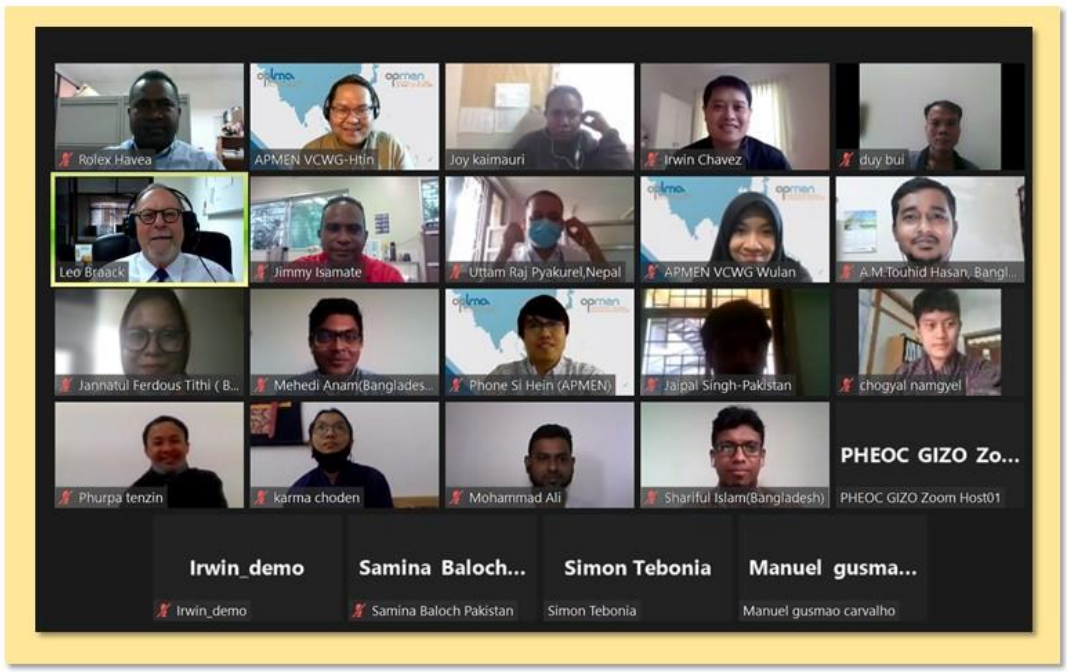


Online Course on GIS in Malaria Vector Surveillance
16-20 August 2021

Asia Pacific Malaria Elimination Network, Vector Control Working Group

Online Course on GIS in Malaria Vector Surveillance

16-20 August 2021

TRAINING REPORT

Introduction

Vector surveillance is critically important to guide vector control interventions and includes many activities such as adult and larval mosquito collections, mosquito identification, and others. In this course we focus on just one element, namely Geographic Information Systems (GIS) that enable mapping, stratification and visualization of key data that assist in planning of vector control interventions. GIS enables better decision making and improved communication between field officers, district health offices and the Ministry of Health as it has more tailored geographic information for the users.

Organization and hosting

The course is organized by the APLMA-APMEN Vector Control Working Group (VCWG) and Mahidol University, supported by the USA Centres for Disease Control & Prevention (CDC).

Targeted Audience

The course is part of a broader portfolio of courses provided by APMEN, which collectively aim to build capacity of field-entomologists, vector biologists, vector control specialists, and vector control researchers within National Malaria Control Programs and Partner Institutions.

Method and Language

This course was provided on a virtual platform, using English as the medium of instruction.

Curriculum

The curriculum (Annex n) was designed to address the needs as expressed by a Needs Assessment and adapted for an online training.

Training Materials

Please find the training materials and mapping-related sources in the link below.

Download here

Facilitators

Resource Person/Role	Affiliations
Mr. Irwin F. Chavez (Instructor)	Mahidol University
Dr Leo Braack (Organizer)	APMEN VCWG / Malaria Consortium
Dr Htin Kyaw Thu (Organizer)	APMEN VCWG / Malaria Consortium
Dr Phone Si Hein (Organizer)	APLMA
Shobiechah A. Wulandhari (Organizer)	APMEN VCWG / Malaria Consortium

Summary of Course Participation

55% of the participants are in a Supervisory Level in term of responsibility.

80% participants are male, 20% are female.

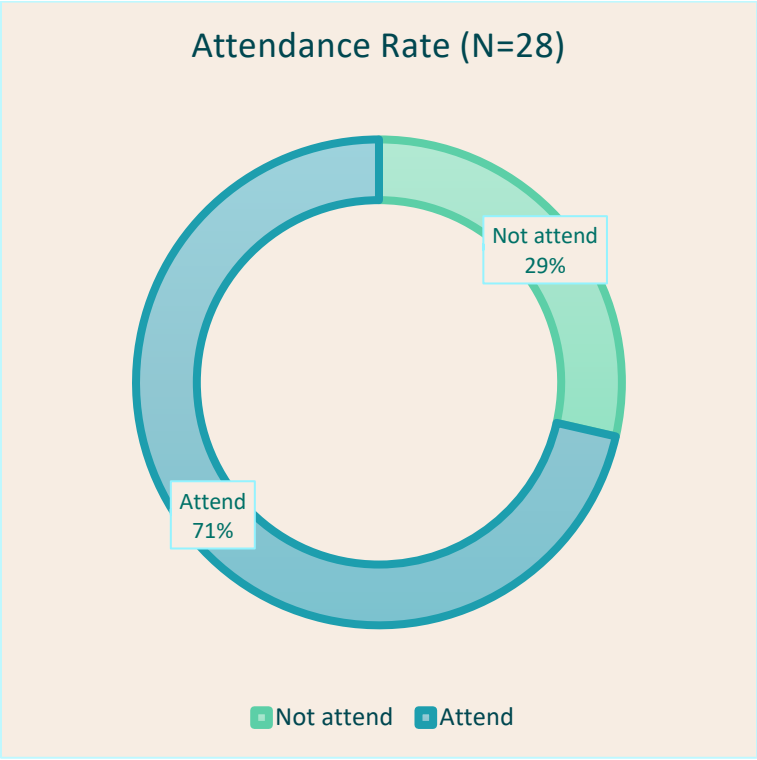
The participants geographic distribution was very diverse, from South Asia to Melanesia.

