

# Cirad-FVI capacity Building Platform for Livestock Management and Animal Health in the Global South





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Capacity Building Platform  
For Livestock Management and  
Animal Health in the Global South

Graduating  
courses



Modular  
trainings



E-learning



We also offer tailor-made courses in Montpellier or in your own country.  
Do not hesitate to contact us to build together trainings adapted to your  
needs, in French, English or Spanish.

### Registration:

Plateforme mixte Cirad -FVI  
Formation en élevage et santé animale aux Suds  
TA A-117/E Campus International de Baillarguet  
34398 Montpellier Cedex 5 - France  
Tel : +33 (0)4 67 59 39 02 / E-mail : [formation-emvt-fvi@cirad.fr](mailto:formation-emvt-fvi@cirad.fr)

### For further information:

<http://formation-elevage-suds-cirad.fr>





The joint CIRAD/FVI platform, “Capacity Building for Livestock Management and Animal Health in the Global South”, is developing an international training offer, particularly in Southern countries, drawing on the expertise of FVI members and CIRAD research units.

This work is being carried out by France Vétérinaire International (FVI) in collaboration with 4 CIRAD research units working on animal production and health:

- (Astre) Animals, Health, Territories, Risks and Ecosystems
- (Selmet) Mediterranean and Tropical Livestock Systems
- (Isem) Montpellier Institute of Evolutionary Sciences
- (INTERTRYP) Host-Vector-Parasite-Environment Interactions in Neglected Tropical Diseases due to Trypanosomatids.

### Training courses adapted to needs

Our degree and skills-training offer includes:

- ✓ first and second year Masters programs,
- ✓ 1 to 4 week module-based training courses,
- ✓ distance learning courses,
- ✓ customized training courses.

Courses are mainly organized at CIRAD on the Baillarguet International Campus in Montpellier (France), but can be relocated abroad.

They are delivered primarily in French but sessions in English can be organized on request.

A large range of individuals are involved in the courses, with extensive contributions from senior scientists at CIRAD and its partners (members of FVI, INRA, ENVA, ENVt, IRD, FAO, OIE, GDS, ANSES...).

➤ *These products are built each year around animal production and health, and are oriented to countries in the southern hemisphere.*

### Tools and materials available

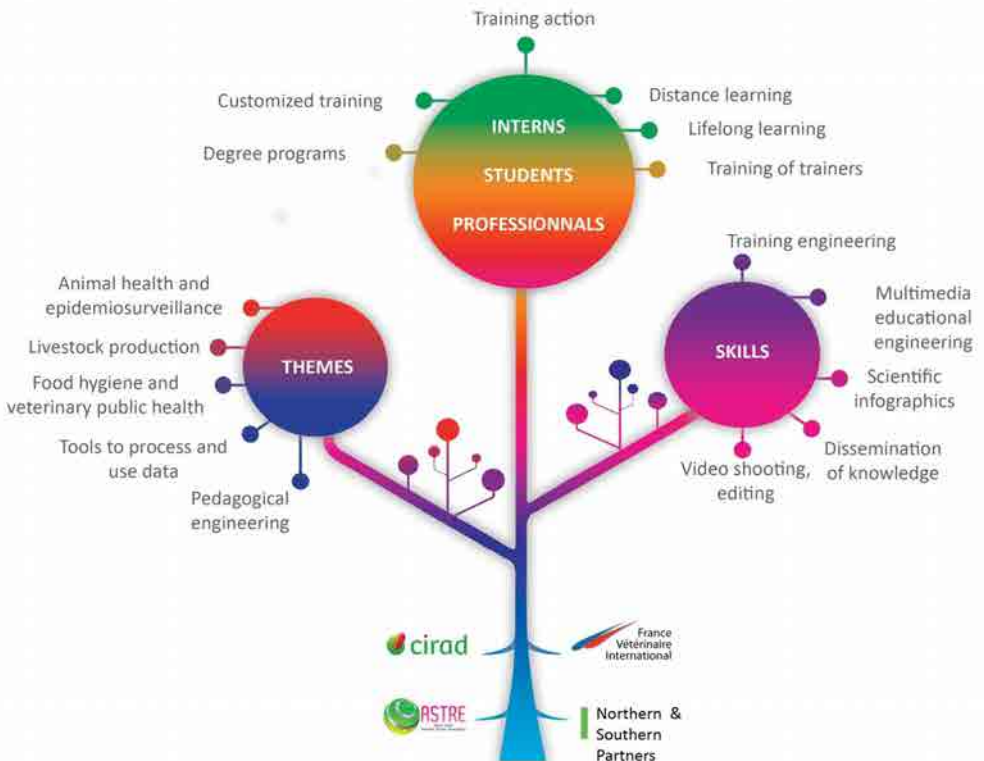
- 2 training rooms
- 1 computer room (22 computers)
- Videoconferencing equipment
- Interactive learning material
- Script writing software
- Animation and computer graphics software
- Content creation software in e-learning
- Publication software, site creation,...
- Distance Learning Platform (LMS)
- Audio and video capture set (cameras, editing station, drone)





## Products and services

- ✓ Welcoming students from the North and South
- ✓ Reception of international delegations and Southern partners
- ✓ Supervision of field placements and internships in Southern countries
- ✓ Training engineering to set up international masters and customized training programs
- ✓ Organization of workshops, conferences, simulation exercises...
- ✓ Development of innovative training products (e-learning, MOOCs...)
- ✓ Creation of brochures, posters, educational kits...
- ✓ Creation of logos, graphics, public information and educational illustrations
- ✓ Production of teasers, educational films, video courses







# Program 2019-2020

## Graduating courses

### In France

#### Animal health and epidemiological surveillance

- September 2019 to June 2020 : **Master SEMHA « Epidemiological surveillance of human and animal diseases »**
- September 2019 to July 2020 : **Master GIMAT « Integrated management of tropical animal diseases »**
- September 2019 to January 2020 : **Postgraduate certificate (CES) in animal epidemiology**

### Abroad

- August 2019 to June 2020 : **Master InterRisk « Assessment and management of health risks at the human, animal and ecosystem interface »**
  - <http://www.onehealthsea.org/interrisk>

September 2019 to June 2020

This Master's degree specialization is organized by the National Veterinary School of Alfort (ENVA), the University of Paris Sud-Saclay, the University of Paris Est, and the Center for International Cooperation in Agronomic Research for Development (Cirad). The course trains participants in the primary methods for creating, facilitating and participating in an Epidemiological Surveillance Network of Human and Animal Diseases. It is a specialization taken in the second year (M2) of the Master of Public Health program. In addition to teachers and researchers from the organizing institutions, professionals from various agencies participate in the training, such as the French Agency for Food, Environmental and Occupational Health and Safety (ANSES) and Santé Publique France. Numerous conferences also are organized with the Institute of Research for Development (IRD), General Directorate for Food (DGAL), Pasteur Institute, livestock health protection groups (GDS), World Organisation for Animal Health (OIE), Food and Agriculture Organization (FAO), Agronomists and Veterinarians Without Borders (AVSF), the French National Institute for Agricultural Research (INRA)...

## Course objectives

By the end of the course, participants should be able, in the field of epidemiology applied to the surveillance of human and animal diseases, to:

- present and use specific procedures of descriptive epidemiology, analytical epidemiology and evaluative epidemiology;
- use current tools of epidemiology (information technology, bio-statistics, risk analysis and geographic information systems);
- participate effectively in the various stages of an epidemiological survey, from drafting protocols to analysing data;
- contribute to epidemiological surveillance activities: establish specifications for the development of a disease surveillance plan and develop a training plan for network actors; facilitate epidemiological surveillance activities; manage and process epidemiological surveillance data in both public and animal health (especially for vector-borne diseases);
- contribute to the evaluation of epidemiological surveillance networks;
- provide an epidemiological contribution to the preparation, implementation and evaluation stages of disease control programs;
- use risk analysis and geographic information systems.

## Cost

- Single registration: €1 680
- Veterinary student: €840
- Professional training: €5 500



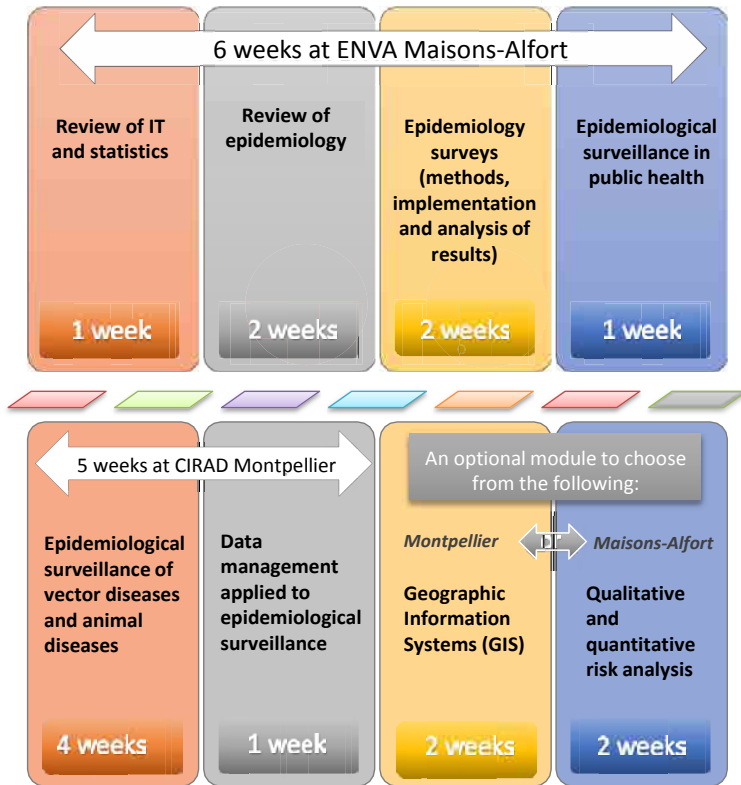
## Program

Theoretical and practical instruction is provided full-time over 4.5 months, with courses divided between Maisons Alfort and Montpellier. A 5.5 month internship on a concrete epidemiological surveillance project within a professional structure then follows.





From September to January



From January to June

**5.5 month end-of-studies professional internship**

## Admission and registration

Applicants either must hold a Bac +4 degree or the equivalent in the field of health sciences, or be able to demonstrate sufficient professional experience.

The pre-registration form is available on the site: <http://aeema.vet-alfort.fr> under "Enseignements", followed by "CES-Master". It must be completed carefully and returned by email to [barbara.dufour@vet-alfort.fr](mailto:barbara.dufour@vet-alfort.fr).

A detailed and personalized estimate can be obtained on request.

**No application will be considered after 14 June 2019 (date of receipt of the application).**

## Funding

The institutions organizing the master's program cannot provide scholarships. Admission to M2 (second year of the master's program) does not mean that a scholarship will be awarded to successful applicants.

**Important :** Without waiting for admission to the program, foreign applicants should apply as soon as possible for funding from the competent national authorities in charge of livestock and/or the granting of scholarships, Cooperation and Cultural Action Services of French Embassies (SCAC), embassies of other countries, international organizations (FAO, UNDP, European Union, IAEA, IDB...), development projects or non-governmental organizations...

*CIRAD is an OIE collaborating center for the diagnosis and control of animal diseases in tropical areas.  
The organization of training courses in this field is part of its mandate.*

### September 2019 to January 2020

The National Veterinary School of Alfort (ENVA), in collaboration with the Center for International Cooperation in Agricultural Research for Development (Cirad, Montpellier), offers a postgraduate certificate in epidemiology (CES). The course, which leads to a degree from ENVA, trains participants in the primary methods for creating, facilitating and participating in an epidemiological surveillance network of animal diseases.

