PacMOSSI
Pacific Mosquito Surveillance Strengthening for Impact

PAPUA NEW GUINEA INSTITUTE OF MEDICAL RESEARCH

PARTICIPANT WORKBOOK

How to Implement *Aedes* Vector Control

Version 1

PacMOSSI Regional Practical Workshop 2026
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PARTICIPANT DETAILS	
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Introduction

Welcome to the PacMOSSI Regional Practical Workshop on How to Implement *Aedes* Vector Control in the Pacific.

Workshop purpose

This workshop aims to build participants' practical knowledge, skills and confidence to plan and implement *Aedes* vector control activities using approved operational procedures, field guides, safety requirements, risk assessment processes, community engagement approaches and appropriate documentation.

How to use this workbook

Bring this workbook to each session and use it to:

- Record key learning points and important information from presentations and demonstrations.
- Complete individual and group exercises.
- Document findings from practical activities and field observations.
- Note questions for facilitators and areas where further guidance is needed.
- Identify how workshop learning can be applied in your local setting.
- Develop a realistic 90-day action plan to guide follow-up activities after the workshop.

Participate actively in discussions, practical demonstrations and group activities. Use the workbook to reflect on how the approaches and tools introduced during the workshop can support your local vector control program.

Important note

This workbook supports learning, discussion and practical application. It does not replace current locally approved Larval Source Management (LSM), Indoor Residual Spraying (IRS) or Outdoor Residual Spraying (ORS) options, SOPs, field guides, product labels or other applicable guidance.

Always follow the relevant risk assessment requirements, product instructions, locally authorised procedures and directions from authorised supervisors. Use only approved products for their authorised purposes and ensure that activities are conducted by appropriately trained personnel.

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Workshop learning outcomes

1. Describe *Aedes* mosquito biology, behaviour and disease risk in the Pacific context.
2. Identify appropriate *Aedes* vector control options and the situations in which they may be considered.
3. Use the LSM SOP, field guide, premise inspection form and daily summary form during planning and field work.
4. Assess containers, select suitable management actions and complete larvicide calculations using approved product information.
5. Communicate respectfully with households and communities and explain the purpose of planned activities.
6. Recognise the operational and safety requirements for spatial emanators, indoor residual spraying (IRS) and outdoor residual spraying (ORS).
7. Document field activities, review implementation quality and identify the next practical steps for the home program.

Creating a safe and respectful learning environment

To make the most of the workshop, we encourage participants to:

- Share experiences and learn from one another, recognising the value of local knowledge and operational experience.
- Ask questions and seek clarification whenever a procedure or safety requirement is unclear.
- Participate in practical activities while following facilitator guidance and relevant safety requirements.
- Undertake insecticide application and equipment operation only when appropriately authorised, trained and supervised.
- Respect household privacy and seek permission before inspections, photographs or other data collection.

Workshop program at a glance

Day	Theme	Main activities / outputs
1	*Aedes* control foundations and LSM	*Aedes* refresher; intervention overview; LSM SOP and forms; container management; larvicide safety and calculations.
2	LSM field implementation	RCCE roleplay; household LSM practical; debrief; field data review; 24-hour larvicide assessment.
3	Spatial emanators and residual spraying operations	Spatial emanator demonstration at Belna NATNAT Centre; IRS/ORS SOPs and safety; sprayer inspection and technique; household briefing.
4	Residual spraying field implementation	Team deployment; supervised field exercise; equipment cleaning; quality and safety review; mist sprayer demonstration.
5	Applying *Aedes* control back home	Country priorities and resources; Pacific Solutions Exchange; regional priorities; individual 90-day action plan and commitments.

Abbreviations used in this workbook

Abbreviation	Meaning
Aedes VC	*Aedes* vector control
BNC	Belna NATNAT Centre
IRS	Indoor residual spraying
LSM	Larval source management
ORS	Outdoor residual spraying
PacMOSSI	Pacific Mosquito Surveillance Strengthening for Impact
PPE	Personal Protective Equipment
RCCE	Risk communication and community engagement
RS	Residual Spraying
SDS	Safety Data Sheet
SE	Spatial Emanators
SOP	Standard operating procedure
SVD	Society of the Divine Word
WG/WDG	Water granules/Water-dispersible granules

Setting learning goal

My main learning goal for this week:

DAY 1 | Foundations and Larval Source Management

Purpose

Build a shared understanding of *Aedes* mosquitoes in Pacific Island Countries and areas, available vector control interventions, PacMOSSI support, and the LSM SOP and Field Guide.

Time	Session
08:30–09:30	Opening, introductions and workshop overview
09:30–10:30	Refresher: *Aedes* biology, behaviour, disease risk and vector control interventions
10:30–10:45	Morning tea
10:45–11:45	Introduction to LSM operational processes
11:45–12:30	Protocol Presentation: LSM SOP, field guide, and forms
12:30–13:30	Lunch
13:30–14:30	Group exercise: container/larval habitat management
14:30–15:15	Larvicides: products, safety and calculations
15:15–15:30	Mobility break
15:30–16:30	Larvicide practical: dose estimation exercises and treatments
16:30–17:00	Wrap-up and Day 2 briefing

ACTIVITY 1.1 – *Aedes* in my setting

Purpose: Connect the refresher to your local program.

What *Aedes* species or *Aedes*-related risks are most relevant in my setting?

What local environmental or household conditions can support *Aedes* breeding? *(e.g. frequent rainfall & warm temperature)*

What do I most need to understand or improve about *Aedes* control? *(e.g., Improve identification and recording of potential larval habitats and adult mosquito resting sites)*

ACTIVITY 1.2 – Choosing an intervention

Purpose: Compare key *Aedes* vector control interventions and identify factors that influence their selection.

Instructions: Complete the table using the information introduced during the session. Keep your answers brief.

1. Compare the interventions

Fill in the blanks.

Intervention	What does it target?	Where might it be used?
Source reduction and container management		e.g., water storage tanks
Larviciding		
Residual spraying (IRS/ORS)		IRS: ORS:

2. What should be considered when choosing an intervention?

Tick the factors that should inform the decision.