100% of the GIS Course participants said the Course is relevant for them.

1. Participant's characteristics and geographic distribution

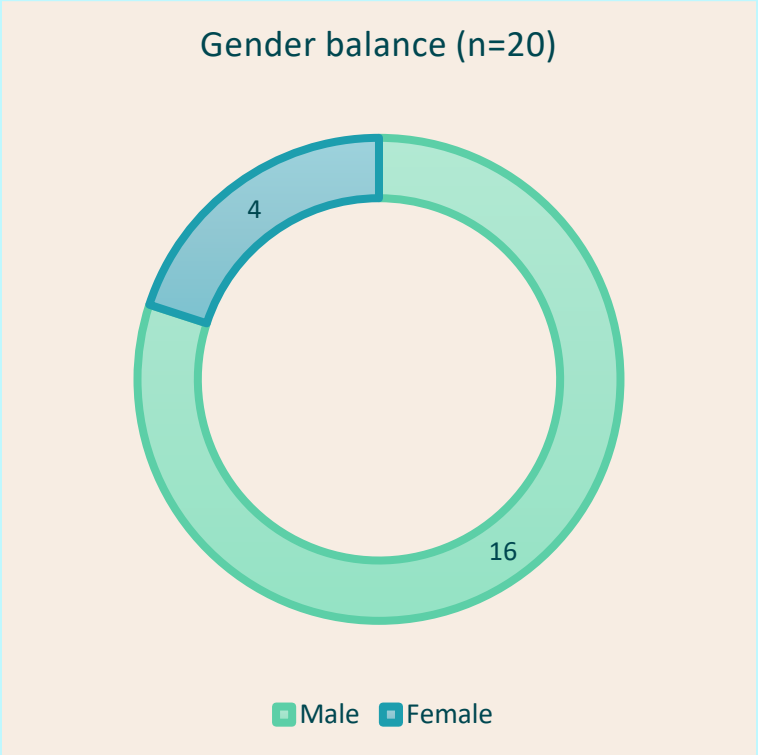
- Attendance rate

  The pie chart illustrates the attendance rate of the GIS participants and the nominees. Of 28 nominees, 20 of them (71%) joined the GIS Course sessions. Some participants could not attend the course due to covid-19 duties and limited internet connection.



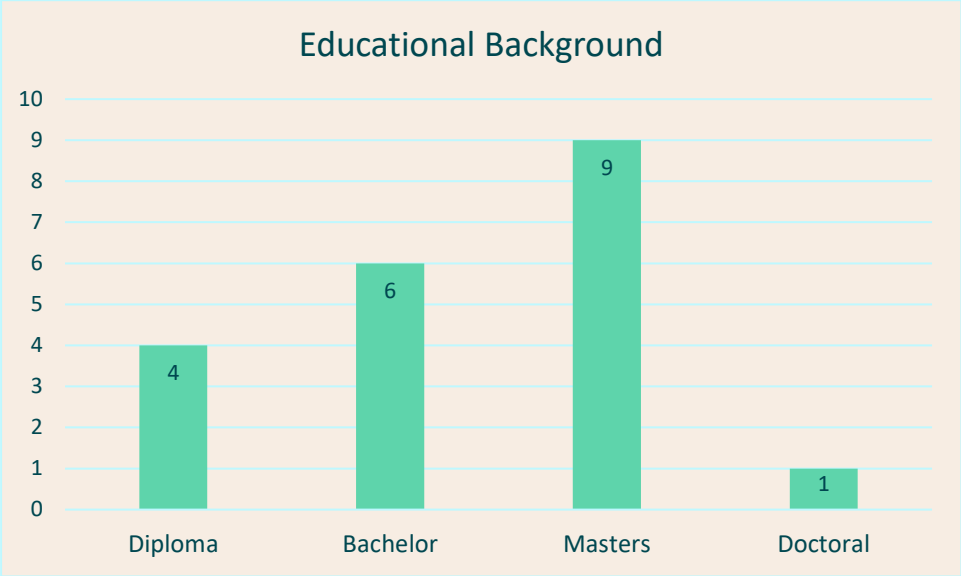
- Gender

  Among the total GIS Course participants, there were 4 female attendants, and 16 male attendants, representing a ratio of 4 male registrants per female registrant. There was thus an unfortunate imbalance in the gender composition of the GIS course, and it might indicate the gender distribution of entomologists in Asia Pacific. APMEN/APLMA strives to achieve gender balance in our outreach activities.