In addition to teachers and researchers from the organizing institutions, professionals from various agencies participate in the training, such as the French Agency for Food, Environmental and Occupational Health and Safety (ANSES) and Santé Publique France. Numerous presentations also are organized with the Institute of Research for Development (IRD), General Directorate for Food (DGAL), Pasteur Institute, livestock health protection groups (GDS), World Organization for Animal Health (OIE), Food and Agriculture Organization (FAO), Agronomists and Veterinarians Without Borders (AVSF)...

Theoretical and practical instruction is provided full-time over 4.5 months between Maisons Alfort and Montpellier, followed by an internship with a minimum duration of 2 weeks.

Participants must be released from all professional obligations.

## Course objectives

By the end of the training, participants should be able, in the field of epidemiology applied to communicable diseases, to perform the following tasks:

- present and use the specific procedures of descriptive epidemiology, analytic epidemiology and evaluative epidemiology;
- use existing epidemiological tools (information technology, bio-statistics...);
- participate effectively in different stages of an epidemiological investigation covering a single outbreak, a set of outbreaks, or a region;
- contribute to epidemiological surveillance activities, in particular to develop specifications for the creation of an epidemiological surveillance network, establish a training plan for the actors of a network, and conduct epidemiological surveillance activities;
- manage and process data generated by epidemiosurveillance;
- perform technical and economic assessments of epidemiological investigations and contribute to those of an epidemiological surveillance network;
- provide an epidemiological contribution to the preparation, implementation and evaluation stages of disease control programs;
- use risk analysis and geographic information systems.



## Cost

- Single registration: €2 000
- Professional training: €5 500

## Admission and registration

Applicants must either hold a Bac +4 degree or the equivalent in the field of health sciences, or be able to demonstrate sufficient professional experience.

Application files can be downloaded from the website: <http://aeema.vet-alfort.fr>, under "Enseignements" followed by "CES/Master".

They must be carefully completed and returned by email ([julie.riviere@vet-alfort.fr](mailto:julie.riviere@vet-alfort.fr)) **before 14 June 2019** accompanied by a letter of motivation in French.



**This CES may be completed over one, two, or at most three years of study.**

## Funding

The institutions organizing the CES's program cannot provide scholarships. Admission to CES does not mean that a scholarship will be awarded to successful applicants.

**Important :** Without waiting for admission to the program, foreign applicants should apply as soon as possible for funding from the competent national authorities in charge of livestock and/or the granting of scholarships, Cooperation and Cultural Action Services of French Embassies (SCAC), embassies of other countries, international organizations (FAO, UNDP, European Union, IAEA, IDB...), development projects or non-governmental organizations...



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September 2019 to July 2020

The National Veterinary School of Toulouse and the University Toulouse III Paul Sabatier, in collaboration with the Center for International Cooperation in Agricultural Research for Development (Cirad, Montpellier), offer this Master's specialization on "Integrated Management of Tropical Animal Diseases". The course prepares graduates for positions as consultants, project managers and study coordinators in the public (regional, national and international health agencies) and private (pharmaceutical and agro-food industries, livestock breeding centers) sectors. They may also pursue a career in scientific research by continuing with a PhD program.

## Course objectives

### Scientific objectives

Develop expertise in the management of animal diseases and population health to be able to propose methods for the prevention and control of tropical animal diseases. These methods are part of an interdisciplinary approach to epidemiological systems.

### Professional objectives

- Train specialists in the risks of emergence and spread of animal and zoonotic diseases in Mediterranean and tropical countries
- Train animal health epidemiology researchers

By the end of the program, participants will be able to:

- identify and describe animal diseases in tropical systems;
- describe, compare and analyze the health of populations;
- set up prevention and control measures for tropical animal diseases;
- take into account relevant environmental and socio-economic parameters in a One Health approach.

The skills acquired during this training program can be used effectively in countries of the North and South.

## Audience

The GIMAT master's program welcomes veterinarians who hold a DEFV (Diplôme d'Etudes Fondamentales Vétérinaires/Diploma of Fundamental Veterinary Studies) and individuals with other educational backgrounds (agri-food or agricultural engineering schools, pharmacists, university graduates who have completed the first year (M1) of a master's program in biological sciences, other degrees deemed equivalent by the master's teaching committee). Applications from foreign students and professionals with equivalent degrees are also welcome.

Most of the program is taught in French, but some articles and presentations also require an intermediate level in English.



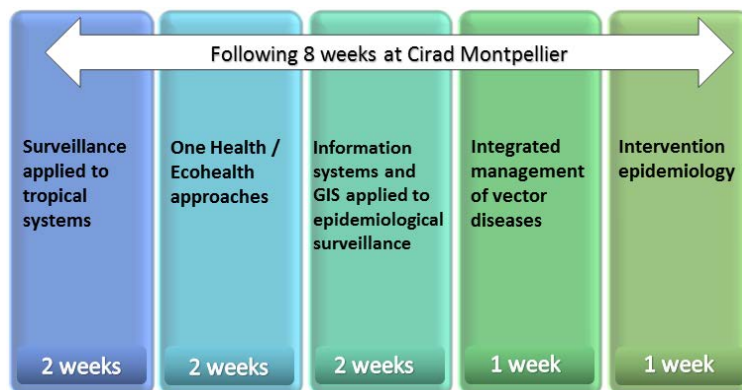
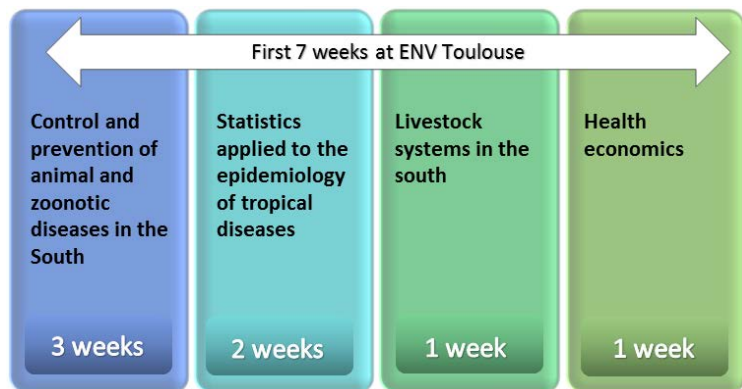
# Program



The applied theoretical training program begins with common core courses given in two locations (Toulouse and Montpellier). It is supplemented by hands-on training in the form of a 5.5 month internship in a structure approved by the teaching committee, in France or abroad.

This internship is validated by a written report followed by an oral presentation.

From September to January



From January to mid-June



Graduating course

# Applications



## You are French or an international student currently in France:

Send your CV and a letter of motivation in French to [dep@envt.fr](mailto:dep@envt.fr)

## You are foreign, not currently in France:

Check if your residence country falls under the Campus France procedure by consulting the list of countries on the following website: <https://www.campusfrance.org/fr/procedure-etudes-en-France>

- If this is the case, it is advisable to start the process a year in advance. Select the "Biologie Santé" (Health Biology) Master at Toulouse III Paul Sabatier University, GIMAT Specialisation, M2.

In parallel, send your CV and letter of motivation in French to [formation-emvt-fvi@cirad.fr](mailto:formation-emvt-fvi@cirad.fr)

- If your country does not fall under the Campus France procedure, send your CV and letter of motivation in French to [formation-emvt-fvi@cirad.fr](mailto:formation-emvt-fvi@cirad.fr)

**No registration will be accepted after 27 May 2019.**

## Costs

- Veterinary student at a French national veterinary school holding a DEFV (fundamental veterinary studies diploma): tuition fees in effect for the year following the initial veterinary training (registration at ENVT, the institution organizing the course for the Biology-Health specialization of the University of Toulouse)

+ registration fees for the second year (M2) of the master's program.

- Other students: registration fees for the second year (M2) of the master's program.

- Professional training:

Funded by a donor agency: €7 000;

Self-funded or individuals seeking employment: €3 350

- Foreign professional (veterinarian or equivalent diploma): registration fees in M2 + €4 800 in tuition fees if supported by a funding agency.



## Funding

The institutions organizing the master's program cannot provide scholarships. Admission to M2 (second year of a master's program) does not mean that a scholarship will be awarded to successful applicants.

### Important :

Without waiting for admission to the program, foreign applicants should apply as soon as possible for funding from the competent national authorities in charge of livestock and/or the granting of scholarships, Cooperation and Cultural Action Services of French Embassies (SCAC), embassies of other countries, international organizations (FAO, UNDP, European Union, IAEA, IDB...), development projects or non-governmental organizations...



See our other trainings : <http://formation-elevage-suds.cirad.fr>

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Graduating course





Program 2019-2020

## Modular trainings

### Food Safety and Veterinary Public Health

- **20 to 31 January 2020:** Food Safety and Veterinary Public Health in the South

### Animal health and epidemiological surveillance

- **16 to 27 Mars 2020:** Integrated management of wildlife and associated health risks the Global South
- **1st to 12 April 2019:** Qualitative Risk Mapping Analysis  
Optimization of monitoring systems on transboundary diseases
- **Between October and April 2019:** Principles of animal cell culture workshop
- **28 October to 22 November 2019:** Methodology of epidemiological surveillance
- **Date to determine depending on the request:** Diagnostic techniques for CBPP (and/or CCPP)
- **18 to 21 November 2019:** Diagnostic techniques for Peste des petits ruminants
- **12 to 22 November 2019:** One Health and Integrated Health Approaches
- **9 to 13 December 2019:** Ecology and Integrated Vector Control
- **16 to 20 December 2019:** Outbreak intervention
- **June or October 2019 :** Animal mobility





# Program 2019-2020

## Modular trainings

### Livestock production

- **18 September to 14 October 2019:** Livestock systems in the world: Dynamics and Analysis Tools
- **17 October to 7 November 2019:** Pastoralisms

### Tools to process and use data

- **26 to 28 June 2019 :** Interactive R: building web applications with Shiny
- **16 - 20 December 2019:** From Field Data to Online Maps
- **25 - 29 November 2019:** Data Management applied to Epidemiological Surveillance
- **25 November - 13 December 2019:** Information Systems applied to Epidemiological Surveillance
- **2 - 13 December 2019:** GIS applied to Epidemiological Surveillance
- **14 - 18 October 2019:** Applied training: Bases in Statistical Analyses with R

### Pédagogical engineering

- **date to determine depending on the request:** Engineering e-learning training



# Food Safety and Veterinary Public Health in the South

(Delivered in French)

Scientific coordinator

E. CARDINALE  
(Cirad UMR ASTRE)



**2 weeks**  
**20-31 January 2020**

Questions concerning quality in animal production chains are becoming increasingly important from the perspective of both public health (fight against the contamination of consumers) and economics (lifting of export restrictions).

Following episodes involving mad cow disease, listeria in pregnant women, and E. coli O157: H7, which causes bloody diarrhea in children, consumers around the world are more than ever concerned by the quality of the food on their plates.

In a context of growing urbanization, many countries in tropical and semi-tropical regions are developing intensive farming and short supply chains to feed urban consumers. Street restaurants are flourishing, especially in capital cities. Some countries are also seeking to develop tourism and hospitality services.

However, quality has different dimensions that must be understood. It is built over the entire value chain, from the production stage to processing and delivery to consumers. Research to improve quality therefore requires the implementation of appropriate methods and tools as part of a comprehensive approach integrating the different levels of the industry and all of the stakeholders.

This module aims to provide participants the necessary skills to implement this approach in the main livestock production sectors in tropical and semi-tropical regions, using lessons, case studies and site visits.

## Course objectives

At the end of the course, participants will be able to :

- make a diagnosis at the level of an animal production chain;
- implement quality control methods at different levels of an animal production chain;
- propose measures related to methods and the organization of quality control to strengthen the reliability of official control services;
- advise agribusinesses about food assurance and food safety as well as the assessment and management of risk;
- contribute to the development of a mechanism or legislative and regulatory framework compatible with international standards, in particular those of the European Union;
- enhance the quality approach in animal production sectors.