☐ Local surveillance findings and larval habitats
☐ The location and accessibility of target areas
☐ Availability of trained staff, equipment and resources
☐ Product approval, safety requirements and operational procedures
☐ Community participation, acceptance and cooperation
☐ Evidence that the intervention is appropriate and likely to be effective in the local setting

3. Identify one limitation or important consideration for each intervention.

Intervention	One limitation or important consideration
Source reduction and container management	e.g., requires repeated household participation and follow-up
Larviciding	e.g., only suitable for some habitats
Residual spraying (IRS/ORS)	e.g., requires trained and authorised operators

Key message: No single intervention is suitable for every situation. Select and coordinate interventions according to local surveillance findings, the target habitat or mosquito behaviour, operational capacity, safety requirements and community context. Follow current national guidance and approved procedures.

ACTIVITY 1.3 – LSM SOP, field guide and operational forms

Purpose: Become familiar with the LSM SOP and operational forms used to prepare, implement, document and review *Aedes* larval source management activities.

Instructions: As you follow the presentation, use the following table to understand the purpose of each document and when you will use it during an LSM operation.

Note: The LSM Field Guide is under development and will be available after the workshop.

Document	What is it for?	When do I use it?	Important to remember
LSM SOP	Sets out the approved procedure, responsibilities, safety requirements and minimum standards for conducting LSM.	**Before:** planning and preparing the operation. **During:** checking procedures and decisions. **After:** reviewing whether the operation was completed correctly.	The SOP tells you **what must be done**. Always use the current approved version.
LSM Field Guide	Provides practical, step-by-step guidance for carrying out LSM activities in the field.	During training and fieldwork when you need practical guidance on **how to carry out a task**.	The Field Guide **supports the SOP but does not replace it**. Follow the SOP, product label, Safety Data Sheet and relevant technical guidance where applicable.
Form A: Individual Premise Mosquito Inspection and Control	Records what you find and what you do at **each individual premise**.	Complete during or immediately after the premise inspection and control activities, **before moving to the next premise**.	**One premise = one Form A.** Record what was actually observed and done, including access, habitats, control actions and follow-up needs.
Form B: Daily Summary of Premises Visited	Summarises the team's premise-level activities and results for the operational day.	Complete from the Form A records and finalise at the **end of the field day**.	**One line = one premise.** Transfer items **(2)–(13)** from Form A, then calculate the daily totals and indicators and complete the required review.

How the documents work together

SOP → Field Guide → Form A → Form B

1. Check the SOP to know what is required.
2. Use the Field Guide for practical guidance on how to carry out the field activity.
3. Complete Form A for each premise.
4. Transfer the required information to Form B to summarise the day's work.
5. Check, review and submit the completed records.

Participant notes

One important thing I want to remember:

Questions to ask the facilitator:

Key message: The SOP guides the operation, the Field Guide helps you carry out the work, Form A records what happened at each premise, and Form B summarises the team's work for the day.

ACTIVITY 1.4 – Container or larval habitat management

Purpose: Identify potential *Aedes* mosquito larval habitats, estimate their water-holding capacity, and recommend appropriate habitat-management measures.

Instructions: Rotate through the habitat stations and photographs. At each station:

1. Observe how water collects or is retained.
2. Estimate the water-holding capacity.
3. Decide whether the habitat could support *Aedes* breeding.
4. Select an appropriate management measure.

Record your answers using ticks and short phrases. No physical management actions will be carried out during this exercise.

Management options

Use one or more short phrases in the table, as appropriate:

1. Remove or dispose of the container.
2. Empty, drain or turn upside down.
3. Cover or seal the container.
4. Repair or replace damaged covers, screens or mesh.
5. Clean or scrub the container.
6. Modify or repair the habitat to prevent water accumulation.
7. Improve drainage or remove stagnant water where appropriate
8. Consider larviciding where physical management is not feasible or sufficient
9. Further inspection or surveillance to determine appropriate action

Station / habitat	Estimated water-holding capacity	Could support *Aedes* breeding?	Recommended management measure
Physical observation stations			
1. Tyres	☐ ≤2 L ☐ >2–20 L ☐ >20 L ☐ N/E	☐ Yes ☐ No ☐ Unsure	
2. Pot plant bases	☐ ≤2 L ☐ >2–20 L ☐ >20 L ☐ N/E	☐ Yes ☐ No ☐ Unsure	
3. Drums	☐ ≤2 L ☐ >2–20 L ☐ >20 L ☐ N/E	☐ Yes ☐ No ☐ Unsure	
4. Coconut shells / small containers	☐ ≤2 L ☐ >2–20 L ☐ >20 L ☐ N/E	☐ Yes ☐ No ☐ Unsure	
5. Buckets	☐ ≤2 L ☐ >2–20 L ☐ >20 L ☐ N/E	☐ Yes ☐ No ☐ Unsure	
6. Tarpaulins / canvas	☐ ≤2 L ☐ >2–20 L ☐ >20 L ☐ N/E	☐ Yes ☐ No ☐ Unsure	
Habitats shown in photographs			
7. Water tanks	☐ ≤2 L ☐ >2–20 L ☐ >20 L ☐ N/E	☐ Yes ☐ No ☐ Unsure	
8. Tree holes / bamboo stumps / crab holes / bromeliads	☐ ≤2 L ☐ >2–20 L ☐ >20 L ☐ N/E	☐ Yes ☐ No ☐ Unsure	
9. Roof gutters	☐ ≤2 L ☐ >2–20 L ☐ >20 L ☐ N/E	☐ Yes ☐ No ☐ Unsure	
10. Boats	☐ ≤2 L ☐ >2–20 L ☐ >20 L ☐ N/E	☐ Yes ☐ No ☐ Unsure	
11. Other habitat: _____	☐ ≤2 L ☐ >2–20 L ☐ >20 L ☐ N/E	☐ Yes ☐ No ☐ Unsure	

N/E = Not readily estimated.

Important: Not every water-holding habitat requires insecticide treatment. Larvicide selection, label interpretation, dose calculations and treatment procedures are covered in a separate activity. Any larvicide use must follow approved product instructions and local program guidance.

Quick reflection

Tick the statement that best reflects your learning.

☐ I can identify potential *Aedes* larval habitats and recommend practical management measures.

☐ I need further guidance on estimating water-holding capacity or selecting management measures.

