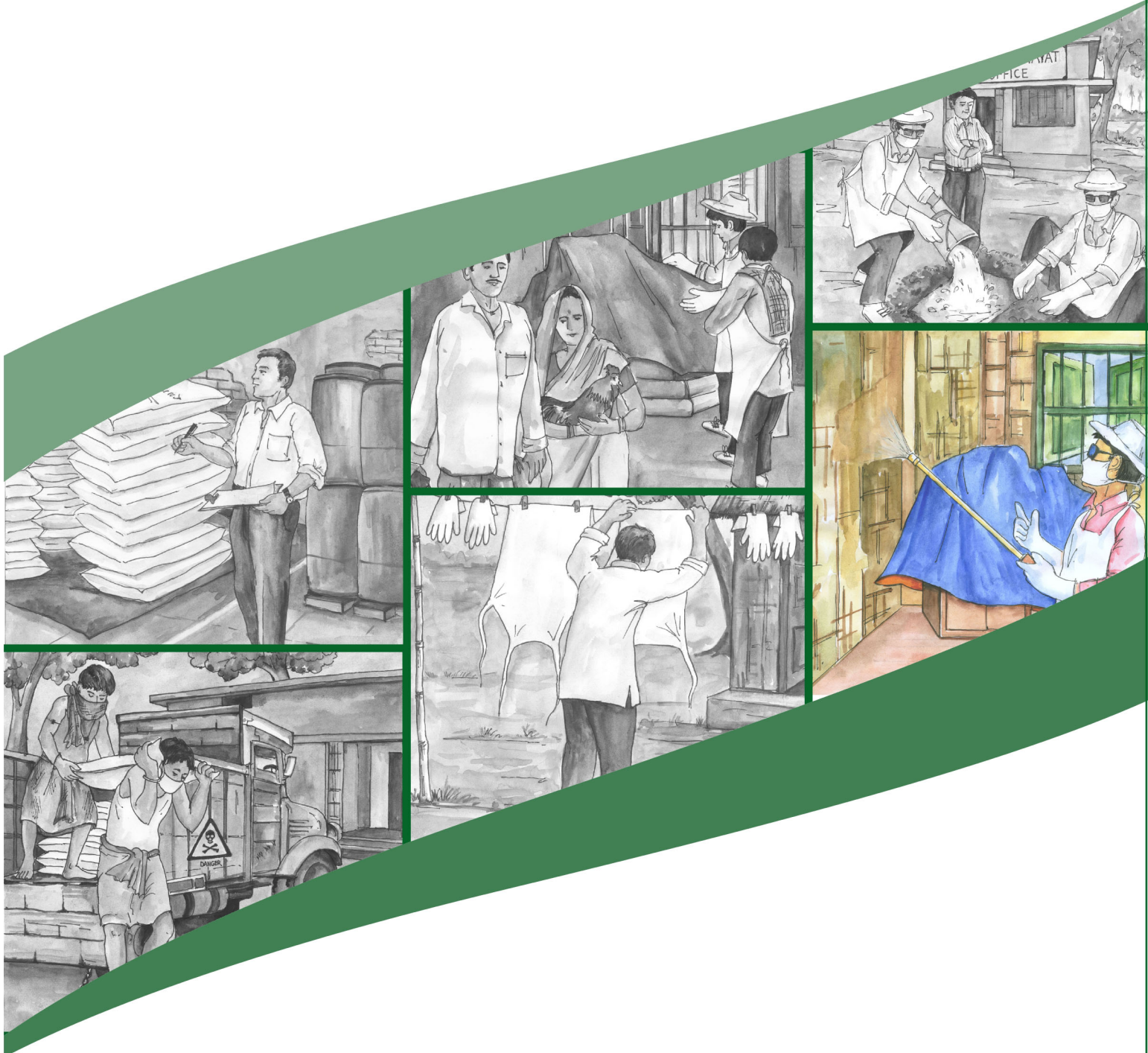


ENVIRONMENTAL CODES OF PRACTICE



Indoor Residual Spraying (IRS)