# Audience

This course is open to veterinarians, agronomists and engineers working in the fields of hygiene and quality of food of animal origin who wish to strengthen their skills. It also may be taken by individuals who do not belong to these categories but have sufficient professional experience.

Candidates must have a good command of French.



This module is shared with the master's programme « Livestock systems » (Masters 3A)

## Partnerships

With the participation of the National Veterinary School of Alfort, National School of Veterinary Services, the UMR Qualisud CIRAD and the Ministry of Agriculture.

## Cost

- Training course : €1,300
- Travel to Montpellier : to be determined by the participant
- Housing expenses : allow a minimum of about €90/day

If necessary, a customized estimate can be established upon request, especially when two or more courses are followed.

## Important

CIRAD cannot provide study grants. If you wish to request a grant, submit an application as soon as possible to national authorities in charge of livestock and/or scholarships; Cooperation and Cultural Action Services (SCAC) of your local French Embassy; the embassies of other countries; international organizations (FAO, UNDP, EU, IAEA, IDB ...); development projects or NGOs.

## Application procedure

Applications, consisting of a detailed resume, a motivation letter and details about the organization managing your grant, must be sent if possible before

**13 December 2019**

by email to: [formation-emvt-fvi@cirad.fr](mailto:formation-emvt-fvi@cirad.fr)



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**CIRAD-FVI – Capacity Building Platform for Livestock Management and Animal Health in the Global South**  
[formation-emvt-fvi@cirad.fr](mailto:formation-emvt-fvi@cirad.fr)



## Program (indicative)

- Framework and context (standards, precautionary principle, costs, quality brands...)
- Tools to control sanitary quality (HACCP, ecopathology, risk analysis, training...)
- Chain analysis (milk, meat, monogastrics, fish...)
- Official control services (organization of services, methods for official control)
- Case studies (group work, scenario)
- Pedagogical movies (on transformation and distribution sites)



# Integrated management of wildlife and associated health risks the Global South

(Training delivered in French)

Scientific coordinator:

F. JORI

(Cirad UMR ASTRE)

2 weeks

16 to 27 March 2020



Natural ecosystems provide essential services to rural communities in countries in the southern hemisphere. Their biodiversity often represents sources of water, food, essential nutrients, medicine, fuel, energy, livelihoods and irreplaceable cultural and spiritual enrichment which have a fundamental impact on human health.

However, this biodiversity is currently facing major transformations (climate change, deforestation, overexploitation of natural environments, heightened trade) that are fostering increasingly frequent interactions between wildlife, domestic animals and humans. These interactions facilitate exchanges of pathogens between these different host compartments and can precipitate the emergence of infectious diseases that can have a colossal impact on livestock, public health and the conservation of endangered species.

Consequently, the number of emerging infectious diseases that have an epidemiological link with wildlife has greatly increased in recent decades, promoting the emergence of major health crises, locally and internationally (avian influenza, Ebola, HIV). These diseases reflect interactions between different hosts (pathogens, vectors, animals, humans) in a context of complex and interlocking socio-ecosystems, highlighting (i) the importance of wildlife in the socio-ecosystems of countries of the South, ii) the health risks linked to the use of wildlife on human and animal health, and iii) the relevance of a multidisciplinary and integrated approach to understand the risks of emergence of wildlife-related diseases in complex socio-ecosystems.

## Training objectives

This training course offers an overview of the integrated management of wildlife and health risks inherent in interactions between wildlife species, domestic species and humans, taking the perspective of different disciplines, such as ecology, epidemiology, sociology and economics.

The course aims to:

- present the various wildlife use and management systems existing in countries of the South and the health risks related to these use practices;
- convey a multidisciplinary vision of socio-ecosystems' functioning and its relationship with disease emergence;
- demonstrate the importance of an integrated approach to wildlife management and its potential impact on public, animal and environmental health;
- present a range of tools and approaches to better understand, study and understand issues related to wildlife health and their impact;
- demonstrate the links between environmental and socio-economic changes and the emergence of infectious diseases.



# Audience

This training is open to human and animal health professionals, natural resource managers and agronomists involved in training, research or supervision in the fields of rural development, natural resource management and the exploitation of wildlife in southern countries.



## Program

- Presentation of different management systems and optimizing wildlife in southern countries
- Presentations of the concepts of integrated approaches to health (One Health, EcoHealth, Global Health...) in connection with transitions of agricultural systems and ecosystem services
- Case study of wildlife diseases with importance for animal and human health (Ebola, foot-and-mouth disease, HIV, African swine fever, Nipah virus...)
- Human-wildlife conflicts and their socio-economic and environmental impact
- Qualitative tools and methods for the design and implementation of socio-ecosystem approaches (societal, health and environmental interactions)
- Tools and approaches applied to the epidemiological study of wildlife (surveillance, risk analysis, field data collection, molecular tools)
- Introduction to ecological tools for studying wildlife and the ecology of transmission (telemetry, camera traps, drones, molecular biology...)



## Partnerships

This training is organized in close collaboration with OIE (WAHIS network-Working Group on Wildlife), ONCFS (Wildlife surveillance - SAGIR network), IRD MIVEGEC, GREC, CNRS and ENVY.

## Cost

- Training cost : €1,300
- Travel to Montpellier : to be determined by the participant
- Housing expenses : allow a minimum of €90/day

If needed, and especially when several training modules are involved, a customized estimate can be established upon request.

## Field visits

## Important

CIRAD cannot provide study grants. If you wish to request a grant, submit an application as soon as possible to national authorities in charge of livestock and/or scholarships; Cooperation and Cultural Action Services (SCAC) of your local French Embassy; the embassies of other countries; international organizations (FAO, UNDP, EU, IAEA, IDB ...); development projects or NGOs.

## Applications

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[formation-emvt-fvi@cirad.fr](mailto:formation-emvt-fvi@cirad.fr).



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# Qualitative Risk Mapping Analysis Optimization of monitoring systems on transboundary diseases

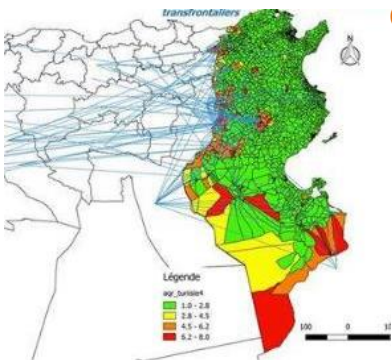
(Delivered in English)

Scientific coordinators

C. Coste & C. Squarzoni-Diaw  
(Cirad UMR ASTRE)

1 to 2 weeks in France, Montpellier

1-5 and 8-12 April, 2019



In order to optimize risk-based surveillance of animal diseases, a method developed by CIRAD integrates a risk mapping approach linked to animal mobility and risk assessment.

The principal objective of this training program is to reinforce national capacities and to assist the vet services or animal health actors of specific countries to prevent the introduction and the spread of diseases in the field and to detect new outbreaks with risk-based surveillance systems. This method can be applied to zoonotic diseases and used by public health experts. The aims of these training program are in particular to acquire gradually tools and methods to manipulate animal flows information and identify the risks associated with them. The training will deal with data collection, processing of technical and statistical analysis, handling geospatial information and cartographic visualization and finally risk assessment, risk mapping and risk-based surveillance.

Veterinaries and animal health workers learn different tools for handling animal flows information and methods to estimate the highest risk factors (movements, periods, regions...). Finally, they are able to produce risk maps for targeted diseases such as Highly Pathogen avian Influenza, Rift Valley Fever, Foot-and-mouth disease, Peste des petits ruminants.

**The 1st session** (5 days) will cover data collection (protocols design and data collection on tablet), processing of technical and statistical analysis (specifically on animal mobility), handling geospatial information and cartographic visualization (GIS tools).

**The 2nd session** (5 days) will be devoted to an introduction to risk mapping, risk assessment and risk-based surveillance methods.

## Educational objectives

At the end of the 1st training week, participants will be able to:

- Master all basic functions of QGIS software for handling geospatial information and creating maps;
- Collect, visualize and analyze animal (or human) movements

At the end of the 2nd training week, participants will be able to:

- Assess risk of a disease, analyze and map it (risk assessment)
- Finally design risk based surveillance protocols according to a specific country context and national monitoring system.

# Admission



To attend the course, the candidate must

**Week 1** : Hold a diploma in veterinary medicine or public health, or hold a degree in agronomy, a master's degree compatible with the subject of the course, a diploma in agricultural or medicine work engineering, or equivalent. This course may be taken by candidates not belonging to these categories, but justifying sufficient professional experience.

Candidates must be proficient in English and have basic computer skills (knowledge of the Windows environment) as well as in the basic QGIS functions (recommended)

**Week 2** : be present during the 1<sup>st</sup> week or know the basic use of QGIS and SNA (Social Network Analysis).

## Material provided

- PowerPoint presentations, computers. All softwares are free and will be pre-installed.
- It is essential for the second week, that the participants bring their own datasets on the animals movements (national or/and transboundary) and possibly any information such as the list of municipalities, water points, markets and epidemiological data (outbreaks, vaccination coverage linked to a priority disease).

If participants can't provide their own information on animal movements, examples of other countries will be taken.

## Training costs

- Training costs : 1 500 € per week or 2 800 € for 2 weeks
- Travel towards Montpellier : not included, to be covered by participants
- Housing expenses : not included, plan a minimum of 80 € a day

If necessary, a customized quote can be established upon request.

## Important

CIRAD cannot provide study grants. If you wish to request a grant, submit an application as soon as possible to national authorities in charge of livestock and/or scholarships; Cooperation and Cultural Action Services (SCAC) of your local French Embassy; the embassies of other countries; international organizations (FAO, UNDP, EU, IAEA, IDB ...); development projects or NGOs.

## Application procedure

Applications, consisting of a detailed resume, a motivation letter and details about the organization managing your grant, must be sent as far as possible before **March 1st, 2019**

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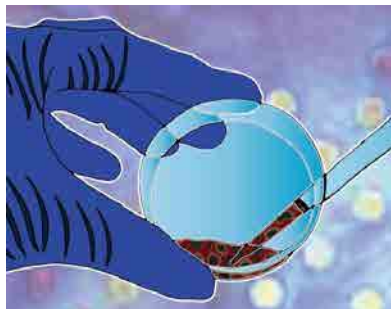
## Program

### Week 1: Tools initiation

- Concepts QGIS (Introduction and overview of QGIS functions)
- Data collection (protocols design and data collection on tablet)
- Handling animal movements information (Social Network Analysis (SNA))

### Week 2: Risk mapping and surveillance protocols

- Qualitative risk analysis (Release, exposure and hazard occurring assessments and mapping)
- Risk-based protocols (design surveillance systems according to a specific country context and national monitoring system)



# Principles of animal cell culture workshop

(Delivered in English or in French)

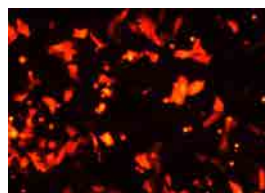
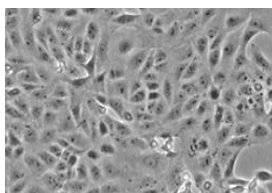
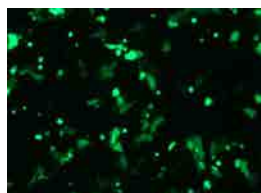
Scientific coordinators

I.CHANTAL - C.MINET  
(Cirad/IRD UMR INTERTRYP)



2 weeks  
between October and April  
(dates to be determined based on demand)

Cell culture is a set of biological techniques used to grow cells outside their organism (ex vivo) or their natural environment. This tool is increasingly required to validate protocols prior to conducting animal experiments.



## Course objectives

The main objective of this workshop is to acquire the theoretical and practical principles of animal cell culture.