Key message: Identify the habitat, assess its potential to support breeding and select a practical, safe management measure. Where the appropriate action is uncertain, arrange further inspection or seek technical advice.

ACTIVITY 1.5 – Introduction to larvicides

Purpose: To introduce larvicide products used for mosquito control, their modes of action, suitable habitats and safety requirements.

Learning outcomes: By the end of this activity, you should be able to:

1. Identify larvicide active ingredients and formulations.
2. Interpret product labels and calculate application amounts.
3. Describe how different larvicides affect mosquitoes.
4. Record and interpret observations from a larvicide demonstration.

Larvicide Products

Always check the exact product label and safety data sheet (SDS). Products differ in formulation, approved habitats, application rates, safety precautions and assessment methods. Use only products approved for the intended purpose and follow the relevant label and SOP.

Examples of larvicide products are provided in the table below. Some of these products will be used or demonstrated during this practical activity. **Complete the table by filling in the missing information.**

Product	Active ingredient	General mode of action	Formulation
Aquatain AMF	polydimethylsiloxane (PDMS) (silicone-based liquid)	Spreads across the water surface, forming a thin film that interferes with the breathing and emergence of mosquito larvae and pupae.	LIQUID
VectoBac®	*Bacillus thuringiensis* var. *israelensis* (Bti)	Ingested by mosquito larvae; its toxins damage the larval gut causing death.	WG (water-dispersible granules) - small, dry, concentrated granules
Prolink™	s-methoprene	An insect growth regulator that disrupts normal development, preventing successful emergence of adult mosquitoes.	PELLET- sustained release solid cylindrical pellets BRIQUET XR- extended-release solid moulded brick/block

Remember: Never transfer an application rate from one product or formulation to another. Always check the approved label, target habitat, units, safety requirements and application method.

Calculating Prolink Briquet XR requirements

In Activity 1.4, you identified potential *Aedes* mosquito habitats and considered how they could be managed. Sometimes, a water-storage container may need larvicide treatment if it is appropriate and approved for use.

Scenario: The image shows a water-storage tank with a capacity of **15,000 litres.** According to the product information, one Prolink briquet treats **5,000 litres** of water.



1. Calculate the number of briquets required to treat the full tank.

Calculation: _____

Required number of briquets: _____

2. Before recommending treatment, what should you check?

Tick all appropriate answers.

☐ The product is approved for the intended use and type of water-storage container.

☐ The tank and its intended water use meet the conditions specified on the product label.

☐ The recommended application rate, product instructions and safety precautions have been checked.

☐ Non-chemical management options have been considered where practical.

Remember: This is a calculation exercise, not an instruction to treat the tank. Always follow the current product label, approved procedures and relevant national requirements. A suitable treatment rate alone does not mean that a product is appropriate for every water storage container.

ACTIVITY 1.6 – Label-rate tests for three larvicide products

Purpose: Practise identifying larvicide products, interpreting labels, calculating application amounts and observing larvicide effects.

Practical

Break into three groups of six people per group (Group A, B and C). On Monday, groups will rotate through the three larvicide stations. On the follow-up days, each Group will be stationed at one table (no rotation) when assessing and recording the larvicide treatments on the test larvae.

Exercise 1 – Identify the product and key safety information

Use the product labels and SDS provided by the facilitator. Record only the key information.

Information	Product 1	Product 2	Product 3
Product name and active ingredient			
Formulation			
Approved habitat/use			
Label application rate and units			
One key safety precaution			

Exercise 2 – Larvicide label-rate test on *Aedes aegypti* larvae

Monday - Day 0

- Follow the instructions given by the Facilitator at each test table.

Tuesday - Day 1 (24 hours post treatment)

- Follow the instructions given by the Facilitator and complete the Larvicide Record Form.
- Transfer data to Larvicide Summary Table below. Note that you will need results data from the two other groups to complete the summary.

Wednesday - Day 2 (48 hours post treatment) and Thursday – Day 3 (72 hours post treatment). Note: longer observation periods and assessment of adult emergence are needed for insect growth regulators (e.g., s-methoprene).

- Continue to monitor larvae and record observations in the Larvicide Record Form and Larvicide Summary Table.

Larvicide Summary Table

24 hours							
	A	B	C	D		(B/A)*100	((C+D)/A)*100
Treatment	**Total larvae added**	**24hr dead/moribund larvae/pupae removed**	**24hr live larvae remaining**	**24hr live pupae removed**		**% mortality**	**% alive**
VectoBac low	60						
VectoBac high	60						
Aquatain	60						
Prolink pellets	60						
Untreated control	60						
48 hours							
	A	B	C	D		(B/A)*100	((C+D)/A)*100
Treatment	**Total larvae added**	**24hr + 48hr dead/moribund larvae/pupae removed** (add total from previous day)	**48hr live larvae remaining**	**24hr + 48hr live pupae removed** (add total from previous day)		**% mortality**	**% alive**
VectoBac low	60						
VectoBac high	60						
Aquatain	60						
Prolink pellets	60						
Untreated control	60						
72 hours							
	A	B	C	D		(B/A)*100	((C+D)/A)*100
Treatment	**Total larvae added**	**24hr + 48hr + 72hr dead/moribund larvae/pupae removed** (add total from previous day)	**72hr live larvae remaining**	**24hr + 48hr + 72hr live pupae removed** (add total from previous day)		**% mortality**	**% alive**
VectoBac low	60						
VectoBac high	60						
Aquatain	60						
Prolink pellets	60						
Untreated control	60						

Brief reflection

1. What difference, if any, did you observe between the treated groups and the untreated?

2. Why might different larvicide products require different observation periods or assessment methods?

3. What will you communicate to householders when you use products with s-methoprene?

Key takeaway

Select and apply larvicides according to the target habitat, approved product instructions, correct application rate and safety requirements. Use appropriate monitoring to assess effects. Larvicides are one option within larval source management; where practical and appropriate, consider habitat removal or management without insecticides first.

Day 1 – Key Learning and Questions

One key learning point:

One question or issue requiring follow-up:

DAY 2 | LSM Field Implementation

Purpose

Conduct larval source management in the community including community engagement, premise inspection, container assessment, intervention selection and documentation.