LIST OF ABBREVIATIONS

ASHA	Accredited Social Health Activist
DDT	Dichloro Diphenyl Trichloroethane
DMO	District Malaria Officer
ECOP	Environmental Codes Of Practice
IRS	Insecticide Residual Spray
KTS	Kala Azar Technical Support
MOIC	Medical Officer Incharge
MPW	Multipurpose Worker
MTS	Malaria Technical Support
NVBDCP	National Vector Borne Disease Control Programme
PPE	Personal Protection Equipment
SFW	Superior Field Worker
VBD	Vector Borne Diseases
WHO	World Health Organisation

ENVIRONMENTAL CODES OF PRACTICE -5

INDOOR RESIDUAL SPRAYING (IRS)

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Document Revision and Approval History

(All revisions must be approved. Revision and Approval can be internal source or the client)

Version	Date	Reviewer & Approver	Remarks
V.0	27 th July 2011	Avijit Ghosh	Draft for Discussion
V.1	25 th September 2011		Comments of Expert Committee incorporated
V.2	20 th March 2012		After Incorporation of discussion of National Workshop
V.3	18 th July 2012	Avijit Ghosh	Illustration of ECoP

Document Distribution List

#	Name/ Company	Purpose

ECOP 5 - INDOOR RESIDUAL SPRAYING (IRS)

1 INTRODUCTION

The National Vector Borne Disease Control Programme constantly endeavours to use alternative techniques for vector control. However, currently it still uses considerable amount of insecticides for controlling vectors. The practice of using insecticides presents potential health and environmental hazards. This Code of Practice provides practical guidance for safe, responsible and effective use of insecticides. If the provisions of this Code are followed, health and environmental hazard of community and the workers can be minimized.

2 PUPROSE AND SCOPE

This Code of Practice is aimed at all users of insecticides, i.e. spray workers and squad supervisor, in vector control programme. While vector control is the primary focus of the Code, it can also be the basis for safe and responsible insecticide use by the wider community involved in indoor residual spraying, as it covers the environmental safeguards involved in insecticide use.

3 STATUS OF THIS CODE

The Environment Protection Act 1986, Section 8 states that “No person shall handle or cause to be handled any hazardous substance except in accordance with such procedure and after complying with such safeguards as may be prescribed.” In concurrence with these policy directions and the statutory provisions, the National Vector Borne Disease Control Programme has developed these guidelines to ensure judicious use of the insecticides during the spraying activities.

4 DUTIES AND RESPONSIBILITIES

- During preparation of the spray plan, it would be the responsibility of the storekeeper to check usability of the personal protective equipment and also the effectiveness of the spray equipment. He should intimate the status to the respective MOIC/KTS/MTS/MI. The MOIC/KTS/MTS/MI has to intimate the situation to the District Malaria Office who would be responsible for arranging these requirements.
- The squad supervisor has to ensure that the spray squad uses their personal protective equipment before starting the spray operation.
- The squad supervisor should check application equipment regularly for wear, damage and leaks and ensure that they are in proper working condition according to the equipment manufacturer's specifications.
- The KTS/MTS/MI should calibrate spraying equipment before spray commences, using only water, to ensure that the correct application rate of insecticide spray mixture is available. The squad supervisor is responsible for checking the equipment every day.

- The KTS/MTS/MI should monitor output during or after application to ensure that the correct procedure is being applied.
- The spray worker should clean and maintain spraying equipment according to the equipment manufacturer's instructions and/or the insecticides product label, (which may recommend special cleaning methods). The squad supervisor should ensure that the spray workers undertake these cleaning operations.
- The squad supervisor should ensure that the spray workers clean their PPE after use and should also ensure that the workers return them after each round of spray. It is his responsibility to keep all protective gear under his safeguard after each round of spray.

