OHSEA trainings on Mapping and spatial analyses

in Phnom Penh, Cambodia

- **Objective:** Develop the use of geospatial technologies and methodologies for One Health studies

- **Needs identified:**

    => Build capacity for specific needs in remote sensing (satellite image analysis)

    => Train on using R software for mapping and spatial analyses

- **Organized by:**

    - GeoHealth Team (IRD - Espace-Dev, IPC), in collaboration with Florian Girond (ETI CDC-IPC)

    - Khmer Earth Observation Laboratory (KHEOBS) at Institute of Technology of Cambodia (ITC)

- **Opportunity of a co-funding**, in the frame of the Dissemination activities of the EASIMES (Environment Analysis and Surveillance to Improve Malaria Elimination Strategy) project funded by the Global Fund

    => Possibility to increase the number of regional participants and trainers

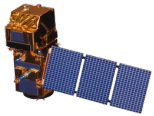Jun > Jul > Aug > Sept > Oct > Nov > Dec

22nd – 24th June 2022
Training on Earth
observation for hydrology
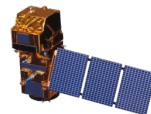and land cover mapping

28th Nov – 2nd Dec 2022 :
Training on Geospatial analyses
for One Health studies

5th Dec 2022 :
Symposium on Geospatial analyses
for One Health studies

7th - 9th Dec 2022
Training on the monitoring of
environmental dynamics by
remote sensing

- **22nd – 24th June 2022: Training on Earth observation for hydrology and land cover mapping**

  - 3 days of theoretical courses and practical work

  - Use of Sentinel-1 images (RADAR), SNAP and QGIS

  - 24 participants in Cambodia (ITC, IPC, IRD, Royal University of Agriculture, National Univ. of Battambang)

  - Cofunding: French Embassy Cambodia + Espace-Dev

- **7th - 9th Dec 2022: Training on the monitoring of environmental dynamics by remote sensing**

  - 3 days of theoretical courses and practical work

  - Use of Sentinel-2 images (optical), Sen2Chain & Sen2extract and eCognition

  - 26 participants from 6 countries, including 5 Southeast Asian countries

  - Cofunding: EASIMES (Global Fund)

- 47 registrations of interest
    - ⇒ selection of 15 participants
        - ⇒ to represent different countries and institutions
        - ⇒ Based on motivation and level in data analysis

- 8 participants proposed linked to malaria programs

23 Participants (10 Females, 13 Males), 7 countries, 14 institutions:

- **8 participants from Cambodia:**
    - National Institute of Public Health (NIPH)
    - Institut Pasteur du Cambodge (IPC)
    - University of Health Sciences
- **1 from Indonesia:** National Research and Innovation Agency of Indonesia (BRIN)
- **3 from Laos:**
    - Center for Malariology, Parasitology and Entomology (CMPE),
    - National University of Laos (NUoL)
- **3 from Myanmar:**
    - Save the Children International,
    - Myanmar Health Assistant Association (MHAA)
- **3 from Thailand:**
    - Ministry of Public Health,
    - Mahidol University
- **4 from Vietnam:**
    - National Institute of Hygiene and Epidemiology (NIHE),
    - National Institute of Malariology, Parasitology and Entomology (NIMPE)
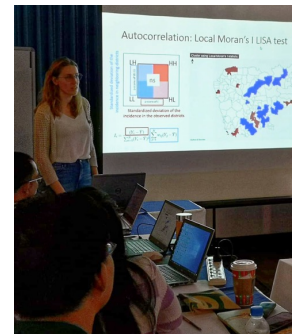   - Pasteur Institute in Ho Chi Minh city
- **1 from France:** IRD- Espace-Dev

+ 6 trainers from France and Cambodia: IRD-IPC GeoHealth Team + CNRS UAR RIATE

Training on Mapping and spatial analyses in R for One Health studies

	Monday 28th November	Tuesday 29th November	Wednesday 30th November	Thursday 1st December	Friday 2nd December
	Introduction to R	*Mapping in R*	*Geoprocessing in OSM*	*Using OSM and raster data in R*	*Applied exercises in R*
8H30-10H00	Arrival of foreign participants in Phnom Penh	**Lecture 1: Contribution of mapping and spatial analysis in epidemiological studies and health surveillance (Vincent Herbreteau)** **Practical 2: Make a simple map in R** (Chapter 5.1)	**Practical 4: Map layout in R** (Chapter 5.2)	**Focus on applications: Introduction to geostatistics (Léa Douchet)** **Practical 6: Data acquisition** (Chapter 2.1)	**Practical 9: Applied exercises**
Coffee break					
10H30-12H00		**Practical 2: Make a simple map in R** (Chapter 5.1)	**Practical 5: Using vector data in R (Chapter 3)**	**Lecture 3: Introduction to OpenStreetMap (OSM) (Lucas Longour)**	**Practical 9: Applied exercises**
Lunch					
13H30-15H00	Workshop introduction	**Lecture 2: Graphic semiology (Timothée Giraud)** **Practical 3: Thematic map in R** (Chapter 5.1.2 to 5.1.6)	**Focus on applications: Do's and don'ts when mapping (Timothée Giraud)** **Practical 5: Using vector data in R** (Chapter 3)	**Practical 7: Import OSM data** (Chapter 2.3)	**Practical 9: Applied exercises**
Coffee break					
15H30-17H00	**Practical 1: Introduction to R (refresher course)**	**Practical 3: Thematic map in R** (Chapter 5.1.2 to 5.1.6)	**Practical 5: Using vector data in R** (Chapter 3)	**Practical 8: Using raster data in R** (Chapter 4)	**Final discussion about future interactions among participants Awarding of certificates**