## Organisation of the Workshop

- The workshop can be held at Cirad in Montpellier (France) (Baillarguet International Campus). Number of participants: maximum 4 to 6.
- It may also take the form of an itinerant training course by invitation: Payment of travel expenses, accommodation and expertise of the trainer(s) by the host organization with the provision of a laboratory equipped with at least one PSM and a CO2 incubator for the practical part of the workshop.
- A multiple choice quiz at the end of the session serves to assess what has been learned.



## Audience

This workshop is for students, technicians, engineers and anyone wishing to learn the principles and good practices in cell culture that are needed to operate and/or to set up a cell culture laboratory.

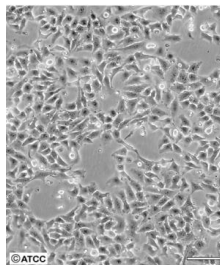
Prerequisites: ideally, knowledge of animal cell structure and laboratory work (use of micropipettes)



## Program

The workshop is spread over two consecutive weeks attended full time. This training program consists of theoretical courses, tutorials and practical work on the following topics:

- introduction to animal cell culture,
- understanding of animal cell culture conditions,
- conservation of animal cells,
- transformation of animal cells,
- acquisition of correct cell culture laboratory practices.



## Cost

- Training at Cirad in Montpellier (France) : €2,500
- Itinerant training by invitation : contact us
- Housing expenses : allow a minimum of €90/day

If necessary, and especially when two or more courses are taken, a customized estimate can be established upon request.

## Important

CIRAD cannot provide study grants. If you wish to request a grant, submit an application as soon as possible to national authorities in charge of livestock and/or scholarships; Cooperation and Cultural Action Services (SCAC) of your local French Embassy; the embassies of other countries; international organizations (FAO, UNDP, EU, IAEA, IDB ...); development projects or NGOs.

## Application procedure

Applications, consisting of a detailed resume, a letter of motivation and details about the organization managing your grant, must be sent to:

[formation-emvt-fvi@cirad.fr](mailto:formation-emvt-fvi@cirad.fr)



See our other trainings : <http://formation-elevage-suds.cirad.fr>

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# Audience

This course is open to veterinarians and zootechnicians, agronomists, doctors, and health professionals responsible for setting up and operating epidemiological surveillance networks. Wildlife professionals and livestock experts are also welcome to participate.

Candidates who do not belong to these categories but who have sufficient professional experience in health surveillance may take the course as well.

All candidates must have a good command of French.



## Program

- Design of an epidemiological surveillance network
- Field actors and agents
- Evaluation of a network
- Training and communication
- Case studies, practical tutorials



This module is part of the SEMHA and GIMAT masters' programmes.

## Cost

- Training cost : €2,500
- Travel to Montpellier : to be determined by the participant
- Housing expenses: : allow a minimum of €90/day

If needed, a customized quote can be established upon request, especially when two or more courses are attended.



## Important

CIRAD cannot provide scholarships. If you wish to request a scholarship, please submit an application as soon as possible to national authorities in charge of livestock and/or scholarships; Cooperation and Cultural Action Services (SCAC) of your local French Embassy; the embassies of other countries; international organizations (FAO, UNDP, EU, IAEA, IDB ...); development projects or NGOs.

## Application procedure

Applications, consisting of a detailed resume, a motivation letter and details about the organization managing your scholarship, must be sent if possible before:

**20 September 2019**

by email: [formation-emvt-fvi@cirad.fr](mailto:formation-emvt-fvi@cirad.fr)



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# Diagnostic techniques for CBPP (and/or CCPP)

(Delivered in French & English)

Scientific coordinator

F. THIAUCOURT  
(Cirad UMR ASTRE)



1 week

date to determine depending on the request

Contagious bovine pleuropneumonia (CBPP) is on the list drawn up by the Office International des Epizooties (OIE) of diseases with a major impact on livestock or representing a major constraint to international trade. CBPP is caused by a mycoplasma, *Mycoplasma mycoides* subsp. *mycoides* SC.

This disease is characterized by respiratory symptoms and pleurisy and pneumonia lesions. These lesions can progress to a chronic stage and animals bearing them, while hardly detectable by clinical observation, are a source of reinfection for healthy herds.

Until recently, the fight against CBPP relied on mass vaccination campaigns, often associated with ones directed against rinderpest. These campaigns are costly due to the need for annual vaccination boosters. As a result, the vaccination effort is difficult to maintain in Africa and the number of outbreaks is increasing.

The use of laboratory diagnosis is essential, both to confirm the suspicion of CBPP, but also to measure the impact of the disease on livestock and thus to be able to develop appropriate control strategies. The laboratory diagnosis presents no major technical difficulties but it requires real practical experience in order to be performed correctly. The same is true for Contagious caprine pleuropneumonia (CCPP).

## Training objectives

This technical training course can be developed for CBPP and/or CCPP.

At the end of the training, participants will be able to:

- perform serological analyses of CBPP (CCPP) by eLISA technique (IDEXX), learn the basics of quality control in this field and know how to interpret the results;
- isolate and identify the agent of CBPP (CCPP) by conventional techniques (biochemical tests, growth inhibition) and analyze the difficulties encountered in the field;
- perform the titration of a vaccine against CBPP (PPCC);
- describe the principles of the PCR technique applied to CBPP (PPCC) for rapid diagnosis.

Modular training

## Audience

This course is open to persons directly involved in the diagnosis of CBPP / CCPP (veterinarians, laboratory technicians).

Candidates must have a good command of French.

Upon request, English sessions or sessions relocated within partner institutions can be organized if a sufficient number of participants are present (at least 5).

The date and duration of the training can also be adapted as needed.



## Program



The programme alternates between theory and practice to enable participants to become familiar with serological and bacteriological techniques

- |            |          |
|------------|----------|
| ▪ Theory   | 15 hours |
| ▪ Practice | 15 hours |

## Cost

- Training cost : €1,300
- Travel to Montpellier : to be determined by the participant
- Housing expenses : allow a minimum of €90/day

If needed, and especially when several successive training modules are involved, a customized estimate can be established upon request.



## Important

CIRAD cannot provide study grants. If you wish to request a grant, submit an application as soon as possible to national authorities in charge of livestock and/or scholarships; Cooperation and Cultural Action Services (SCAC) of your local French Embassy; the embassies of other countries; international organizations (FAO, UNDP, EU, IAEA, IDB ...); development projects or NGOs.

## Applications

Applications, consisting of a detailed resume, a motivation letter and details about the organization managing your grant, must be sent by email to [formation-emvt-fvi@cirad.fr](mailto:formation-emvt-fvi@cirad.fr).



See our other trainings : <http://formation-elevage-suds.cirad.fr>

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# Diagnostic techniques for Peste des petits ruminants

(Delivered in English)

Scientific coordinator

A.BATAILLE - G. LIBEAU  
(Cirad UMR ASTRE)

4 days

18 to 21 november 2019



Peste des petits ruminants (PPR) is a highly infectious viral disease of small wild and domestic ruminants. In livestock farming areas where the disease is enzootic, it causes significant economic losses due to high morbidity and mortality rates. PPR affects nearly one billion small ruminants around the world.

The causative agent is PPRV, which belongs to the *Morbillivirus* genus, *Paramyxoviridae* family. Serological diagnosis is conventionally undertaken using competitive ELISA (cELISA). As virus isolation is difficult to achieve in less than three weeks, other methods, including gene amplification, are used to rapidly identify the virus directly from field samples. These methods, which are very sensitive and specific, are conventional reverse transcription-PCR (RT-PCR) and real time RT-PCR (rRT-PCR). Conventional RT-PCR provides a template for sequencing and subsequent phylogenetic analysis while rRT-PCR is used to quantify viral loads.

## Course objectives

The course focuses on teaching the different methods classically implemented for serological and molecular diagnosis of PPR. This training programme presents standardized protocols and procedures as well as the instructions for using the necessary equipment.

The specific objectives are to provide:

- training in serological diagnosis of PPRV
- knowledge about OIE reference protocols for serology (i.e., virus neutralisation and cELISA)
- training in molecular diagnosis of PPRV
- knowledge about different RT and rRT-PCR procedures
- information about molecular sequencing and phylogenetic analysis of PPRV

At the end of the training, participants should be able to establish a diagnosis in their own laboratory, reproduce the methods learned, and train and support laboratory staff.



Modular training

## Audience

Participants must be actively involved in the diagnosis of animal diseases and have experience in molecular biology techniques. Basic theoretical knowledge in PCR is required. Candidates should have good working knowledge in French or English. The number of participants is strictly limited to six. Upon request, sessions can be relocated within partner institutions if a sufficient number of participants are present and the schedule of the reference laboratory allows it.



## Program

- The programme alternates between theoretical presentations and practical training (serology, virus titration, conventional and real time PCRs).

## Cost

- Training course : €1,600
- Travel to Montpellier : to be determined by the participant
- Housing expenses : allow a minimum of about €90/day

If needed, a customized estimate can be established upon request, especially when two or more courses are involved.



## Important

CIRAD cannot provide study grants. If you wish to request a grant, submit an application as soon as possible to national authorities in charge of livestock and/or scholarships; Cooperation and Cultural Action Services (SCAC) of your local French Embassy; the embassies of other countries; international organizations (FAO, UNDP, EU, IAEA, IDB ...); development projects or NGOs.

## Modalités de candidature

Applications, consisting of a detailed resume, a motivation letter and details about the organization managing your grant, must be sent if possible before:

**30 June 2019**

by email: [formation-emvt-fvi@cirad.fr](mailto:formation-emvt-fvi@cirad.fr)



See our other trainings : <http://formation-elevage-suds.cirad.fr>

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# Diagnosis PPR course: PRACTICE ASSESSMENT FORM



1 - Do you have any technical experience in Molecular Biology?

- ☐ YES
- ☐ NO

If yes, length of experience, specifying the year:

.....

2 - What kind of equipment do you usually use?

- ☐ Brand and type of machine .....
- ☐ None

3 - Do you routinely perform molecular diagnosis?

- ☐ YES
- ☐ NO

If yes:

- ☐ On which diseases? .....
- ☐ Which gene(s) do you amplify? .....

4 - State one main drawback and one advantage of conventional PCR?

- ☐ Drawback: .....
- ☐ Advantage : .....

5 - Paul received in his laboratory 4 samples with a suspicion of *Mycoplasma pneumoniae*. He prepared a PCR mix and the PCR reaction according to the following table:

<u>MIX PCR pour 1 réaction</u>		<u>Conditions de la réaction de PCR</u>		
Tampon PCR 10X	5 $\mu$ l	94°C	2 min	1 cycle
Mix dNTP contenant 10mM de chaque dNTP:	0,5 $\mu$ l	94°C	30 sec	30 cycles
primer spécifique sens 20 $\mu$ M	1 $\mu$ l	55°C	30 sec	
primer spécifique reverse 20 $\mu$ M	1 $\mu$ l	72°C	30 sec	
Enzyme Taq DNA polymérase	0,5 $\mu$ l			
		72°C	7 min	
ADN	2 $\mu$ l	4°C	over night	
H2O	40 $\mu$ l			

After migration of 10 $\mu$ l of the PCR reactions, all results were negative including the positive control. If you were Paul, what would be your first hypothesis to explain this unexpected result?

.....

.....

.....

.....

.....







# One Health and Integrated Health Approaches

Scientific coordinator  
(Delivered in French)

J . CAPPELLE  
(Cirad UMR ASTRE )

2 weeks

12 – 22 November 2019



This training module provides an introduction to One Health and EcoHealth approaches. The multidisciplinary features of these two approaches are examined to enable participants to consider the complexity of socio-ecological systems and their impact on the health of both animals and humans. Different disciplines (ecology, geography, anthropology, sociology...) that can contribute to a better understanding of health issues are presented through practical examples highlighting the methods and indicators used in One Health and other integrated approaches, alongside their advantages and disadvantages. Participatory and qualitative investigative methods are examined in particular, as well as methods which allow the integration of different disciplines.