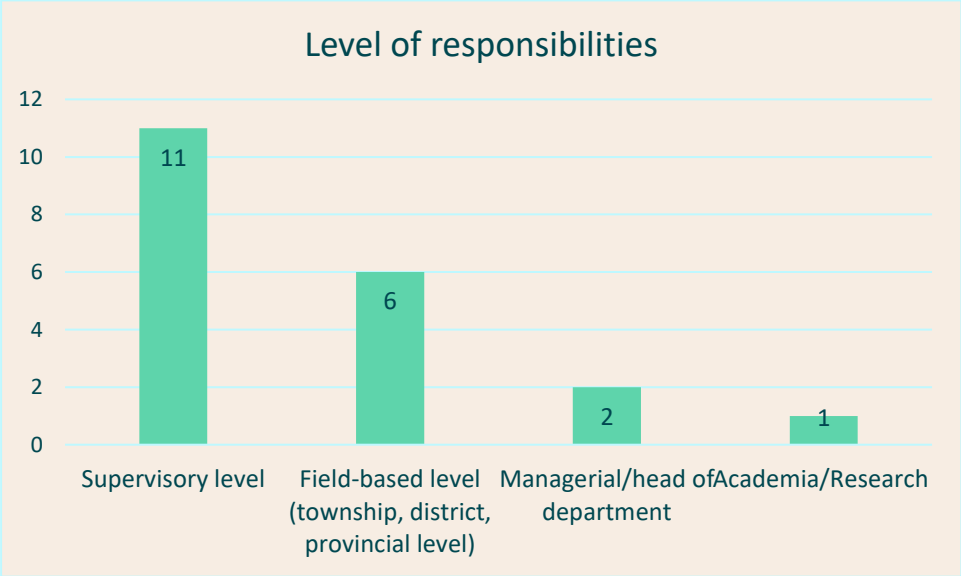


- Geographic distribution
  The majority of our participants came from APMEN target countries in Asia Pacific region, namely Solomon Islands (5), Bangladesh (5), Bhutan (3), Pakistan (2), Afghanistan (1), Lao PDR (1), Vietnam (1), and Timor Leste (1).

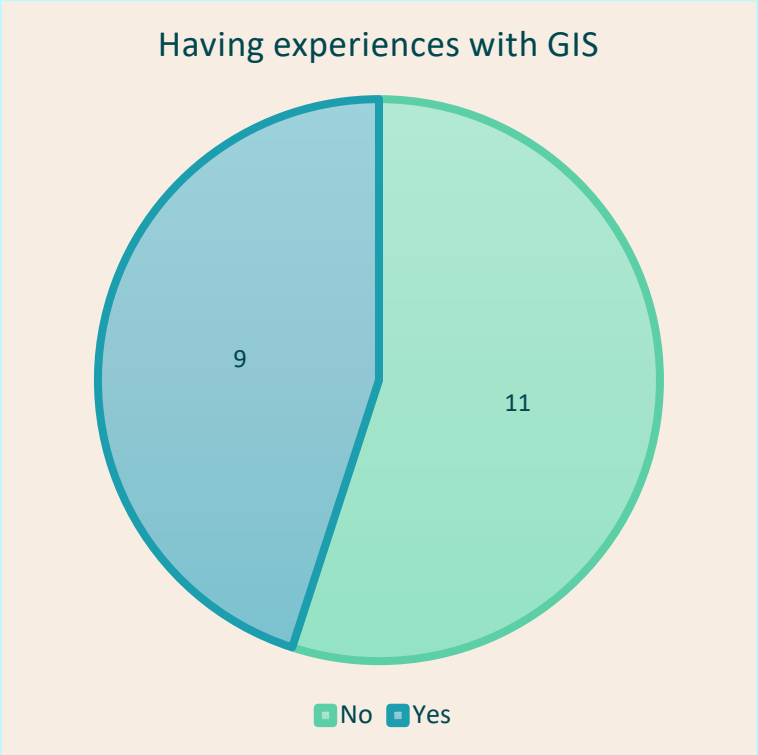
- Educational background
  Most participants (n=9, 45%) held a master's degree, followed by bachelor's degree and diploma; only 1 participant completed a doctoral degree.



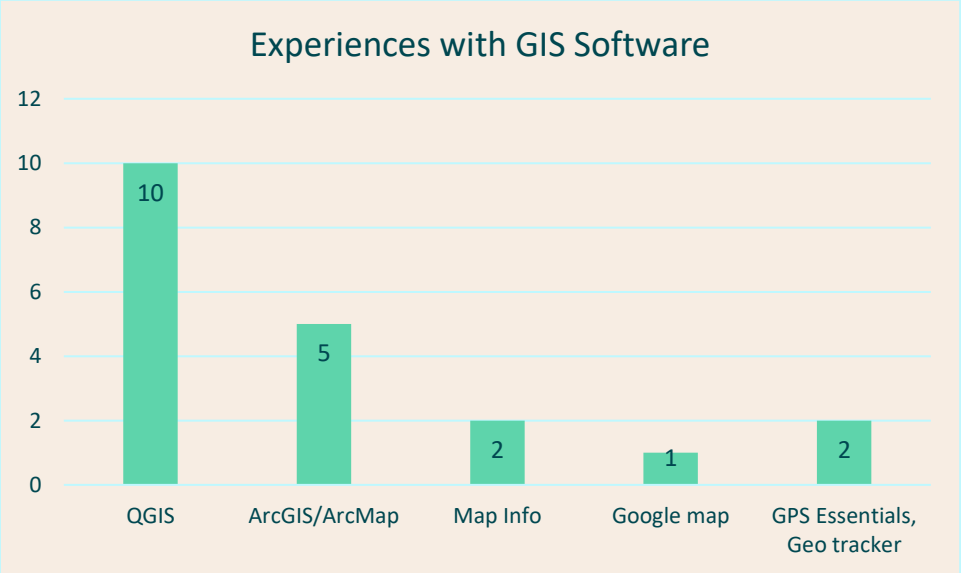
- Level of responsibility
  Most of the participants' level of responsibilities are at Supervisory Level (n=11, 55%), followed by Field-based Level (n=6). With this balance, we hope that entomological surveillance mapping can produce more tailored and evidence-based programmes that give benefits on vector control.