5 GUIDANCE NOTES FOR INDOOR RESIDUAL SPRAYING

The guidelines which should be adopted at different stages of Indoor Residual Spraying are presented in the sections below:

5.1 PLANNING OF THE SPRAY OPERATION

- Information about the spray operations should be intimated to the community at least three (3) days before the commencement of spray activities by ASHA/Health workers.
- The condition of the personal protective equipment should be ascertained by the supervisors (MPWs).
- MPW /MTS/KTS/ should ensure that adequate number of spray equipment is available before commencement of spray. They should also test the effectiveness of the spray equipment before each round of spray.
- The effectiveness of the spray equipment should be tested with water for dripping. The supervisor (MPWs) of the squads should ensure that the pipe joining the stirrup pump and the lance have been checked for any leakage.

FIGURE 1. SPRAY EQUIPMENT SHOULD BE CHECK FOR LEAKS

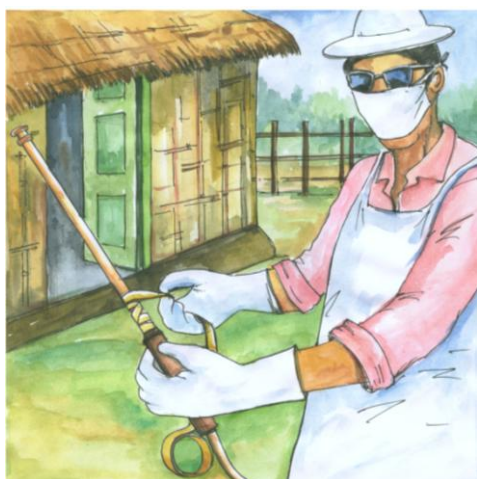
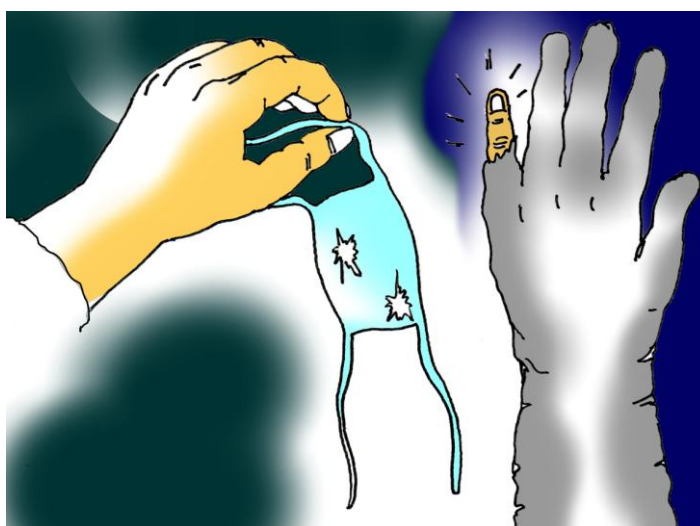


FIGURE 2. PPE SHOULD BE CHECKED BEFORE USE



5.2 GUIDELINES TO BE FOLLOWED DURING SPRAYING ACTIVITY

The following points should be considered before undertaking spraying operation in any settlement:

- The squad supervisor should identify location for staging of the spraying operation for the day. The staging area¹ should be 2-5 metres from the source of water or any other water body and agricultural field that is used for spraying activities. Multiple staging areas can be selected for larger villages.
- For the purpose of staging, plastic sheet measuring 1.0m x 1.0m should be spread on the ground. All the activities like preparation of suspension, storage of insecticides, etc. should be performed in the staging area.
- When the activities of a particular staging area is complete, the plastic used for staging should be folded upper surface inwards in a such a manner so that no chemicals spill on the ground.
- The water required for preparation of the suspension should be obtained from public sources.
- Spray workers should remove, or assist the house owner in removing, all calendars, papers, photo frames that are placed on the walls, before starting spraying operation.
- Spray workers should ensure that all food items and utensils are removed from the house where spraying operation would be carried out.