Time	Session
08:30–09:45	RCCE for LSM: engaging households and delivering key messages; discussion and roleplay
09:45–10:15	Field exercise briefing, team assignments and LSM SOP refresher
10:15–10:30	Morning tea
10:30–10:45	Travel to field
10:45–12:45	Household LSM practical
12:45–13:00	Return to SVD facility
13:00–14:00	Lunch
14:00–15:00	Team debrief and facilitator feedback
15:00–15:45	Field data review and LSM documentation
15:45–16:00	Mobility break
16:00–16:30	Larvicide practical: 24-hour assessment
16:30–17:00	Wrap-up and Day 3 briefing

ACTIVITY 2.1 – LSM household engagement roleplay

Purpose: Practise a respectful, clear household conversation before an inspection.

Use Annex 6 of the LSM SOP as a resource.

Instructions: Break into teams of three people. One person takes the role of the Vector Control Officer, one person is the Householder, and the third person is the Observer who provides feedback.

Using the LSM Scenario Prompt Cards, nominate roles then act out the scenario. Practise introducing yourselves, explaining the purpose of the visit and requesting permission to inspect the property, explaining LSM, responding to concerns and agreeing on practical control measures.

Swap roles for each of the three scenarios.

During the roleplay, check that you:

- Introduce yourself and explain the purpose of the visit.
- Request permission before proceeding.
- Explain what the inspection involves and listen to concerns.
- Correctly explain *Aedes* larval habitats and dengue prevention
- Suggest feasible source reduction or safe water-container management; do not insist on removing essential containers.
- Do not dismiss reports of harm or claim that insecticides are harmless; explain reporting and follow-up.
- Explain any appropriate next steps without pressuring the household member.

Key message: Communicate respectfully, request permission, listen to concerns and follow the approved procedure if access is not granted. Encourage people to take responsibility for mosquito habitats around their home.

ACTIVITY 2.2 – Deployment planning checklist for premise inspection and LSM

A. Pre-deployment checklist

Instructions: Before deployment, confirm that the following have been addressed.

☐ The objective, target area and team roles are clear.
☐ Relevant operational documents are available, including the ***LSM SOP, LSM Field Guide*** and applicable larvicide product labels.
☐ ***Form A – Individual Premise Mosquito Inspection and Contro***l and ***Form B – Daily Summary of Premises Visited*** are available.
☐ Permission, household briefing and community communication are planned.
☐ Potential *Aedes* larval habitats and inspection priorities are understood.
☐ Risk assessment, safety precautions and required PPE are reviewed.
☐ Inspection equipment and source reduction/container management supplies are available.
☐ Approved larvicides and application equipment are available, where applicable.
☐ Arrangements for waste management, equipment cleaning and incident reporting are clear.

B. Field documentation

Use the PacMOSSI field forms during supervised premise visits.

- **Form A – Individual Premise Mosquito Inspection and Control:** Complete one form per premise visited. Record inspection findings, potential *Aedes* habitats, control measures undertaken and larvicide application details, where applicable.
- **Form B – Daily Summary of Premises Visited:** Summarise the relevant information from Form A, including daily totals, indicators and calculations.

Remember:

- Record identified habitats, even if no control measure is implemented.
- Record only activities actually undertaken.
- Check that records are accurate and complete.
- Follow the relevant SOPs and facilitator guidance.

Use the completed forms during the team debrief. Do not duplicate operational records in this workbook.

ACTIVITY 2.3 – Field activity: premise inspection and LSM

Instructions: Working in your assigned team, conduct a supervised household visit following the LSM SOP.

During the visit:

- Introduce the team, explain the purpose of the visit and obtain permission to inspect.
- Systematically inspect accessible areas for actual and potential *Aedes* larval habitats.
- Identify and discuss appropriate LSM actions following the hierarchy of control.
- Carry out approved control measures as directed by the facilitator.
- Complete **Form A: Individual Premise Mosquito Inspection and Control** as you conduct the visit.
- Record any issues or follow-up required.

Remember: Record what you actually observe and do. Do not complete Form A later from memory.

ACTIVITY 2.4 – Debrief and data quality

Instructions: Discuss your team's experience with the facilitator.

1. What went well, and what was challenging during the household visit?

For example: introducing yourselves, explaining the purpose of the visit, identifying potential Aedes habitats and discussing appropriate control measures.

2. What would you improve next time to strengthen safety, household communication or data quality?

Consider household communication, habitat inspection, selection of control measures, safety and completion of Forms A and B.

3. Field data review

Using the forms completed during the field activity:

1. **Review Form A** for completeness and accuracy.
2. **Transfer items (2)–(13)** from Form A to Form B.
3. Enter **one row for each premise visited**.
4. Check that the information on Forms A and B is consistent.
5. Complete the required daily totals and indicators.
6. Discuss any errors, missing information or follow-up requirements with the facilitator.

Data quality check

Before submitting the forms, check:

☐ Premise ID and access are recorded correctly
☐ Habitats and control actions are recorded
☐ Larvicide use is recorded, if applicable
☐ Follow-up requirements are recorded
☐ Required information has been transferred correctly to Form B
☐ Records are complete, accurate and legible (clear and easy to read)

Remember: Form B summarises the information recorded on Form A. Do not change or add information simply to complete the summary.

Day 2 – Key Learning and Questions

One key learning point:

One question or issue requiring follow-up:

DAY 3 | Spatial Emanators and Residual Spraying Operations

Purpose

Introduce spatial emanators as an additional adult mosquito control intervention and introduce residual spraying operations.

Time	Session
08:00–08:15	Travel to Belna NATNAT Centre (BNC)
08:30–09:30	Spatial emanator demonstration at BNC
09:30–10:15	Morning tea at BNC
10:15–10:30	Travel back to SVD facility
10:30–11:30	Introduction to residual spraying operations
11:30–12:30	Protocol presentation: Residual Spraying - SOPs, spray field guide and form
12:30–13:30	Lunch
13:30–16:00	Sprayer inspection and spray technique: demonstrations and practical exercises
16:00–17:00	RCCE: household preparation and briefing for residual spraying

ACTIVITY 3.1 – Spatial emanator demonstration

Purpose: This demonstration familiarises participants with spatial emanators (SEs) as a potential tool for *Aedes* control. (WHO currently recommends spatial emanators for indoor use against malaria only; evidence for use against *Aedes* and dengue is still being assessed). By the end, participants should be able to deploy SEs correctly in a household and explain the key considerations to community members.