- Experiences with GIS
  More than 50% of the participants had no prior experiences with GIS in term of vector surveillance. This course could give huge benefits and new insights for the participants on how to apply spatial information in vector control and surveillance.

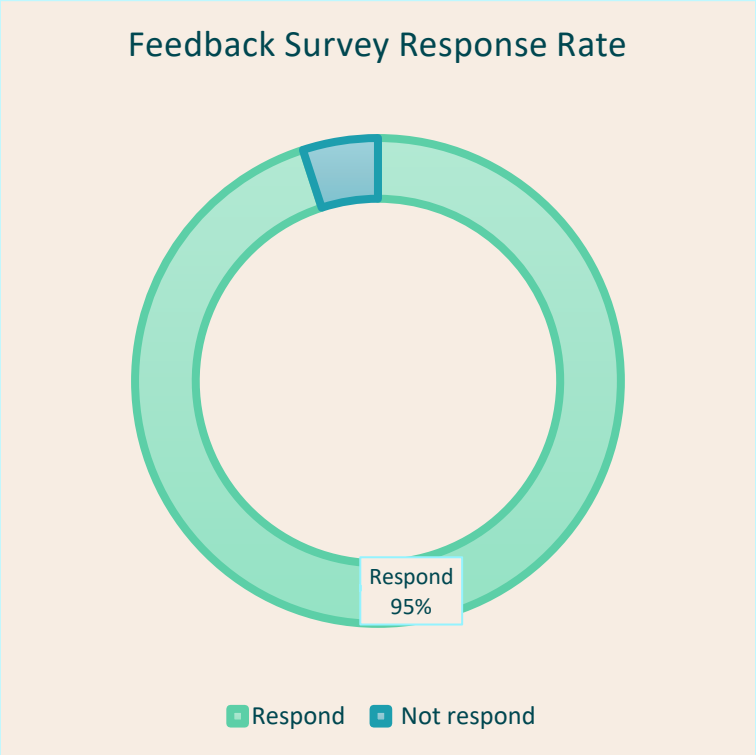


- Experiences with GIS software
  Fifty percent of the participants has some experiences with QGIS, the same software that we used in this online GIS Course. This familiarity with the software made the participants more comfortable to understand the subjects and easier for the instructor to teach.