FIGURE 3. KEEP ALL ACTIVITY OF SUSPENSION PREPARATION LIMITED TO STAGING AREA

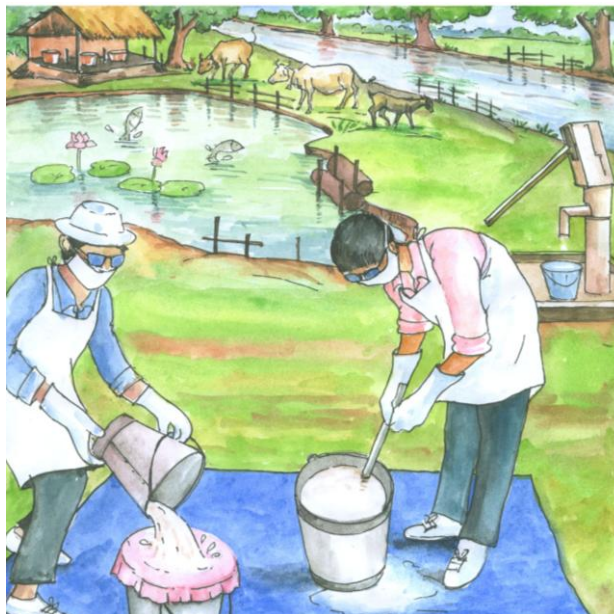


FIGURE 4. FOLDING OF PLASTIC USED FOR STAGING



¹ A Staging Area is defined as the dedicated area which is utilised for the preparation of the insecticide suspension.

- Immovable property or furniture which cannot be removed should be gathered in the middle of the room and covered with polythene sheet. Heavy furniture that cannot be moved or household items which cannot be taken out of the house should also be covered.
- A double coloured polythene sheet should be used for covering the furniture. Double coloured (blue and red or yellow and blue) polythene sheets or single coloured sheets duly marked (with cross signs) should be spread on the stockpile before spraying. The red or yellow or marked side should be the bottom surface, i.e. the surface facing the stockpile or the furniture.
- In case there is any stockpile of food grain in the house, it should be covered before spraying is carried out.
- Avoid spraying insecticides for IRS near water bodies, tube wells, drains, agricultural fields, irrigation canal, swamps, outside houses (eaves of houses to be sprayed), animal sheds, etc. Cattle sheds (only in case of kala-azar), unused rooms, granary, sericulture, beekeeping, tobacco leaves, etc should not be sprayed. This should be monitored by the Supervisor.
- The Supervisor should invigilate the spraying pump from time to time to check that there are no leaks along the lance or the pipe. He should ensure that the spray pattern is even and without streaks. Dripping and puddling should be checked and corrective measures should be taken.
- If there is clogging, the clogged nozzles should be immersed in a container with water for several hours, and then the blockage should be removed by a soft

FIGURE 5. SPRAY WORKER COVERING HOUSEHOLD ITEMS



FIGURE 6. AVOID SPRAY IN WATER BODIES



brush (a tooth brush might be used). Nozzles should not be cleared with a hard pin or a piece of wire and a nozzle should never be put into mouth for blowing air through it.