## Course objectives

By the end of the training, participants will have a better understanding of One Health and integrated Health approaches. They should be able to:

- understand the key theories, concepts and models in One Health and integrated Health approaches;
- understand the fundamental principles of eco-epidemiology, wildlife ecology and host-parasite interactions in relation to health;
- understand the correlations between biodiversity and health;
- know the methods and techniques used in the management of wildlife and animal and zoonotic diseases at the interface of domestic animals;
- identify and manage the social and behavioural factors affecting human and animal health (surveillance and control);
- understand the principles and areas of application of health geography: social science of space;
- collect and analyze qualitative data;
- understand open and semi-structured interview techniques;
- understand the principles of participatory epidemiology;
- analyse qualitative data using content analysis.

# Audience

Due to the multidisciplinary nature of One Health and EcoHealth approaches, this course is open to anyone concerned by or interested in animal and human health management issues (doctors, veterinarians, epidemiologists, but also ecologists, sociologists, anthropologists, geographers, modelers, etc.). Candidates may work in different sectors (government ministries, research organizations, industry, NGOs...).

All candidates must have a good command of French.



## Program (indicative)



This module is part of the  
GIMAT master's programme.

- Presentation of One Health and EcoHealth approaches
- Introduction to ecology, geography, sociology and anthropology related to health
- Presentation of participatory, qualitative and integrative methods
- Practical tutorials

**Field trip, wildlife monitoring methods in ecology and epidemiology**

## Cost

- Training cost : €2,000
- Travel to Montpellier : to be determined by the participant
- Housing expenses : allow a minimum of about €90/day

If necessary, a customized estimate can be established upon request, especially when two or more courses are attended.



## Important

CIRAD cannot provide study grants. If you wish to request a grant, submit an application as soon as possible to national authorities in charge of livestock and/or scholarships; Cooperation and Cultural Action Services (SCAC) of your local French Embassy; the embassies of other countries; international organizations (FAO, UNDP, EU, IAEA, IDB ...); development projects or NGOs.

## Application procedure

Applications, consisting of a detailed resume, a motivation letter and details about the organization managing your grant, must be sent if possible before

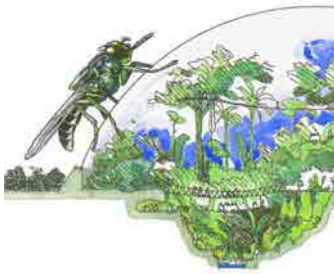
**11 October 2019**

by email: [formation-emvt-fvi@cirad.fr](mailto:formation-emvt-fvi@cirad.fr).



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# Ecology and Integrated Vector Control

(Delivered in French)



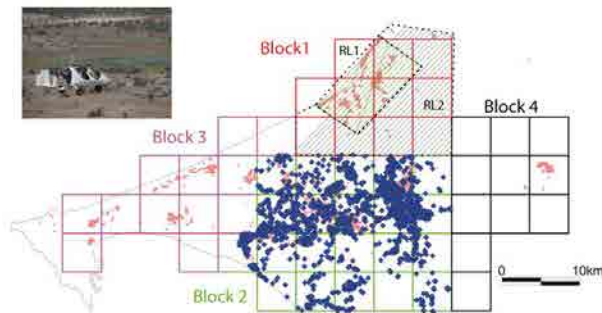
Scientific coordinators

T. BALDET – S. RAVEL - F. STACHURSKI – S. THEVENON  
(Cirad/IRD UMRs ASTRE & INTERTRYP)

1 week  
9-13 December 2019

The development of strategies and methods for the control of human and animal vector-borne diseases is an important part of the work of researchers at CIRAD Research Units [ASTRE](#) and [Intertryp](#).

This module aims to describe integrated, innovative and environmentally friendly approaches to vector control implemented at different scales (livestock farm, village and region, including Area-wide Integrated Pest Management) by presenting the main methods of vector control (chemical, physical, biological, genetic). The groups of arthropod vectors featured (tsetse flies, ticks, *Culicoides*, mosquitoes, mechanical vectors) are the most important in terms of public and veterinary health, especially in the tropics. Participants will learn that integrated control is based on a thorough understanding of the biology and ecology, including behavioral, of the targeted arthropod populations.



## Course objectives

By the end of the course, participants will be able to:

- study the targeted vector populations to select the most appropriate control strategies;
- be familiar with the main vector control methods for each vector group targeted;
- understand the strategic choices made by vector control operators between elimination and control;
- understand how different control methods interact and can be combined;
- anticipate the environmental impacts and the societal, economic and ethical dimensions of vector control campaigns.

# Audience

This course is open to veterinarians, agronomists and engineers working in the field of animal husbandry, animal health or wildlife management in the tropics who wish to strengthen their skills. Candidates who do not belong to these categories but who have sufficient professional experience are welcome to join the course.

All candidates must have a good command of French.



This module is part of the GIMAT master programme.

## Program

### Partnerships

With the participation of IRD's UMR MIVEGEC.

This training program is possible thanks to the unique complementarity of the disciplines present in the Research Units involved. It is based on activities conducted in continuous interaction between researchers working in the North and South, with some conducted entirely by Southern partners.



### Cost

- Training cost : €1,300
- Travel to Montpellier : to be determined by the participant
- Housing expenses : allow a minimum of about €90/day

If necessary, a customized estimate can be established upon request, especially when two or more courses are attended.

- Investigative methods in vector ecology
- Ecology and behaviour of ticks, mosquitoes, Culicoides and tsetse flies
- Integrated control of heartwater & principles of enzootic stability
- Integrated control of African animal trypanosomosis
- Conventional vector control
- Resistance to acaricides in ticks
- Resistance to insecticides in mosquitoes
- AW-IPM: Area-wide Integrated Pest Management
- Mechanical tsetse flies control
- Alternative tick control methods
- Sterile Insect Technique (SIT)
- Genetic vector control
- Biological control of Biting flies
- Use of trypanotolerant breeds

**Practical exercises and visit to CIRAD's insectarium in Baillarguet**

### Important

CIRAD cannot provide study grants. If you wish to request a grant, submit an application as soon as possible to national authorities in charge of livestock and/or scholarships; Cooperation and Cultural Action Services (SCAC) of your local French Embassy; the embassies of other countries; international organizations (FAO, UNDP, EU, IAEA, IDB ...); development projects or NGOs.

### Application procedure

Applications, consisting of a detailed resume, a motivation letter and details about the organization managing your grant, must be sent if possible before:

**8 November 2019**

by email: [formation-emvt-fvi@cirad.fr](mailto:formation-emvt-fvi@cirad.fr)

See our other trainings : <http://formation-elevage-suds.cirad.fr>



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# Outbreak intervention

(Delivered in French)



## Scientific coordinators

C. SQUARZONI-DIAW (Cirad UMR ASTRE)

A. WARET SZKUTA (ENVT)

1 week

16-20 December 2019

Given the current spread of pathogens and health risks, countries need to strengthen their disease surveillance and early-warning capabilities in the field.

The work of field epidemiologists is vast and serves to provide rapid and concrete responses to health problems at the population level in order to inform animal health decisions. The practice of epidemiology still applies to other areas. Intervention epidemiology, or field epidemiology, is closely related to other disciplines (health economics, statistics applied to epidemiology, risk assessment, disease surveillance, environmental risk, health policies, social sciences...).

Intervention epidemiology brings together several specific activities, including epidemiological investigation, assessment of the situation and risks, data processing...

This module provides students and professionals with a review of the key principles of field epidemiology. Scenarios, knowledge of intervention methods and innovative tools in applied epidemiology, an on-site scenario and a virtual case study are important components of this module.



## Course objectives

The "Intervention Epidemiology" module aims to equip participants with the capacity to apply modern epidemiological approaches to control an epidemic in a population, understand a crisis situation and assess the risks, detect and investigate outbreaks and assess the impact of control measures on health problems.

Through case studies, theoretical & practical concepts and scripted exercises, participants will learn to apply the principles and methods of intervention epidemiology and to use innovative methods for the analysis of relevant data.

At the end of the course, participants will be able to:

- understand the main principles of field epidemiology;
- understand the key concepts to coordinate an epidemiological investigation;
- construct a survey questionnaire and conduct a systematic collection of data.
- implement a methodical approach to outbreak investigation;
- understand the main actions to be implemented on site in order to support health decisions;



# Audience

This course is open to holders of a Diploma of Fundamental Veterinary Studies awarded by a French National Veterinary School (or a recognized equivalent diploma/agronomist, engineer, university with a first year master's level...) or any health professional (public or veterinary) responsible for field investigation. Foreign diplomas must be recognized as being equivalent to a first year master's degree in the French education system (M1). Applicants must also have a good command of French.



This module is part of the GIMAT Master's programme.

## Program

### Partnerships

With the participation of the National Veterinary school of Toulouse (ENVT).

This training programme is possible thanks to the unique complementarity of the disciplines present in the institutions involved. It is based on activities conducted through continuous interaction between researchers working in the North and South.

### Cost

- Training course : €1,300
- Travel to Montpellier : to be determined by the participant
- Housing expenses : allow a minimum of about €90/day

If necessary, a customized estimate can be established upon request, especially when two or more courses are attended.

- Main principles of field epidemiology
- Design a questionnaire & online questionnaire
- Warning signals
- Outbreak investigation procedure
- Case studies of applied epidemiology
- Field survey preparation (methodology, questionnaire, logistics)
- Modern investigative methods & use of digital tools
- Analysis of data collected
- Feedback from the field

**Field simulation (digital case study and pedagogical movie)**

### Important

CIRAD cannot provide study grants. If you wish to request a grant, submit an application as soon as possible to national authorities in charge of livestock and/or scholarships; Cooperation and Cultural Action Services (SCAC) of your local French Embassy; the embassies of other countries; international organizations (FAO, UNDP, EU, IAEA, IDB ...); development projects or NGOs.

### Application procedure

Applications, consisting of a detailed resume, a motivation letter and details about the organization managing your grant, must be sent if possible before:

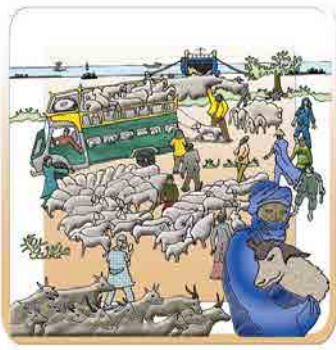
**15 November 2019**

by email: [formation-emvt-fvi@cirad.fr](mailto:formation-emvt-fvi@cirad.fr)



See our other trainings : <http://formation-elevage-suds.cirad.fr>

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# Animal mobility



## Scientific coordinators

C. Coste, V. Grosbois, I. Touré,  
H. Valls-Fox & D. Chavernac  
Cirad UMRs ASTRE et SELMET

1 week  
June or October 2019

Collecting information on animal movements has become vital to research and development efforts in the fields of animal health, livestock farming systems and forestry, especially when dedicated databases are lacking. The first challenge is to find data that are relevant and suitable for the scientific or technical issue in question, particularly in countries of the south, where such information is often absent or incomplete.

We will describe different possible sources of information, leading up to the definition of survey protocols (sampling, digital questionnaire with KoBoToolbox...). Through concrete cases, participants then will familiarize themselves with different tools and methods to process information on animal flows (mapping, descriptive statistics, social network analysis...) to better understand this dynamic. These tools are very specific to this type of data.

## Course objectives

While all of the training facilitators are animal movement experts, they also have expertise in a wide range of specialized fields, from livestock systems, information technology, statistics, and mapping to demographics.

By the end of the week of training, the theoretical and practical exercises will have equipped participants with the capacity to handle animal flows and understand their dynamics (actors, seasons, scales...). More specifically, participants will be able to:

- Collect, visualize and analyse animal (and human) movements;
- Use the basic functions of QGIS software to process and map geographic data.