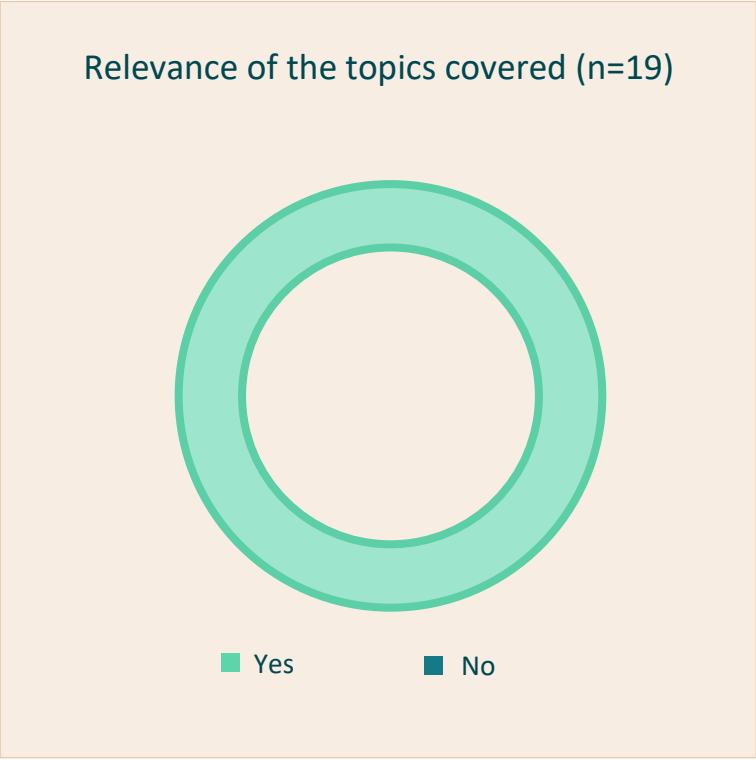


Participant's Feedback

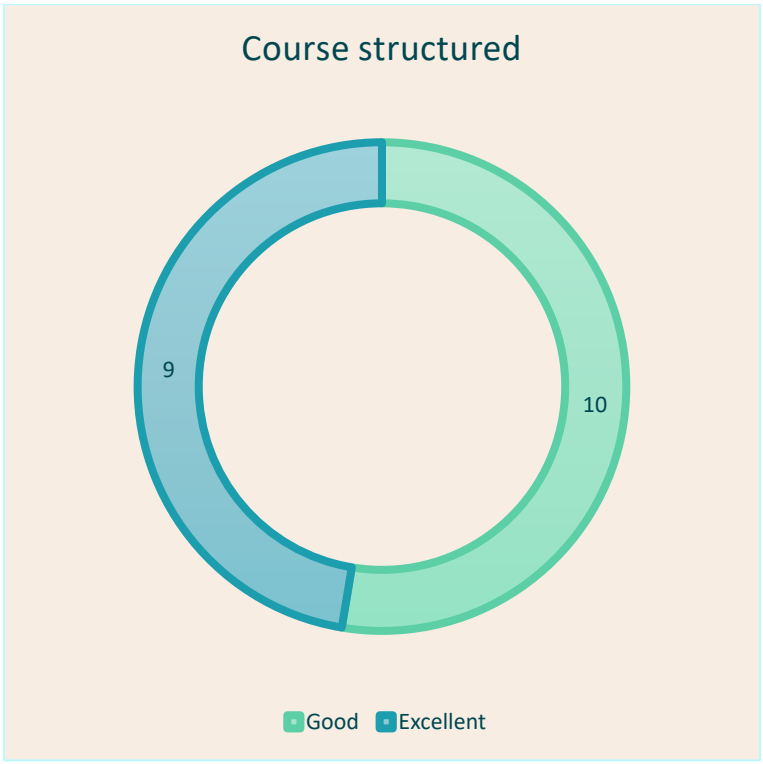
- Response rate
  Among 20 participants, 19 people (95%) responded to the feedback survey to evaluate instructor performance and quality of the course.



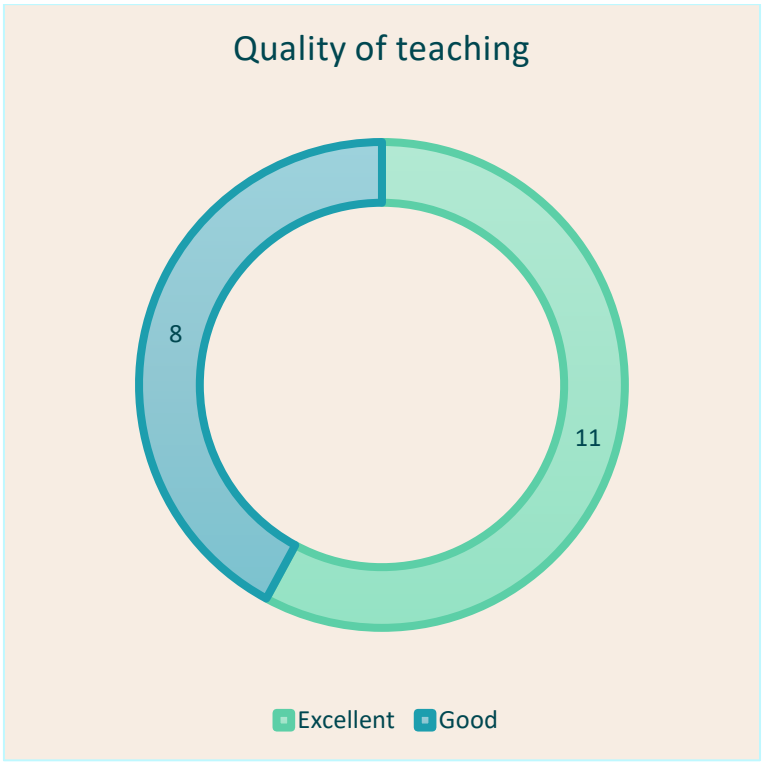
- Relevance of the topics covered
  All participants indicated that this GIS Course was relevant to their job.



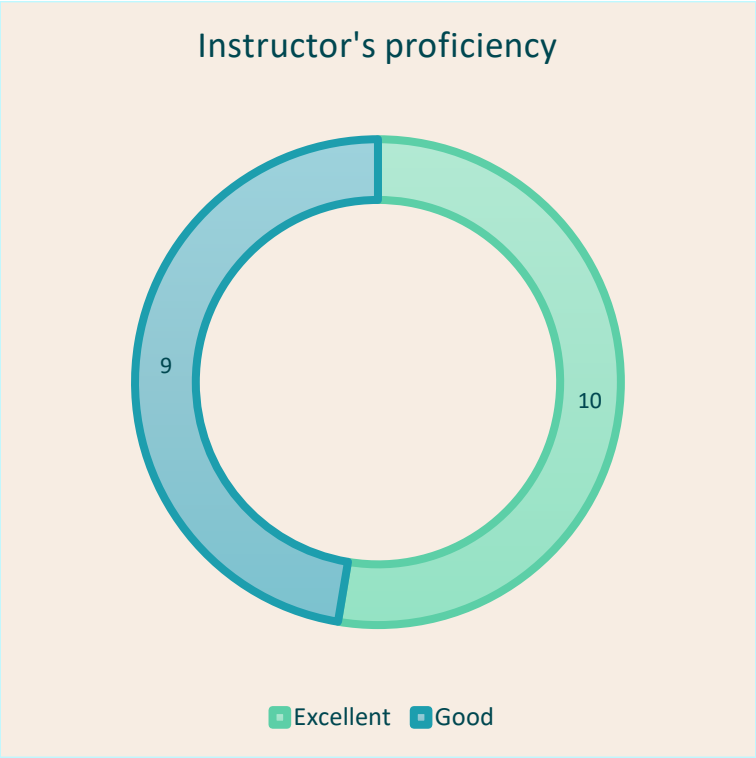
- Quality of course structure
  All participants were satisfied and expressed that the quality of the Course structure was Excellent (9) or Good (11).