Instructions: Break into three groups and practise how to estimate room requirements and hang spatial emanator devices according to product labels or other guidelines.

1. In one or two sentences, how would you explain to a householder how a spatial emanator works?

2. What factors may affect spatial emanator performance?

Consider room structure, dose rates, mosquito resistance status etc

3. Which product type (short or long duration) would you choose for an outbreak response and which for a full transmission season? Why?

Key reminder: Spatial emanators are an additional vector control option, not a replacement for source reduction, container management, LSM or other locally recommended measures.

ACTIVITY 3.2 – Residual spraying SOPs and Field Operator Guide

Purpose: Become familiar with the key documents used to prepare, conduct and document safe and effective indoor and outdoor residual spraying.

Instructions: As you follow the presentation, use this table to understand the purpose of each document and when you will use it during a residual spraying operation.

Document	What is it for?	When do I use it?	Important to remember
IRS SOP	Sets out the approved procedures, safety requirements and responsibilities for indoor residual spraying.	Before, during and after IRS operations.	Use for spraying indoor mosquito resting sites. Follow the Safe Work Instruction, product label and applicable safety requirements.
ORS SOP	Sets out the approved procedures, safety requirements and responsibilities for outdoor residual spraying.	Before, during and after ORS operations.	Use for spraying outdoor mosquito harbourages. Pay particular attention to weather, spray drift, water sources and other non-target areas.
Residual Spraying Field Operator Guide	Provides practical guidance on equipment, preparation and correct spray techniques for IRS and ORS.	During training and field operations when you need practical guidance on how to perform a spraying task.	The Field Guide supports the SOPs but does not replace them. Use the section appropriate to the equipment and type of spraying being conducted.
Product label, SDS and PacMOSSI Technical Note	Provide product-specific requirements for insecticide preparation, application, PPE, storage and disposal.	Before selecting, mixing, applying, storing or disposing of an insecticide.	Always check the product-specific instructions. Do not assume the same requirements apply to every insecticide or to both IRS and ORS.

Recording reminder

Continue to use **Form A** to document the premise inspection and any residual spraying undertaken. Transfer the required information to **Form B** for the daily summary. Refer back to **Session 1.4** if you need a reminder about how Forms A and B are used.

Remember

- **IRS and ORS are not interchangeable.** Use the SOP appropriate to the target mosquito resting behaviour and treatment area.
- **Inspect before spraying.** Identify target resting sites or harbourages, hazards and areas that must not be sprayed.
- **Obtain permission before spraying.**
- Only trained and authorised personnel should conduct spraying.
- Wear the PPE required by the product label and SDS.
- Check that spray equipment is safe, functional and appropriate for the operation.
- **If conditions are unsafe, do not spray.** Stop spraying if unsafe conditions develop.
- Protect people, animals, food, drinking water and non-target areas.
- Record what was actually inspected and treated.
- Clean equipment, manage waste safely and complete records before finishing the operation.

Participant notes

One important thing I want to remember:

One question I still have:

Key message: The SOP tells you what must be done, the Field Operator Guide shows you how to carry out the spray operation, and the product label, SDS and Technical Note tell you how to use the selected insecticide safely and correctly.

ACTIVITY 3.3 – Introduction to insecticide products for residual spraying

Purpose: Identify the active ingredient, insecticide class, mode of action and formulation of insecticides used for residual spraying.

Instructions: Complete the table by filling in the blanks.

Always check the exact product label and safety data sheet (SDS). Products differ in formulation, approved application surfaces, residual activity, application rates, safety precautions and assessment methods. Use only products approved for the intended purpose and follow the relevant label and SOP.

Examples of residual spraying insecticide products used in this practical.

Product*	Active ingredient	Insecticide class	General mode of action	Formulation
Demand® 100CS	lambda-cyhalothrin	pyrethroid	A synthetic pyrethroid that acts on the insect nervous system by disrupting sodium channel function, causing paralysis and death.	capsule suspension
Actellic® 300CS	pirimiphos-methyl	organophosphate	An organophosphate that inhibits acetylcholinesterase, disrupting normal nerve signal transmission and causing paralysis and death.	
Seclira® WSG	dinotefuran	neonicotinoid	A neonicotinoid that binds to nicotinic acetylcholine receptors in the insect nervous system. This causes continuous nerve stimulation, leading to paralysis and death.	

** Note that products may not be WHO pre-qualified for vector control*

Remember: Never transfer an application rate from one product or formulation to another. Always check the approved label, target surface, formulation, application rate, safety requirements and application method. Residual activity and effectiveness can vary depending on the product, treated surface and environmental conditions.

ACTIVITY 3.4 – Sprayer inspection and technique

Purpose: Observe the facilitator's demonstration of sprayer inspection, safe operation and application technique.

Instructions: Tick the items demonstrated. Record only important observations or questions that require follow-up.

1. Pre-use inspection

Check	Observed
Tank, lid, seals and straps checked	☐
Hose, trigger valve, lance and nozzle checked	☐
Equipment checked for damage, leaks or blockages	☐
Equipment prepared according to approved instructions	☐

2. What faults or safety concerns would require work to stop?

Tick the examples discussed during the demonstration.

Check	Discussed
Leaks or damaged components	☐
Blocked or damaged nozzle	☐
Equipment not operating correctly	☐
Missing or unsuitable PPE	☐
Weather or site conditions make spraying unsafe	☐
Uncontrolled risk to people, animals or the environment	☐

3. Application technique and quality

Tick the techniques demonstrated and relevant to the spraying method.

Technique or quality check	Observed
Inspect the area and identify approved treatment surfaces	☐
Check equipment settings and calibration as required	☐
Demonstrate the correct spraying technique for the method	☐
Maintain the required application distance, speed and pattern	☐
Check application quality and document the work	☐

4. Key observation or question

What is one important technique, safety point or quality check you want to remember?

Safety reminder: Follow the applicable IRS or ORS SOP, equipment instructions, approved product guidance and risk assessment. Stop work and seek advice if equipment is faulty or conditions are unsafe.