## Program

- Introduction to livestock farming systems and animal mobility
- Data Collection
  - Different types of collection
  - Design of protocols (counting, surveys...)
  - Design of questionnaires on tablets
- Processing information on animal movements
  - Formatting, cleaning up data
  - Mapping flows and overview of functions specific to flows
  - Descriptive analysis (variation...), social network analysis (SNA), analysis of trajectories and drivers of mobility

# Audience

This training program is intended for veterinarians and other actors and students in the fields of health, forestry, agro-economics, agro-environment...

It is recommended that candidates have basic computer skills (knowledge of Windows) and familiarity with GIS.



## Equipment available

- Power point presentations
- Data sets
- All of the software programs used are free and have already been installed on the computers.

## Cost

- Training cost : €1,300
- Travel to Montpellier : to be determined by the participant
- Housing expenses : allow a minimum of about €90/day

If necessary, a customized estimate can be established upon request, especially when two or more courses are attended.



## Important

CIRAD cannot provide study grants. If you wish to request a grant, submit an application as soon as possible to national authorities in charge of livestock and/or scholarships; Cooperation and Cultural Action Services (SCAC) of your local French Embassy; the embassies of other countries; international organizations (FAO, UNDP, EU, IAEA, IDB ...); development projects or NGOs.

## Application procedure

Applications, consisting of a detailed resume, a motivation letter and details about the organization managing your grant, must be sent by email before 1st May 2019 at:

[formation-emvt-fvi@cirad.fr](mailto:formation-emvt-fvi@cirad.fr)



See our other trainings :

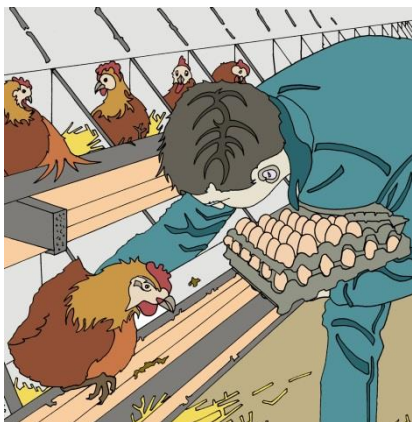
<http://formation-elevage-suds.cirad.fr>

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CIRAD-FVI – Capacity Building Platform for Livestock Management and Animal Health in the Global South

[formation-emvt-fvi@cirad.fr](mailto:formation-emvt-fvi@cirad.fr)





# Livestock systems in the world: Dynamics and Analysis Tools

(Delivered in French)

Scientific coordinators

C-H MOULIN, C Aubron

(Montpellier SupAgro, Cirad UMR SELMET)

**4 weeks**

**18 September - 14 October 2019**

Animal husbandry plays a number of roles, enabling the production of market goods (milk, meat, eggs...), fulfilling social functions (combating poverty and enhancing food security), and contributing to the preservation of landscapes and biodiversity. It thus can contribute to the sustainable development of territories.

In different contexts, animal husbandry can vary greatly in terms of form and organization. It is also subject to varying change dynamics in response to constraints (changes in climate or land use) and opportunities (development of markets for animal products). This diversity and these dynamics are the results of decisions made by livestock farmers, who generally organize their activities within family production units in interaction with other sector and territorial actors.

Given this complexity, the factors behind the diversity of livestock production and the drivers of ongoing change need to be understood. The capacity of livestock farms to continue operating in a changing and uncertain environment and to contribute to sustainable development also must be assessed. Strategies and policies intended to support livestock farmers must be based on this understanding and assessment.

Systemic analysis is a powerful tool for understanding and evaluating complex situations. It makes it possible to distinguish different levels of spatial and temporal organization of agricultural activities: agrarian system, production system, farming systems.

## Course objectives

The overall goal of this module is to train participants in the systemic analysis of livestock farming. By the end of the training, participants will be able to:

- understand the key features of the evolution of global agrarian systems and the role of livestock farming in these systems (from the Neolithic revolution to the present day);
- understand the different factors behind these historical developments;
- understand the role of the socioeconomic environment, markets, and livestock policies on current dynamics;
- understand the concepts, approaches and methods for analyzing livestock systems based on a comprehensive approach to livestock farmers' practices;
- carry out a comprehensive analysis and diagnosis of a livestock production unit.

# Audience

This course is open to agronomists and veterinarians involved in training, research or supervision in the field of animal production.

Candidates who do not belong to these categories but who have sufficient professional experience also may join the course. All candidates must have a good command of French.



This module is part of the “Livestock Farming Systems” specialization of Montpellier SupAgro’s Master 3A program.

## Program (indicative)

## Partnerships



This module is taught by Montpellier SupAgro animal science teachers based on work carried out in collaboration with INRA and CIRAD colleagues from the SELMET Joint Research Unit. Professionals from technical institutes (Institut de l'Élevage, ITAVI, etc.) and from FranceAgriMer also collaborate to the training.

## Cost

- Training cost : €2,000
- Travel to Montpellier : to be determined by the participant
- Housing expenses : allow a minimum of about €90/day

If necessary, a customized estimate can be established upon request, especially when two or more courses are attended.

## Important

CIRAD cannot provide study grants. If you wish to request a grant, submit an application as soon as possible to national authorities in charge of livestock and/or scholarships; Cooperation and Cultural Action Services (SCAC) of your local French Embassy; the embassies of other countries; international organizations (FAO, UNDP, EU, IAEA, IDB ...); development projects or NGOs.

## Application procedure

Applications, consisting of a detailed resume, a motivation letter and details about the organization managing your grant, must be sent if possible before:

**2 August 2019**

by email: [formation-emvt-fvi@cirad.fr](mailto:formation-emvt-fvi@cirad.fr)



See our other trainings : <http://formation-elevage-suds.cirad.fr>

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# Pastoralisms

(Delivered in French)



Scientific coordinators

M. JOUVEN - J. HUGUENIN - C-H. MOULIN  
(SupAgro/Cirad, UMR SELMET)

**3 consecutive weeks**  
**17 October – 7 November 2019**

Pastoral systems are based on a close association between humans, domestic ruminants and natural resources. In many countries around the world, they have historically contributed to meeting the food, economic and cultural needs of the local populations. Recent developments in societies (monetization, globalization, productivism, land pressure...) and environments (drought, climate change, desertification...) have called into question the sustainability and value of these livelihood and production systems.

However, new global challenges involving sustainable development, poverty alleviation, ecosystem preservation, dryland development and ecological intensification of agriculture have refocused attention on these systems in order to identify new development pathways and new modes of agricultural production around the Mediterranean basin and in tropical regions.

This course offers a multidisciplinary approach to the functioning of pastoral systems and their current and potential role in sustainable development, and provides a framework and tools to assess their relevance and potential in different development contexts.

## Course objectives

This module places pastoralism within a broader context, examining it from the scale of the herd up to the territory. Special attention is devoted to interactions between pastoral systems and their physical (grazed vegetation, water resources...) and socio-economic environments (pastoral societies, value chains, territories).

At the end of the course, participants will be able to:

- describe the different forms of organization of animal production in pastoral societies and processes of change leading towards agro-pastoral livestock production;
- understand the biological basis of pastoralism and deduce methodological principles to analyse the use of plant resources by flocks and herds;
- describe the main principles of the social management of resources (land, water) in pastoral societies (resource sharing, reciprocity, mobility, crisis management...);
- Present tools, policy and institutional actions to support stakeholders in negotiations on resource management at different scales (from local to international).

Modular training



# Audience

This course is open to agronomists and veterinarians involved in training, research or supervision in the field of animal production or natural resource management who wish to take into account the dimension of animal husbandry on rangelands (pastoral or agropastoral) in the planning and implementation of their activities.

Candidates who do not belong to these categories but who have sufficient professional experience are also welcome to join the course.

All candidates must have a good command of French.



This module is part of the “Livestock Farming Systems” specialization of Montpellier SupAgro’s Master 3A program.



## Partnership



This module is taught by Montpellier SupAgro animal science teachers based on work carried out in collaboration with INRA and CIRAD colleagues from the SELMET Joint Research Unit. Professionals from technical institutes (Institut de l'Elevage, ITAVI, etc.) and from FranceAgriMer also collaborate to the training.

## Cost

- Training cost : €1,300
- Travel to Montpellier : to be determined by the participant
- Housing expenses : allow a minimum of about €90/day

If necessary, a customized estimate can be established upon request, especially when two or more courses are attended.

## Important

CIRAD cannot provide study grants. If you wish to request a grant, submit an application as soon as possible to national authorities in charge of livestock and/or scholarships; Cooperation and Cultural Action Services (SCAC) of your local French Embassy; the embassies of other countries; international organizations (FAO, UNDP, EU, IAEA, IDB ...); development projects or NGOs.

## Application procedure

Applications, consisting of a detailed resume, a motivation letter and details about the organization managing your grant, must be sent by email to:

[formation-emvt-fvi@cirad.fr](mailto:formation-emvt-fvi@cirad.fr)



See our other trainings : <http://formation-elevage-suds.cirad.fr>

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The organization of training courses in this field is part of its mandate.*

**CIRAD-FVI – Capacity Building Platform for Livestock Management and Animal Health in the Global South**  
[formation-emvt-fvi@cirad.fr](http://formation-emvt-fvi@cirad.fr)



The module is organized around three main topics, with 2 to 3 days in the field:

- Diversity of pastoralism: forms, challenges, research questions and development
- The biophysical bases of pastoralism: herds, flocks, vegetation and pastures
- Access to grazing resources: social management of resources, analysis and action tools



"Crédit photo CIRAD"



# Interactive R: building web applications with Shiny

(Delivered in French)

S. Falala (Cirad/INRA UMR ASTRE)

G. Cornu (Cirad UR F&S)



**2 days**  
**26 to 28 June 2019**

Sharing your research results via the internet and in an interactive way has become easy with tools like R Shiny (<http://shiny.rstudio.com/>) , allowing you to quickly build web applications and avoid more complex programming in other languages.

Interactive displays of graphs, tables, maps... can easily be developed with Shiny and its dedicated libraries.

Shiny thus makes it possible to create engaging and attractive interfaces which are excellent communication tools.

## Course objectives

By the end of the training course, participants will be able to build a web application with R Shiny. More specifically, they will know how to:

- structure the application by distinguishing the different files and basic files;
- create the interface by programming with dedicated functions;
- manage interactions to modify the display according to the input parameters;
- enrich the application by fine-tuning interactions and developing sophisticated interfaces;
- upload the application online.

## Audience

This course is intended for anyone (student, researcher, engineer, technician ...) who needs to set up an interactive representation of data processed with R.

Basic knowledge of R software is required.

Knowledge about programming with functions is desirable.

The course is limited to a maximum of 12 participants.

Modular training

# Program



## Structure the application

- The different code files for the interface, interactions and global variables
- The files depending on the content (data, images, external code...)

## Create the interface

- Outputs/displays: tables, images, graphs, texts...
- Inputs/controls: buttons, checkboxes, drop-down lists...

## Manage the interaction

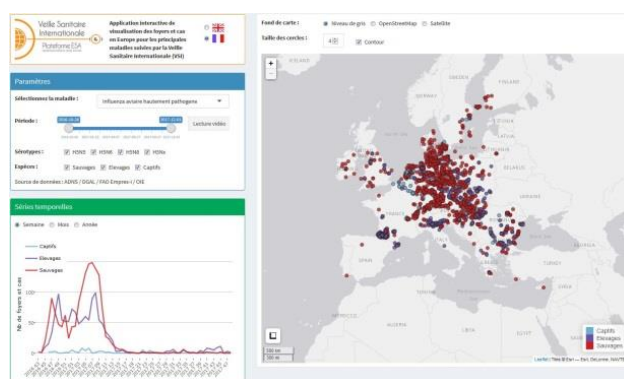
- Rendering functions and link with display functions
- Reactive programming: inputs in rendering functions, observers

## Enrich the application

- Interaction: variables and reactive expressions, isolation, timer
- Interface: layouts, panels, shinyjs and shinydashboard packages
- Interactive maps with the Leaflet package, interactive graphs with the Plotly package

## Upload the application

- Presentation of shinyapps.io
- Information for setting up a Shiny server



If necessary, a customized estimate can be established upon request, especially when two or more courses are attended.