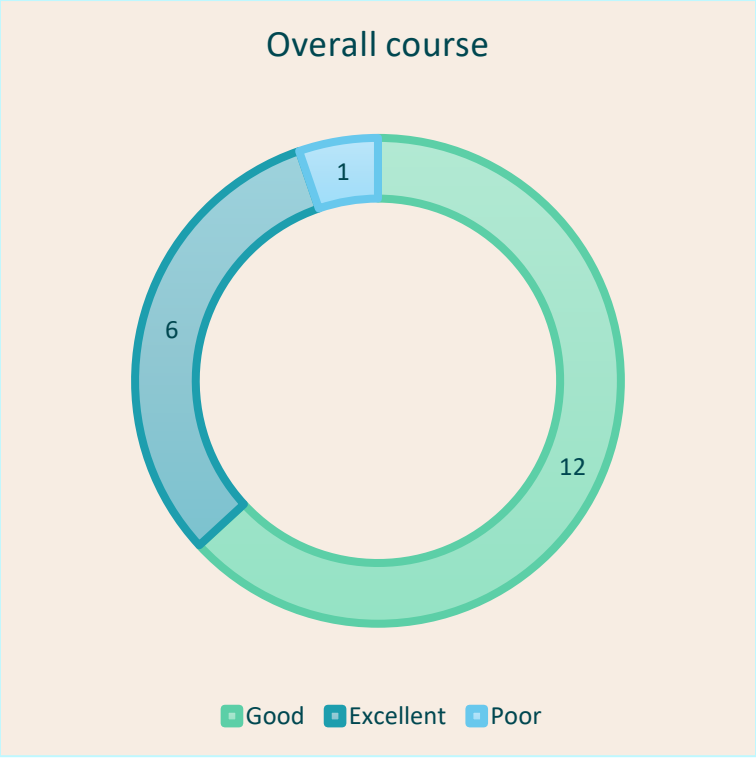
- Quality of teaching
  All participants were happy with the teaching quality and more than half stated that the instructor has an excellent quality of coaching.



- Instructor’s proficiency
  All participants were satisfied with the instructor’s proficiency and more than half of them confirmed that the instructor has an excellent proficiency in demonstrating GIS topics.



- Overall course rating
  Most of the participants rated the overall quality of the course as either Excellent or Good.



- Recommend the course to others
  The majority of participants (94%) were happy to recommend this course to their colleagues and friends.

- Qualitative feedback and suggestion

What did you like the most about the Course?	**How could this Course be improved?**
Interactive classroom	Extend it 10 days & add more practice options.
Hand on practice	With next level of GIS course training
QGIS features and kobo tools	More practical sessions would be good
able to participate in discussion	Length of class time should be increased
ODK, kobo tools box	Everything is good
Software practice	Need to arrange Course in physical, due to practical session need interaction and real field picture. Every participant well interacted in field, and it will better understand about ground situation.
Map selection, plotting, data export and buffering also using of kobo toolbox	Practically doing all what has been taught in the QGIS training by the guidance of instructor and together with participants.

Data collection tools like - kobo tools	some advance tools added on this course its more encourage others
Fantastic course, informative, well designed, clearly describes all the topics, the way of teaching is excellent, and participants were from different country.	course was very good, however if it would be made face to face rather than online it would be much better.
This course was very relevant to me, instructor made clear all the concepts of topics covered.	I think this course should be taken physically. I really struggled a lot while attending online.
Irwin Chavez was the facilitator. I liked his way of facilitation	Practical In Singapore is better for us
The course was important for us we can use it in the Entomology surveillance	before course it would be best to introduce all apps n materials of content just before session every individual should go through it then sessions will be started
Kobocollect and all files shared with us	More time may be two weeks will be ok for beginner like myself
Easy to locate problems on GIS for malaria vector control	In future need communication, need instructor help and response for solving any problem.
KoBo collect	Continue
Data collection tools is new technique for us, I hope our program will apply that tool. So that cause most effective for me.	
Maps	

Annexes

Annex 1: Agenda

Vector surveillance is critically important to guide vector control interventions and includes many activities such as adult and larval mosquito collections, mosquito identification, Insecticide Susceptibility monitoring, and others. In this course we focus on Geographic Information Systems that enable mapping, stratification and visualization of key data that assist in planning of control interventions. Subsequent courses later in the year will focus on other elements of vector surveillance.