ACTIVITY 3.5 – Household briefing for residual spraying

Purpose: Identify and practise the key information residents need before conducting authorised residual spraying operations in the community

1. What should residents be told?

Stage	Key information to communicate
Before spraying	Explain the purpose of the operation, which surfaces will be treated, what residents need to do to prepare, and confirm agreement in accordance with program procedures.
During spraying	Explain that residents and animals must stay away from the active work area and follow the operator's instructions.
After spraying	Explain the product-specific requirements for drying, ventilation, cleaning restrictions and re-entry, following approved guidance.

2. What would you check before spraying begins?

Tick the items that need to be confirmed.

- Residents understand the purpose of the operation and which surfaces will be treated.
- Residents know how to prepare the household and where people and animals should stay.
- Residents understand the safety precautions and applicable re-entry instructions.
- Questions, concerns or special circumstances have been addressed or referred to the authorised supervisor.

3. How will you check that residents understand?

Write one approach you could use.

Do not simply ask, *"Do you understand?"* Ask the resident to explain an important instruction back in their own words.

Example:
"Can you tell me when your family can go back inside?"

4. Roleplay exercise

Break into teams of three people. One person takes the role of the Vector Control Officer, one person is the Householder, and the third person is the Observer who provides feedback.

Using the RS Scenario Prompt Cards, nominate roles then act out the scenario. Practise introducing yourselves, explaining the purpose of the visit and requesting permission to inspect and spray the property, explaining RS and responding to concerns.

Swap roles for each of the three scenarios.

Observer checklist

During the role-play, did the Vector Control Officer:

- ☐ Introduce the team and explain the purpose of the visit
- ☐ Request permission before inspection or treatment
- ☐ Explain what will and will not be sprayed
- ☐ Explain how the household should prepare
- ☐ Explain where people and animals should stay during spraying
- ☐ Provide the appropriate post-spraying and re-entry instructions
- ☐ Respond respectfully to questions or concerns
- ☐ Check that the resident understood the instructions

Safety reminder: Always follow the current IRS/ORS SOP, approved product instructions, risk assessment and authorised operator guidance. Do not give product-specific safety, drying or re-entry instructions unless they have been confirmed against the approved guidance.

Key message: A household briefing should be clear, practical and appropriate to the local context. Residents should understand what will happen, what they need to do, and how to follow the relevant safety instructions.

Day 3 – Key Learning and Questions

One key learning point:

One question or issue requiring follow-up:

DAY 4 | Residual Spraying Field Implementation

Purpose

Apply the IRS SOP, ORS SOP and Residual Spraying Field Operator Guide in a supervised field setting. Practise deployment planning, risk assessment, premise inspection, household engagement, spraying technique, safety and documentation.

Time	Session
08:30–09:30	Mission/Deployment briefing, team preparation
09:30–09:45	Morning tea
09:45–10:00	Travel to field
10:00–12:15	Residual spraying field exercise
12:15–12:30	Return to SVD facility
12:30–13:00	Clean equipment
13:00–14:30	Lunch
14:30–15:00	Reflection on IRS field exercise
15:00–16:00	Feedback on spray quality, safety, RCCE and documentation
16:00–17:00	ORS mist sprayer demonstration: safe operation and application technique

ACTIVITY 4.1 – Deployment planning checklist for residual spraying

Purpose: Ensure preparedness prior to deployment.

Instructions: Before deployment, confirm that the following have been addressed.

☐ The objective, target area and team roles are clear.

☐ Relevant operational documents are available including ***IRS SOP, ORS SOP, Residual Spraying Field Operator Guide, Risk Communication and Community Engagement (RCCE) for Residual Spraying*** and applicable product labels.

☐ Required field recording forms are available, including ***Form A – Individual Premise Mosquito Inspection and Control Form*** **and** ***Form B - Daily Summary of Premises Visited***.

☐ Permission, household briefing and community communication are planned.

☐ Risk assessment and control measures are reviewed.

☐ Operators are authorised, trained and equipped with required PPE.

☐ Equipment condition, calibration / settings and supplies are checked as required by the SOP.

☐ Weather, site conditions, access and other operational constraints are considered.

☐ Documentation, waste management, equipment cleaning and incident reporting arrangements are clear.

ACTIVITY 4.2 – Field activity: residual spraying

Instructions: Working in your assigned team, conduct a supervised residual spraying household visit following the applicable IRS or ORS SOP and Residual Spraying Field Operator Guide.

During the visit:

☐ Introduce the team, explain the visit and obtain permission
☐ Inspect the premise and identify appropriate treatment areas
☐ Confirm hazards, exclusions and safety requirements
☐ Prepare the household and equipment as required
☐ Apply the correct spray technique under facilitator supervision
☐ Follow the product-specific safety and application requirements
☐ Complete Form A as the activity is conducted
☐ Record any operational issues or follow-up required

Remember: Spray only approved treatment areas and record what was actually inspected and treated.

ACTIVITY 4.3 – Equipment clean-up

Purpose: Observe and practise the correct post-operation procedures for spray equipment.

Instructions: Check the steps demonstrated:

☐ Depressurise and make equipment safe before cleaning
☐ Handle remaining insecticide according to approved instructions
☐ Clean equipment using the procedure appropriate to the sprayer and product
☐ Check equipment for damage, leaks or maintenance needs
☐ Manage rinsate and waste according to approved procedures
☐ Remove and manage PPE safely
☐ Store equipment and insecticide safely after use
☐ Report equipment faults, spills or incidents

Safety reminder: Follow the applicable SOP, product label, SDS and approved procedures when cleaning equipment or managing insecticide waste

One important clean-up point I want to remember:

ACTIVITY 4.4 – Reflection on the residual spraying field activity

Take a few minutes to reflect on your experience during the IRS practical.

One thing that became clearer after doing the practical:

One thing I would improve next time:

What do I still need to practise?

☐ Household preparation and communication
☐ Premise inspection and identification of treatment surfaces
☐ Equipment preparation
☐ Spray technique
☐ Maintaining the correct distance, speed and spray pattern
☐ Safety and PPE
☐ Completing Form A
☐ Equipment clean-up
☐ Other: _____

One question for the facilitator:

Key message: Effective IRS requires good household communication, careful preparation, safe work practices, consistent application and accurate documentation.