FIGURE 7. AVOID DRIPPING AND PADDLING FROM SPRAY EQUIPMENT

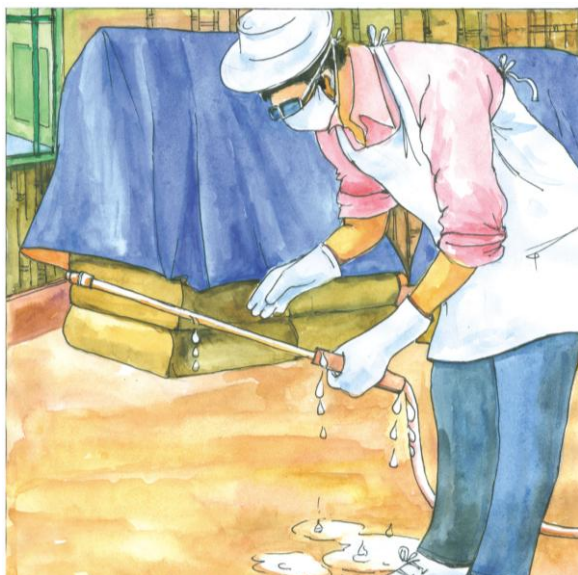


FIGURE 8. DOS AND DON'TS IN CASE OF CLOGGED NOZZLES



5.2.1 Health and Safety of Spray Workers

- All spray personnel should wear appropriate PPE² during the entire operation.
- The squad supervisors should ensure that the spray worker never works alone while applying insecticides.
- After completion of spraying, the personnel should remove the PPE and wear fresh sets of clothes before eating or drinking.

In case of poisoning by insecticides, the following antidotes should be used:

Organophosphorous (targets nervous system and is esterase inhibitor)

- In case of organophosphate poisoning, 2-4 mg of atropine should be given intravenously (for children 0.5 to 2 mg according to weight). Depending on symptoms, further doses of 2 mg should be given every 15 minutes for 2-12 hours in severe cases.

Synthetic Pyrethroid poisoning (affects every part of the nervous system)

- Vitamin E oil preparations can be given for prolonged paraesthesia. Only in cases of definite allergic symptoms, should corticosteroids be administered. On occurrence of convulsions after severe intoxication, intravenous injection of 5-10 mg Diazepam (or other benzodiazepine derivatives) should be given.

² The details of the Personal Protective Equipment are given in ECoP-4.

FIGURE 9. SPRAY WORKERS SHOULD WASH BEFORE TAKING MEALS



FIGURE 10. EATING AND DRINKING SHOULD BE PROHIBITED DURING SPRAYING OPERATION



- Eating, drinking and smoking while carrying out the spraying operations must be strictly forbidden.
- Spray operators should ideally work for 5-6 hours a day.
- If there is skin-contact with insecticides, the affected area should be immediately washed off with soap and water. If insecticide goes into the eyes, they should be immediately flushed out with plenty of water.

5.3 GUIDELINES FOR POST-SPRAY OPERATIONS

The Supervisor should be responsible for monitoring the proper washing of equipment (buckets, spray lance and stirrup pump). Progressive triple rinsing³ of the spray pumps, lance and the buckets is essential. The Supervisor should ensure that the workers wash off after a day's activity before they eat or drink.

5.3.1 Progressive Triple rinsing

Progressive triple rinsing is a procedure by which the equipment are washed repeatedly for three times with a view to economise the use of water. This is done basically by using the waste water from each wash to wash other containers/equipment. For every rinsing, the Supervisor

FIGURE 11. WASHING OF EYES IN CASE OF EMERGENCY



³ The procedural details have been elaborated in the ECoP-6 which is dedicated for disposal of waste water, bags/containers and bio-medical waste.

should monitor that not more than 2 litres of water is used for the rinsing activity. After every rinsing, the waste water should be disposed of in the pit constructed at the villages.

5.3.2 Soak Pits

A soak pit is a specially designed hole in the ground for disposing of insecticide remnant after the day's IRS activities. A properly sited and constructed soak pit protects the environment from getting contaminated with insecticides. All the wash water and excess suspension should be disposed in the soak pit

6 REFERENCES

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Illustrations taken from:

- Food & Agricultural Organisation (1996), *Insecticides Storage and Stock Control Manual*, FAO of United Nations under the project GCP/INT/572/NET available at http://www.fao.org/ag/AGP/AGPP/Pesticid/Disposal/common/ecg/103809_en_No_3___Storage.pdf (accessed on 12.07.11)
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The ECoP series also Contain:

1. Transport of Insecticides for IRS activities
2. Storage and Management of Insecticides Stock
3. Community Responsibility During IRS
4. Use and Maintenance of Personal Protective Equipment (PPE)
6. Disposal of waste water, empty bags/ Containers and bio-medical wastes



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