Date	Time	Activities/Sessions
Aug 16	1300 – 1430	Fundamentals of Geographic Information Systems
	1430 - 1600	Introduction to QGIS and basic mapping
Aug 17	0900 - 1200	QGIS exercises (self-directed learning)
	1300 – 1400	Digital maps, spatial data, and sources of data
	1400 - 1500	Maps and projections
	1500 - 1600	Map layout in QGIS I
Aug 18	0900 - 1200	Mapping exercises I (self-directed learning)
	1300 – 1330	Discuss exercises/outputs
	1330 - 1600	Managing data for GIS
Aug 19	0900 - 1200	Data management/mapping exercises II (self-directed learning)
	1300 - 1330	Discuss exercises/outputs
	1330 – 1430	Mapping point data
	1430 – 1600	GIS-related tools - GPS

		- Data collection tools
Aug 20	0900 - 1200	Mapping exercises III (self-directed learning)
	1300 - 1330	Discuss exercises/outputs
	1330 - 1400	Google Earth
	1400 - 1530	Map layout in QGIS II
	1530 - 1600	GIS tips and tricks/Wrap-up

Annex 2: Instructor's Biography

Mr. Irwin F. Chavez

Irwin is currently employed as a Foreign Expert at the Faculty of Tropical Medicine, Mahidol University, in Bangkok, Thailand. He is the Associate Editor for the Southeast Asian Journal of Tropical Medicine and Public Health. Irwin received his tertiary education from the University of the Philippines for both his undergraduate Public Health and graduate Epidemiology degrees. Through grants from USAID, he was involved in pedagogical work with emphasis on capacity building of multidisciplinary students and professionals in Southeast Asia. He consulted for WHO's Mekong Malaria Elimination Programme (then Mekong Malaria Programme) as GIS specialist. He also contributed to the production of the Mekong Malaria Monograph III.

Irwin's professional interests include data analyses, vector-borne diseases, spatial epidemiology, drone mapping, and GIS. He has co-authored 21 articles on topics ranging from malaria, dengue, parasitic infections, and tools for surveillance and public health assessments. With over 15 years of work experience at Mahidol University, Irwin has served as GIS resource person in numerous training courses in the Philippines, Taiwan, Indonesia, Tanzania, Lao PDR, and Thailand to dozens of trainees.

Field of expertise: Epidemiology of infectious diseases; Statistical methods; Geographic Information Systems; Information and Computer Technology

Academic Qualification

2005 M.Sc. (Epidemiology) University of the Philippines Manila
1998 B.Sc. (Public Health); University of the Philippines Manila

Training

2002 Certificate of Merit for facilitating the Specialized Regional Field-based Training Programme in Epidemiology and Control of Tropical Diseases, Faculty of Tropical Medicine, Mahidol University, Thailand

Certificate of Merit for facilitating the Regional Basic and Advanced Training Course in Data Analysis, Faculty of Tropical Medicine, Mahidol University, Thailand

Research Appointments

2005 - Present Lecturer, Department of Tropical Hygiene, Faculty of Tropical Medicine, Mahidol University

2001 - 2004 Student/Researcher, Department of Tropical Hygiene, Faculty of Tropical Medicine, Mahidol University

2001 Field Supervisor, Department of Epidemiology and Biostatistics, College of Public Health, University of the Philippines Manila

1999 Research Assistant, Department of Epidemiology and Biostatistics, College of Public Health, University of the Philippines Manila

1998 Research Assistant, Department of Parasitology, College of Public Health, University of the Philippines Manila

Annex 3: Course Curriculum

CURRICULUM OF ONLINE COURSE ON GIS IN MALARIA VECTOR SURVEILLANCE
16-20 AUGUST 2021

Day 1 – Fundamentals of GIS
General objective: To understand the fundamental concepts of GIS.

Learning objectives	Content	Learning methods	Duration	Resources	Evaluation
Learn the basics of Geographic Information Systems	Fundamentals of GIS, examples, and applications	Lecture	60 minutes	Slide presentation, Mentimeter	Participation/ observation
Learn the fundamentals, features and file system used for digital maps	Fundamentals of digital maps and linked database(s)	Lecture	35 minutes	Slide presentation, video, digital maps,	Participation/ observation
Map projections	Map projections available in QGIS	Discussion and video presentation	15 minutes	Discussion and Youtube video	
Learn the basic functions and options in Quantum GIS	Instructions and demonstrations of basic functions and options in QGIS	Step-by-step demonstration	60 minutes	GIS software	Participation/ observation
Research on administrative levels by country	Homework instructions	Discussion	10 minutes		

Day 2 – Operating GIS Software
General objective: Acquire skills to use QGIS to map a location-based data

Learning objectives	Content	Learning methods	Time	Resources	Evaluation
Research on administrative levels by country	Tabulations of administrative level by country	Self-directed learning	180 minutes	Internet	

Present outputs from homework	Results of internet search by the trainees	Presentations	15 minutes	Presentations	Participation
Learn the basic functions and options in Quantum GIS	Instructions and demonstrations of basic functions and options in QGIS	Step-by-step demonstration	30 minutes	GIS software	Participation/ observation
Learn how to create maps using QGIS	Instructions and demonstrations of mapping elements and options in QGIS	Step-by-step demonstration	125 minutes	GIS software	Participation/ observation
Application of skills learned by creating region-/continent-level maps	Homework instructions	Discussion	10 minutes		Participation/ observation

Day 3 – Operating GIS Software (continuation)