ACTIVITY 4.5 – Debrief and quality review

Purpose: Identify what went well and what could be improved, using your observations and facilitator feedback.

Instructions: During the debrief, discuss the areas below and record brief notes.

Field documentation and recording forms

During this practical, focus on the adulticide/residual spraying sections of the following forms:

- **Form A – Individual Premise Mosquito Inspection and Control:** Focus on premise access, household acceptance, indoor and outdoor spraying activities, areas treated, insecticide product details, application information and any operational issues or follow-up requirements.
- **Form B – Daily Summary of Premises Visited:** Focus on daily premises visited and sprayed, IRS and ORS coverage, access and refusal rates, insecticide products and quantities used, and relevant daily indicators.

For this exercise, concentrate on the residual spraying components of the forms. Larval habitat assessment, source reduction and larvicide recording are covered separately during the LSM practical.

Review area	Key observation or improvement action
Planning and team roles	
Household engagement and RCCE	
Risk management and PPE	
Equipment and application technique	
Spray quality and quality checks	
Field Documentation and use of forms	
Equipment clean-up and waste management	
Follow-up and reporting	

Review your field records

Using the forms completed during the practical:

☐ Check Form A for completeness and accuracy
☐ Confirm premise access and spraying activities are recorded correctly
☐ Check insecticide and application information
☐ Record operational issues and follow-up requirements
☐ Transfer the required information to Form B
☐ Check that Forms A and B are consistent

Quick reflection

What was one important safety or operational check before spraying?

What is one improvement your team would make next time?

ACTIVITY 4.6 – ORS mist-sprayer demonstration

Purpose: Record the demonstrated operating principles, application techniques and safety considerations for outdoor residual spraying (ORS).

Instructions: Observe the safe operation, application technique and maintenance requirements demonstrated for outdoor residual spraying (ORS).

1. Pre-use and post-use checks

Tick the checks demonstrated. Follow the applicable SOP and equipment instructions.

Check	Observed
Inspect the tank, hoses, seals, nozzle and connections for damage or leaks	☐
Check the engine, controls and other components as applicable	☐
Confirm equipment settings and readiness according to the SOP	☐
Use the required PPE and check the work area for hazards	☐
Shut down the equipment safely after use	☐
Clean and maintain the equipment as instructed	☐
Check for damage or faults and report any problems	☐
Handle leftover product, washings and waste according to approved procedures	☐

One important check to remember:

2. Selecting outdoor target sites

Which factors should be considered when selecting ORS target sites? Tick those discussed during the demonstration.

☐ Evidence or knowledge of where target mosquitoes rest.
☐ Whether the surface or vegetation is approved for treatment.
☐ Whether the site can be accessed and treated safely.
☐ Potential exposure of people, animals and non-target areas.
☐ Weather and environmental conditions.
☐ Product instructions, the ORS SOP and the risk assessment.

One target-site consideration to remember:

3. Environmental, exposure and access considerations

Which conditions could affect safe application or treatment performance? Tick those discussed.

☐ Rain or other weather conditions.
☐ Wind and potential spray drift.
☐ Presence of people, animals or other potential exposure hazards.
☐ Nearby water sources or other environmentally sensitive areas.
☐ Difficult access, uneven ground or other site hazards.
☐ Other restrictions specified in the SOP or product instructions.

4. Before implementing ORS

Confirm that you would check the following before field implementation.

☐ Product approval and permitted target sites.
☐ Product label instructions, application settings and required PPE.
☐ Equipment preparation, operation and maintenance requirements.
☐ Weather restrictions, exposure precautions and environmental safeguards.
☐ Required records, cleaning and waste-disposal procedures.

5. When should ORS not proceed?

Discuss situations where spraying should not begin or should be stopped.

☐ Weather conditions are unsuitable
☐ Spray drift cannot be adequately controlled
☐ People or animals cannot be kept away from the treatment area
☐ Water sources or other sensitive areas cannot be protected
☐ Equipment is damaged, leaking or not operating correctly
☐ Required PPE is not available
☐ The proposed target or application is not permitted by the product instructions
☐ Another hazard cannot be adequately controlled

6. Key observation or question

What is one important difference you noticed between operating a mist-blower for ORS and the IRS practical?

Key message: ORS must be conducted only by trained and authorised personnel using approved products, equipment and procedures. Follow the current ORS SOP, product instructions, risk assessment and supervisor direction. If conditions become unsafe, stop spraying and reassess.

Day 4 – Key Learning and Questions

One key learning point:

One question or issue requiring follow-up:

Purpose

Translate workshop learning into practical action by identifying country priorities, reviewing available resources, sharing regional solutions and developing a realistic 90-day action plan.

Time	Session
08:30–09:00	Where do we start? Identify one or two realistic *Aedes* VC activities
09:00–10:15	What do we have? Identify resources, capacities and opportunities
10:15–10:30	Morning tea
10:30–11:45	Pacific Solutions Exchange: What can we learn from each other?
11:45–12:00	Regional implementation priorities: What do we need to do first?
12:00–13:00	Lunch
13:00–14:15	Capstone: My First 90 Days Back Home – Where do I go from here?
14:15–15:00	90-day action plan: refining my plan
15:00–15:15	Mobility break
15:15–16:00	Back-home implementation commitments: How will I make it happen?
16:00–16:45	Workshop review, key messages, evaluation and next steps
16:45–17:00	End of workshop

ACTIVITY 5.1 – Where are we now?

Purpose: Identify a practical *Aedes* vector control priority for your setting.

1. What is the main *Aedes* control challenge or opportunity in my area?

2. Which one or two activities could we realistically start or strengthen?

☐ Source reduction and container management (e.g., removing, covering or managing water-holding containers).

☐ Larviciding of relevant *Aedes* larval habitats.

☐ Adult *Aedes* mosquito control (e.g., IRS or ORS), where appropriate.

☐ Community engagement and participation to support sustained mosquito control activities.

☐ Vector surveillance

☐ Staff training or operational capacity

☐ Other: _____

ACTIVITY 5.2 – What do we have?

Purpose: Identify existing resources, strengths and gaps before deciding what is feasible.