## Cost

- Training course : €800
- Travel to Montpellier : to be determined by the participant
- Housing expenses : allow a minimum of about €90/day

## Important

CIRAD cannot provide study grants. If you wish to request a grant, submit an application as soon as possible to national authorities in charge of livestock and/or scholarships; Cooperation and Cultural Action Services (SCAC) of your local French Embassy; the embassies of other countries; international organizations (FAO, UNDP, EU, IAEA, IDB ...); development projects or NGOs.

## Application procedure

Applications, consisting of a detailed resume, a motivation letter and details about the organization managing your grant, must be sent by email to:

[formation-emvt-fvi@cirad.fr](mailto:formation-emvt-fvi@cirad.fr)



See our other trainings : <http://formation-elevage-suds.cirad.fr>



# From Field Data to Online Maps

(Delivered in French & English)



## Scientific coordinators

D. CHAVERNAC (Cirad UMR ASTRE)  
A. CLOPES (Cirad UMR Tétis)  
C. COSTE (Cirad UMR ASTRE)  
J-B. LAURENT (Cirad UR Aïda)

1 week

16 - 20 December 2019

Internet and mobile technologies have developed extensively in the southern hemisphere, especially in areas in Africa that until only recently had remained remote.

The widespread use of mobile technologies in the field opens up new ways of generating and disseminating knowledge through the:

- acquisition of georeferenced information by multiple users using their smartphones,
- integration of this information into a Geographic Information System (GIS),
- development and distribution via the internet of thematic maps based on the analysis of collected data.

## Course objectives

By the end of the course, participants will be able to:

- create a mobile application for data collection and deploy it in the field;
- integrate mobile data into a GIS;
- develop maps using the data collected;
- deploy these maps on the internet without needing software development;
- share GIS information with colleagues.



Modular training

## Audience

No particular technical knowledge is required to participate in this course, but some familiarity with a GIS program will help you get the most out of the training. Candidates must be comfortable with computers (knowledge of the Windows environment) and basic office software concepts such as file management and Excel. The training course is delivered in French and English.



## Program

The course consists of 3 modules delivered over 5 days:

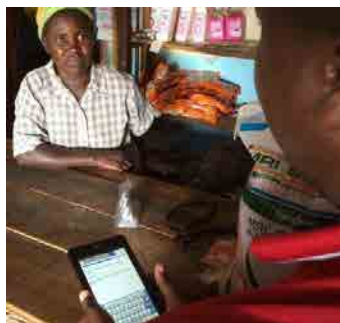
- Creating a mobile data collection application and using it in the field: 1.5 days
- Processing data using QGIS: 2 days
- Publishing data on the internet using Lizmap: 1.5 days



## Cost

- Training cost : €1,800
- Travel to Montpellier : to be determined by the participant
- Housing expenses : allow a minimum of about €90/day

If necessary, a customized estimate can be established upon request, especially when two or more courses are attended.



## Important

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## Application procedure

Applications, consisting of a detailed resume, a motivation letter and details about the organization managing your grant, must be sent **as soon as possible**

by email: [formation-emvt-fvi@cirad.fr](mailto:formation-emvt-fvi@cirad.fr)



See our other trainings : <http://formation-elevage-suds.cirad.fr>





# Data Management applied to Epidemiological Surveillance

(Delivered in French)



## Scientific coordinators

D. CHAVERNAC, X. JUANES  
(Cirad UMRs ASTRE & SELMET)

1 week

25 - 29 November 2019

The establishment of epidemiological surveillance networks generates the collection of large amounts of data. These data need to be managed correctly to extract the health information that can enable animal health officials to make the most relevant intervention decisions. Due to the diversity and complexity of the data collected by surveillance networks, global information systems must be established to achieve three main objectives:

- the regular publication of health situation summaries;
- the calculation of performance indicators;
- the editing of network management settings.

The collection of data in the field, and the management and processing of this data, is thus a priority for those analysing the information collected by an epidemiological surveillance network, as well as for units responsible for health interventions in the field.



## Course objectives

By the end of the course, participants will be able to:

- design a data collection tool in the field;
- design a data base;
- build simple queries;
- create user-friendly and intuitive input interfaces (using Relational Database Management Systems).

Modular training



## Audience

This training is open to veterinarians, agricultural engineers and holders of a Master's degree or equivalent in subjects compatible with the course.  
Candidates who do not belong to these categories but who have sufficient professional experience are also welcome to join the course.  
Candidates must be comfortable with computers (knowledge of the Windows environment) and basic office software concepts: file management, Word, Excel.  
All candidates also must have a good command of French.



This module is part of the SEMHA and GIMAT master's programs.



## Cost

- Training cost : €1,100
- Travel to Montpellier : to be determined by the participant
- Housing expenses : allow a minimum of about €90/day

If necessary, a customized estimate can be established upon request, especially when two or more courses are attended.

## Program

- Design a mobile application for collecting data
- Discover and get started with relational data bases
- Practical exercises



## Important

CIRAD cannot provide study grants. If you wish to request a grant, submit an application as soon as possible to national authorities in charge of livestock and/or scholarships; Cooperation and Cultural Action Services (SCAC) of your local French Embassy; the embassies of other countries; international organizations (FAO, UNDP, EU, IAEA, IDB ...); development projects or NGOs.

## Application procedure

Applications, consisting of a detailed resume, a motivation letter and details about the organization managing your grant, must be sent if possible before:

**25 October 2019**

by email: [formation-emvt-fvi@cirad.fr](mailto:formation-emvt-fvi@cirad.fr)



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# Information Systems applied to Epidemiological Surveillance

(Delivered in French)



Scientific coordinators

D.Chavernac, X.Juanès & J-C SICARD

(Cirad UMRs ASTRE et SELMET)

3 weeks

25 November - 13 December 2019

The establishment of epidemiological surveillance networks generates the collection of large amounts of data. These data need to be managed correctly to extract the health information that can enable animal health officials to make the most relevant intervention decisions. Due to the diversity and complexity of the data collected by surveillance networks, global information systems must be established to achieve three main objectives: the regular publication of health situation summaries, the calculation of performance indicators and the editing of network management settings.

A geographic information system (GIS), as an integral part of a global information system, is a tool that enables the geographic representation and analysis of spatial data.

Based on information gathered from the data collected through the global information system, it can, for example, allow the representation of all outbreaks reported for a disease, as well as their evolution in time and space. It is also easy to clearly visualize the animal population at risk as well as the means of intervention that may be available on the ground. By enabling the creation and the rapid and easy updating of maps representing a health situation highlighted by an epidemiological surveillance network, GIS provides public animal health authorities key elements for relevant and effective decisions.

The collection and processing of epidemiological data has thus become a priority for those in charge of analysing the information collected by an epidemiological surveillance network, as well as for units responsible for public health interventions in the field.

## Course objectives

By the end of the course, participants will be able to design an information system for an epidemiological surveillance network that is intended to manage information from the field up to its presentation. This includes:

- creating models for data management;
- analysing data through simple queries;
- setting up input interfaces (using Access);
- conducting thematic analyses and simple queries to represent and interpret data and produce maps to support decision-making.

Modular training

# Audience

This course is open to veterinarians and zootechnicians responsible for setting up and operating epidemiological surveillance networks. Candidates who do not belong to these categories but who have suitable professional experience are also welcome to join the course. Candidates must have a good command of French and be familiar with the Windows environment. Some experience, even if limited, in the handling and processing of data is a plus.



This module is part of the SEMHA and GIMAT master's programs.

## Program

- **Databases applied to epidemiological surveillance**  
discovering and getting started with Access
- **GIS applied to epidemiological surveillance**  
getting started with Quantum GIS (qGIS), mapping, formatting maps
- **Practical applications**

## Cost

- Training course : €2,500
- Travel to Montpellier : to be determined by the participant
- Housing expenses : allow a minimum of about €90/day

If necessary, a customized estimate can be established upon request, especially when two or more courses are followed.

## Important

CIRAD cannot provide study grants. If you wish to request a grant, submit an application as soon as possible to national authorities in charge of livestock and/or scholarships; Cooperation and Cultural Action Services (SCAC) of your local French Embassy; the embassies of other countries; international organizations (FAO, UNDP, EU, IAEA, IDB ...); development projects or NGOs.

## Application procedure

Applications, consisting of a detailed resume, a motivation letter and details about the organization managing your grant, must be sent if possible before:

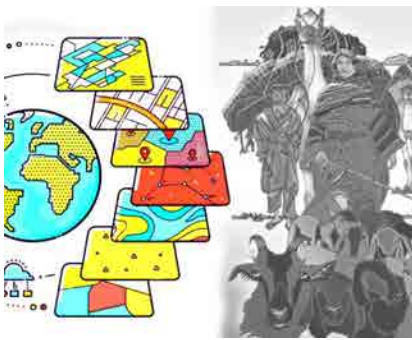
**25 October 2019**

by email: [formation-emvt-fvi@cirad.fr](mailto:formation-emvt-fvi@cirad.fr)

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# GIS applied to Epidemiological Surveillance

(Delivered in French)



Scientific coordinator

J-C SICARD  
(Cirad UMR ASTRE)

1 to 2 weeks  
2 - 13 December 2019

Epidemiology, and particularly epidemiological surveillance, seeks to represent the situation of a disease in a given area in order to take appropriate control measures or to develop hypotheses about the disease's origin and risk of dissemination.

A geographic information system (GIS) is a tool that enables the geographical representation of data. Coupled with the database of an epidemiological surveillance network, GIS can be used to map the outbreaks reported for a disease as well as their evolution in time and space. It also makes it possible to clearly visualize the animal population at risk, the risk factors, and the means of intervention that may be available on the ground.

By enabling the creation and the rapid and easy updating of maps representing a health situation highlighted by an epidemiological surveillance network, GIS provides public animal health authorities key elements for relevant and effective decisions.

Mastering a geographic information system has thus become a priority for those responsible for managing and analysing epidemiological data, as well as for services in charge of managing health interventions in the field.

## Course objectives

By the end of the course, participants will be able to:

- master all of the basic functions of QGIS 2.18.x software for creating maps;
- connect a database with this GIS software and represent the distribution of an animal disease and its evolution over time and space;
- conduct thematic analyses and make simple queries to represent and interpret data and produce maps to support decision-making.

# Audience

All candidates must have a good command of French.

## Week 1

This training course is for veterinarians, agricultural engineers and holders of a Master's degree or equivalent in subjects compatible with the content of the course.

Candidates who do not belong to these categories but who have sufficient professional experience also may join the course.

Candidates must be comfortable with computers (knowledge of the Windows environment) and basic office software concepts: file management, Word, Excel.

## Week 2

Master the basic functions of QGIS.



This module is part of the SEMHA and GIMAT master's programmes.



Crédit photo CIRAD

## Program

### Week 1: Getting started

- Concepts and becoming familiar with QGIS 2.18.x (concept of GIS, introduction to QGIS 2.18.x and presentation of functions).
- Mapping (design, trim, concepts of geo-referencing and projection, use of GPS receivers, acquisition and manipulation of geographic data, thematic analyses).

### Week 2: Deeper understanding

- Use of geodatabase and web resources.
- Application to epidemiological data (practical exercises, development of analysis, interpretation)
- Spatial analyses (raster and vector operators, creation of a processing chain)

## Cost

- Training cost : €800 for 1 week or €1,500 for 2 weeks
- Travel to Montpellier : to be determined by the participant
- Housing expenses : allow a minimum of about €90/day

If necessary, a customized estimate can be established upon request, especially when two or more courses are attended.