Learning objectives	Content	Learning methods	Time	Resources	Evaluation
Apply skills learned by creating region-/continent-level maps	Region-/continent-level vector maps	Self-directed learning	180 minutes	GIS software, digital maps	Participation/ observation
Present outputs from homework	Maps created by the trainees	Presentations	20 minutes	Presentations	Participation
Learn how to create maps and layouts with essential elements using QGIS	Instructions and demonstrations of mapping elements and options in QGIS	Step-by-step demonstration	150 minutes	GIS software	Participation/ observation
Collect/research population data for data joining	Homework instructions	Discussion	10 minutes		

Day 4 – Data Joining, Mapping, and App-based Data Collection Tools

Learning objectives	Content	Learning methods	Time	Resources	Evaluation

Collect/research population data for data joining	Population data for countries in South America or African continent	Self-directed learning	180 minutes	Internet	
Present outputs from homework	Compare and validate population data for countries in South America or African continent	Discussion	10 minutes	Data table	Participation
Data inspection and joining data files to digital maps	Database functions in QGIS using collected population data	Step-by-step demonstration	20 minutes		Participation/ observation
Create thematic (quantitative) maps using basemaps with joined data	Graduated maps and symbols	Interactive lecture and demonstration	45 minutes		Participation/ observation
Introduce the trainees to app-based data collection tools	Instructions and demonstration to KoboCollect/OpenDataKit	Presentation and demonstration	20 minutes	Handout, video tutorial	Observation
How to setup projects and create forms in KoboCollect	Setting up KoboCollect projects and creating forms; Types of variables possible	Step-by-step demonstration	75 minutes	KoboToolbox, handout, tutorial	Project forms created
Setup personal a personal account in KoboToolbox, create a project, and develop a simple form	Homework instructions	Discussion	10 minutes	KoboToolbox	

Day 5 – Data Collection using KoboCollect, Exporting Data, and Mapping

General objective: To learn processes involved in developing location-based data collection tools for use in the field.

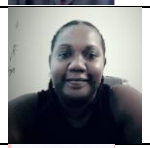
Learning objectives	Content	Learning methods	Time	Resources	Evaluation
Setup personal a personal account in KoboToolbox, create a project, and develop a simple form	KoboToolbox account and/or KoboCollect project/data collection form	Self-directed learning	180 minutes	KoboToolbox and KoboCollect app	
Present homework outputs	Data collection form	Presentation and discussion	30 minutes		Participation

Learning objectives	Content	Learning methods	Time	Resources	Evaluation
Learn the steps in processing and exporting collected data	Instructions for data processing and converting data into formats compatible with QGIS	Step-by-step demonstration	45 minutes	KoboToolbox, QGIS, exported data	Participation/ observation, exported data files
Apply skills learned to map collected data	Instructions for creating maps and concepts for GIS analysis	Step-by-step demonstration	45 minutes	QGIS, exported data	Participation/ observation, generated maps
Learn basic geoprocessing: buffer zones	Geoprocessing tools in GIS	Step-by-step demonstration	30 minutes	QGIS, exported data	Participation/ observation
Course wrap-up	Total course content	Discussion	30 minutes		

Annex 4: Participant list

Name	Photo	Email	Position	Country	Gender
Dr Sunti Maithaviphet		stmtvp2013@gmail.com	Malaria and dengue vector control	Lao PDR	Male
Mr A M Touhid Hasan		touhidhasanshuvro@gmail.com	Entomological Surveillance Expert	Bangladesh	Male
Mr Mehedi Anam		mehedianamtopu@gmail.com	Entomological Surveillance Expert	Bangladesh	Male
Mr Mohammad Ali		mdali.ento@gmail.com	Entomological Technician	Bangladesh	Male
Mr Md Shariful Islam		sharifulshahid.bd@gmail.com	Entomological Technician	Bangladesh	Male
Ms Jannatul Ferdous Tithi		tithijannat90@gmail.com	Entomological Surveillance Expert	Bangladesh	Female
Mr Uttam Raj Pyakurel		uttamrajpyakurel@gmail.com	Vector Control Inspector	Nepal	Male

Mr Chogyal Namgyel		cnamgyel@health.gov.bt	HMIS IT	Bhutan	Male
Mr Phurpa Tenzin		tenzin.47pt@gmail.com	Asst. Data Manager	Bhutan	Male
Ms Karma Choden		karmachoden1113@gmail.com	GIS Technician	Bhutan	Female
Dr Dui Bui Le		builedu yhnnimpe@gmail.com	Researcher	Vietnam	Male
Mr Jaipal Singh		sjaipal85@yahoo.com	Public Health Entomologist	Pakistan	Male
Ms Samina Baloch		uzoology@yahoo.com	Entomologist	Pakistan	Female
Mr Manuel Gusmao		gusmao.ento@gmail.com	The National Senior Entomologist for Malaria	Timor Leste	Male
Mr Noor Halim Safi		abdulmajidnoor2009@yahoo.com	Medical Entomology officer	Afghanistan	Male

Mr Jimmy Isamate		jimmyisamate@gmail.com	Senior Vector Control officer	Solomon Island	Male
Mr Rolex Havea		Rolex.Havea@moh.gov.sb	Senior Vector Control Officer	Solomon Island	Male
Mr Simon Tebonia		tebonyye@gmail.com	Monitoring and Evaluation Officer	Solomon Island	Male
Ms Joy Kaimauri		jojokakai@gmail.com	Field Officer	Solomon Island	Female
Ms Shally Leotina		sleotina09@gmail.com	Monitoring and Evaluation Officer	Solomon Island	Female