Complete the table with brief notes.

Area	What is available?	Main gap or support needed
Staff and skills		
Data and technical guidance		
Equipment, transport and funding		
Community networks and partners		
Existing plans and routine activities		

Which existing resource or partnership could help us get started?

ACTIVITY 5.3 – Pacific solutions exchange

Purpose: Identify one useful idea from another participant or country that could be adapted to your setting.

Prompt	Brief notes
Useful practice or solution shared	
Problem it addressed	
What helped make it work?	

What would need to change for it to work in my setting?	
Who could I contact or consult?	

Key message: Adapt solutions to local needs, resources, national guidance and community context rather than assuming that an approach used elsewhere will work unchanged.

ACTIVITY 5.4 – Regional implementation priorities

Purpose: Agree on the most important areas where regional collaboration or support could help countries strengthen *Aedes* control.

Instructions: Based on your discussions in Activities 5.1–5.3, agree on up to three regional priorities.

Regional priority	Why is it important?	What regional support or collaboration could help?
E.g., Strengthen routine *Aedes* surveillance and operational data quality.	Reliable information is needed to identify priority locations, habitats and gaps.	Shared protocols, training, data tools, indicator definitions and peer review.
1.		
2.		

One practical opportunity for regional collaboration:

FROM REGIONAL PRIORITIES TO ACTION BACK HOME

Instructions: You have identified shared challenges, resources and solutions across the region. Now consider **your own country and work setting**.

In the next section, My First 90 Days Back Home, choose a priority that is relevant and realistic for you and develop a practical plan for your first 90 days back home.

Day 5 – Key Learning and Questions

One key learning point:

One question or issue requiring follow-up:

My First 90 Days Back Home

Instructions: Choose one focused and realistic priority. Plan manageable steps, identify who needs to be involved and decide how you will measure progress.

Reminder: Confirm that proposed activities align with national policy, relevant authorisations, approved procedures and available resources.

1. My implementation priority

Planning prompt	My plan
Priority activity	
Problem or opportunity being addressed	
Target area or population	
Why this is feasible and important now	
Existing resources or strengths to use	
Main gap or risk to address	
People, teams or partners to involve	
Support or approval needed from my manager	
How I will measure and document progress	

2. My 90-day timeline

When	Key action or milestone	Who will lead or support?	Evidence of progress
Days 1–30			
Days 31–60			
Days 61–90			

3. Main implementation risks

Instructions: Identify up to four important barriers and how you will address them.

Risk or Barrier	How will I address it or seek support

4. My implementation commitment

My first step within seven days of returning:

The person I will speak to first and what I will ask for:

What I will report back to my team by Day 30:

How I will share progress with colleagues, peers or workshop facilitators:

Personal Learning Review

Instructions: Before the workshop closes, reflect on the following.

Final reminder: A successful 90-day plan is realistic, locally appropriate and supported by the people and resources needed to implement it. Start with a manageable action, review progress and adjust as needed.

Reflection question	My notes
What is the most useful thing I learned this week?	
Which practical skill do I feel more confident using?	
What technical support or further practice do I still need?	
What is one thing I will do differently when I return home?	

Field Notes and Questions

Use these pages to capture observations, questions for facilitators and follow-up tasks.

Notes page 1

Notes page 2

Notes page 3

Resource Pack and Follow-up

The following resources are provided for reference and follow-up. Before using any resource in operational work, confirm that you have the current, approved version applicable to your country or program.

Updated PacMOSSI SOPs, field guides and forms are available on the PacMOSSI Technical Guidance website.

Resource	Purpose / How I will use it
Participant Workbook	Refer to the agenda, activity summaries, practical exercises and participant notes to refresh workshop learning.
LSM SOP	Refer to approved procedures for planning and implementing larval source management activities.
LSM Field Guide	Use as a practical reference to identify and assess *Aedes* breeding habitats and select appropriate habitat-management measures.
IRS SOP	Follow approved procedures for planning and implementing indoor residual spraying operations.
ORS SOP	Follow approved procedures for planning and implementing outdoor residual spraying operations.
Residual Spraying Field Operator Guide	Refer to practical guidance for IRS and ORS implementation, including equipment use, application techniques and safety.
Premise Mosquito Inspection and Control Form	Use to record the inspection findings required during household visits.
Daily Summary of Premises Visited Form	Summarise daily inspection totals and calculate the required indicators.
Risk Assessment Form	Use the template in the relevant SOP annex to identify hazards, assess risks and document control measures before activities.
RCCE Materials	Adapt example household messages, briefing sheets and community engagement materials to support communication with communities.
Larvicide and Adulticide Product Information Sheets	Check product-specific instructions, calculation examples, approved uses and safety requirements before use.
90-Day Action Plan Template	Develop an individual plan for applying workshop learning after returning to your workplace.
Workshop Slide Decks (PDF)	Review workshop presentations to refresh knowledge and share key learning with colleagues.
Workshop Contact Directory	Connect with facilitators and participants for networking, troubleshooting and peer learning after the workshop.

Before implementing an activity, check the current national guidance, relevant approved SOPs, product instructions, risk assessment and authorisation requirements. Use each form according to its intended purpose and the applicable reporting procedures.

Final Workshop Messages

Select vector control responses according to the local situation, surveillance findings, operational capacity and national guidance. The examples below illustrate possible priorities; they are not a substitute for national protocols or a local risk assessment.

Situation	Priority Response
Routine *Aedes* prevention	Surveillance + premise inspections + LSM + RCCE
High vector densities	Enhanced surveillance + targeted LSM + RCCE
Localised transmission risk	Surveillance + LSM + RCCE + targeted adult mosquito control (e.g., IRS/ORS), where appropriate
Dengue outbreak	Intensified surveillance + RCCE + targeted LSM + targeted adult mosquito control (e.g., IRS/ORS) where appropriate and authorised + targeted LSM when possible
Post-outbreak recovery	Continued surveillance + LSM + preparedness
Long-term program strengthening	Training + SOP implementation + community partnerships + monitoring

Key message: Use surveillance and local assessments to guide decisions. Select appropriate, feasible and authorised interventions, engage communities, follow approved procedures, and monitor and document activities to inform future action.

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