Tutorial were shared online as open-source: http://rspatial4onehealth.geohealthresearch.org/

=> can be re-used by anybody
=> can be also completed by anybody
=> will be updated by our GeoHealth team

Mapping and spatial analyses in R for One Health studies

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GeoHealth Training Series

Preface

IRD-IPC Ge🌐Health Lab
IRD-IPC ព័ត៌មានភូមិសាស្ត្រ និង សុខាភិបាល

This training is designed for people interested in using R for mapping and spatial analysis for applications in the various fields related to "one health" approaches. R is an open source software widely used by the scientific community for data analysis and which is becoming an interesting choice for cartography and spatial analysis, as a Geographic Information System.

This training was first prepared to be given from 28th November to 2nd December 2022, in Phnom Penh Cambodia, by the GeoHealth team under the French National Research Institute for Sustainable Development (IRD) and the Institut Pasteur du Cambodge (IPC), in the frame of:

- the OHSEA Project (One Health in Practices in South-East Asia), funded by the FSPI (Solidarity Fund for Innovative Projects) under the French Ministry for Europe and Foreign Affairs,

- the Dissemination activities of the EASIMES (Environment Analysis and Surveillance to Improve Malaria Elimination Strategy) Project funded by the Global Fund RAI2E.

Conception: It was first designed from the courses "Géomatique avec R" and "Cartographie avec R" by Timothée Giraud and Hugues Pecout. It was then translated and its examples were adapted for Cambodia and health applications.

- **59 participants**

- **8 countries**, including 6 Southeast Asian countries

- **15 oral presentations** organized in 4 sessions

- **Symposium website:**

    - Registration

    - Shared presentations

    - Shared pictures

https://geoonehealth2022.sciencesconf.org/
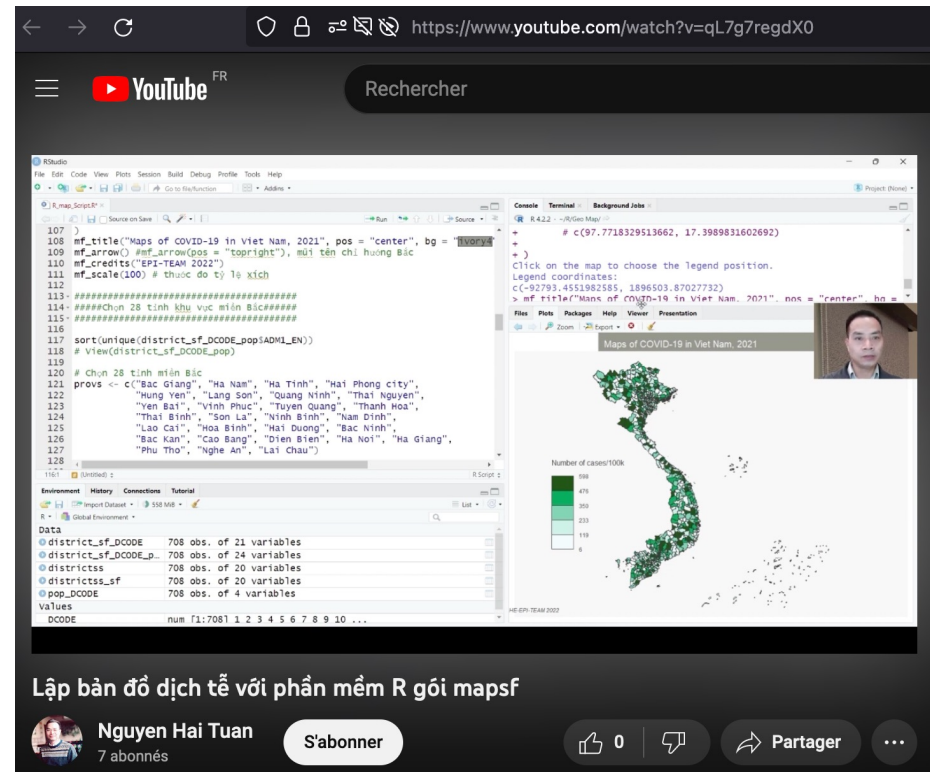
- As expected, **a high demand for practical training for mapping with R:**
  - ⇒ the selection allowed us to ensure the required level of the participants and their motivation
  - ⇒ importance of having a sufficient number of supervisors in view of the technical nature of the training and the large number of participants

- **Importance of sharing as open-source:**
  - ⇒ One participant, Dr Nguyen Hai Tuan from NIHE, reinterpreted the training for Vietnam and shares a video record.

- **What's next?**
  - ⇒ Desire to maintain exchanges, further develop learnings, maintain a SEA technical network related to spatial analyses for health

- **OHSEA project coordinators**

- **Funders:**
    - FSPI (Solidarity Fund for Innovative Projects) under the French Ministry for Europe and Foreign Affairs,
    - Global Fund
    - French Embassy in Cambodia

- **IRD Representative offices for organizing regional missions**