## Important

CIRAD cannot provide study grants. If you wish to request a grant, submit an application as soon as possible to national authorities in charge of livestock and/or scholarships; Cooperation and Cultural Action Services (SCAC) of your local French Embassy; the embassies of other countries; international organizations (FAO, UNDP, EU, IAEA, IDB ...); development projects or NGOs.

## Application procedure

Applications, consisting of a detailed resume, a motivation letter and details about the organization managing your grant, must be sent if possible before:

**4 November 2019**

by email: [formation-emvt-fvi@cirad.fr](mailto:formation-emvt-fvi@cirad.fr)



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# Applied training: Bases in Statistical Analyses with R (Delivered in French and English)



**Scientific coordinator**  
S. Thévenon & E. Loire  
(Cirad/IRD, UMR INTERTRYP  
Cirad/INRA, UMR ASTRE)

1 week  
14 to 18 October 2019

Data analysis is omnipresent in the research work. Unfortunately, poor design of an experiment or poor analysis of data can lead to the absence of interpretable results or to erroneous conclusions. Understanding the basic concepts of statistics is essential for the effective leading of a research project. Associated with this, the use of the R software allows simple, rapid and reproducible analyzes.

## Course objectives

At the end of the training, you will be able to analyze simple data sets using the R software.

Operational objectives:

- You will be able to distinguish different types of variables and their distributions and identify the relationships between variables
- You will be able to explore, describe and visualize your data with R
- You will be qualified to apply basic statistical tests with R
- You will guarantee the traceability and reproducibility of the analyzes
- You will design experimental or sampling plans in dialogue with a statistician

## Audience

This workshop is for students (Bachelor's degree+ 2 years), technicians (Bachelor's degree + 2 years), engineers or researchers wishing to acquire the bases in data analysis with R, for a practical use afterwards.

Prerequisites: Feel like learning!

Know how to manipulate files in Excel.

Ideally, have a set of data to analyze or have an experience to plan or in progress, for a short-term analysis.

Modular training

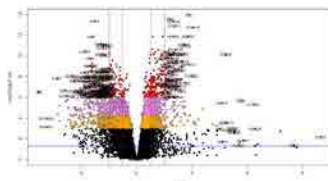
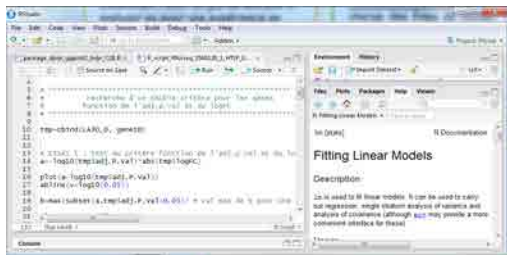


# Program and Organisation



- **Courses:** Theoretical presentations in PowerPoint, alternating with practical work with R, with simulated or real datasets and pre-established R scripts, to gain autonomy
- **Training at CIRAD in Montpellier (France)** (campus international de Baillarguet)  
Number of participants: maximum 12 / minimum 5
- **Itinerant training by invitation:** Support of the travel expenses, accommodation and expertise of the trainer(s) by the host organization with provision of a room equipped with computers for at least 1 student out of 2.

This training is on a full-time week. It can be delivered in French or English upon request.



## Cost

- Training cost at Cirad: €1,500
- Itinerant training with invitation: please contact us
- Travel expenses: not included
- Housing expenses: not included, plan a minimum of €90 a day

If necessary, a customized quote can be established upon request.

## Important

CIRAD cannot provide study grants. If you wish to request a grant, submit an application as soon as possible to national authorities in charge of livestock and/or scholarships; Cooperation and Cultural Action Services (SCAC) of your local French Embassy; the embassies of other countries; international organizations (FAO, UNDP, EU, IAEA, IDB ...); development projects or NGOs.

## Application procedure

Applications, consisting of a detailed resume, a motivation letter and details about the organization managing your grant, must be sent by email to [formation-emvt-fvi@cirad.fr](mailto:formation-emvt-fvi@cirad.fr).



See our other trainings : <http://formation-elevage-suds.cirad.fr>

# Engineering e-learning training (Delivered in French)



## Scientific coordinators

M. Dufour– C. Squarzoni-Diaw  
(Cirad Dgdrs - UMR ASTRE)

1 week

date to determine depending on the request

New information and communication technologies (ICTs) include digital tools and products that can be used in education and training (NICTE = NICT + Education).

They make it possible to reach an increasingly wider audience and to propose new kinds of training programs (in terms of the materials used and forms of organization). In particular, digital training (e-learning) permits the dissemination of knowledge in diverse fields of expertise.

To enable our partners to set up innovative training programs tailored to their audiences and needs, we offer our expertise in engineering e-learning training and multimedia educational programs. This training course is distinctive because it takes into account the specific features of countries in the Global South and can be adapted to all projects intending to use (partially or totally) e-learning.



*Crédit photo CIRAD*

## Course objectives

By the end of the course, participants will be able to:

- develop a digital training program: estimate the training needs and define clear learning objectives;
- define and use basic methodological tools of educational engineering (from teaching scenarios to evaluating the training activity);
- understand e-learning and multimedia content creation software, as well as LMS (learning management systems);

This course alternates theory with practical exercises that will allow you to start producing your own media-based training product (sound, video, animation, etc.).

# Audience

This training is intended for professionals active in the field of continuing education or teaching and/or knowledge transfer activities.

Participants should already have formulated an educational project which can be further developed during the course with regard to its implementation and target audiences (students, professionals).

Candidates must be familiar with computers and basic office software concepts.

A minimum of 7 participants is required for the course.

Course content and location can be modified upon request:

- on-site session in Montpellier,
- off-site session in your country.

This training can be organized upon request at any time during the year.



## Cost

- Training cost : €1,100
- Travel to Montpellier : to be determined by the participant
- Housing expenses : allow a minimum of about €90/day

If necessary, a customized estimate can be established upon request, especially when two or more courses are attended.

## Program

- The basic principles of distance learning
- Distance learning engineering
- Multimedia educational engineering
- Tools for creating content and providing distance learning courses



## Important

CIRAD cannot provide study grants. If you wish to request a grant, submit an application as soon as possible to national authorities in charge of livestock and/or scholarships; Cooperation and Cultural Action Services (SCAC) of your local French Embassy; the embassies of other countries; international organizations (FAO, UNDP, EU, IAEA, IDB ...); development projects or NGOs.

## Application procedure

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[formation-emvt-fvi@cirad.fr](mailto:formation-emvt-fvi@cirad.fr)



See our other trainings : <http://formation-elevage-suds.cirad.fr>





Program 2019-2020

e-learning



e-learning tools for epidemiology  
RANEMA - RANEMA-Stat - RANEMA-Flu



Aquaculture: Perspectives and Solutions



AmiquaLud

"Support for Quality Assurance (ISO/IEC 17025 Standard) for Animal Health Laboratories in Southern Countries"



Field Data Collection and Data Management



Peste des petits ruminants - PPR



Outbreak intervention

One Health investigation of outbreaks in Madagascar



## e-learning tools for epidemiology



### RANEMA

Nine self-training courses (without a tutor) are available free of charge on CIRAD's e-learning (distance learning) platform:

<https://elearning.cirad.fr/>

These courses are variations of three main modules set in different geographical contexts:

### RANEMA

This module is a refresher course in applied epidemiology of animal diseases. It was designed as part of a partnership between the [Veterinary School of Alfort](#) and our training team ([CIRAD-FVI](#)), with funding from the French Ministry of Foreign Affairs. RANEMA is structured around a simple scenario: trainees assume the role of veterinarians working for the veterinarian services of a virtual country named RANEMA. To carry out their duties, they must upgrade their knowledge of epidemiology by completing a set of activities. This module is available in several contextualized versions: Africa (in French and English), Asia (English), the Caribbean (French and English) and the Maghreb (French).

### RANEMA-Stat

This module was designed under a partnership between [ASTRE](#) joint CIRAD-INRA research unit, [SELMET](#) research unit, and CIRAD-FVI, our training team. Through interactive lessons and simulation exercises, trainees update and acquire notions of **statistics** that will be useful to them in understanding complex epidemiology concepts that they may encounter in the other RANEMA training modules. At the end of the course, trainees will be able to implement data collection techniques and train technicians for this purpose; calculate statistical results from a database and interpret them; establish tests for the different parameters to be monitored and determine the sampling required and confidence intervals. (delivered in French).

### RANEMA-Flu

Jointly designed by [UMR ASTRE](#) and [FAO](#) (AGAH / EMPRES), RANEMA-Flu is an interactive learning module on the prevention and control of Highly Pathogenic Avian Influenza H5N1. It provides information concerning the surveillance, prevention, detection, control and eradication measures that can be taken to control HPAI (delivered in French and English).

These modules were developed and validated by ASTRE epidemiologists through numerous professional training programs conducted in Africa and Asia, and in several master-level courses.



## Audience

The courses are intended for veterinarians, veterinary students or technicians, and health professionals who wish to refresh their understanding of fundamental concepts related to the epidemiology of animal diseases, statistics and avian influenza.

They are open to everyone.

## Course program

- This is a self-paced course; however, it is advisable to complete the programme over a short period (one or two weeks).
- Trainees study independently and are not tutored. However, they can contact the course instructor or the platform administrator in the case of a technical problem.
- Trainees can track their progress by doing the on-line exercises, which also determine their final score.



(except for the purchase of books)

## Recommended reference books

### For RANEMA :

- "Applied veterinary epidemiology and the control of disease in populations" by B. Toma, B. Dufour, J.-J. Bénet, M. Sanaa, A. Shaw and F. Moutou. 2010 (3rd edition) AEEMA publications. 2010 (3rd édition) AEEMA éditions.

### For RANEMA-STAT :

- "Statistique épidémiologique" by T. Ancelle, Paris, ed. Maloine. 2006.

## Accessing the courses

It is easier to connect to the course using Mozilla Firefox, a free and open-source web browser.



- Trainees must first connect to CIRAD's e-learning platform <http://elearning.cirad.fr> to create a profile. You then simply click on the course category of interest, in this case "Animal Epidemiology", then "RANEMA".

If necessary, contact: [david.chavernac@cirad.fr](mailto:david.chavernac@cirad.fr)

These training modules are available in French and English



**See our other trainings :** <http://formation-elevage-suds.cirad.fr>

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The organization of training courses in this field is part of its mandate.*





# Aquaculture: Perspectives and Solutions



Scientific coordinator  
Lionel Dabbadie (cirad – Isem)

This open-access training course is offered on the following CIRAD website:

<http://uved-formation-aquaculture.cirad.fr/>

## Background

Aquaculture is a vital source of jobs, food, and economic opportunities, especially for small rural communities in southern countries. It also has become a major economic activity: one fish in two intended for human consumption is now farm-raised, and nearly 40% of world production is traded internationally. Asia currently is the world's largest exporter and the European Union the largest importer. However, given that Asia is expected to account for 70% of world fish consumption by 2030, this balance could change significantly.

In response to the issues and challenges facing the sector, many nations are currently increasing their investments, but not without encountering some resistance due to rising criticism of aquaculture. Aquaculture is blamed for its impacts on the environment and biodiversity, its social consequences, the use of unsustainable raw materials such as fishmeal, and the quality and safety of some of its products.

There are, however, innovative technologies and methods of development that make it possible to envisage a sustainable future for the sector. The aim of this course, designed by specialists from CIRAD, IFREMER and IRD, is to take stock of modern aquaculture as it is currently practiced in the world.

## Contents and Objectives

This course proposes ten autonomous pedagogical units revolving around the theme "Aquaculture: Perspectives and Solutions".

The aim is to render learners able to:

- critically analyze the issues and risks of producing fish (in terms of food security, environmental impact, product quality, rural development options);
- describe the modern methods of aquaculture production (domestication, reproduction, genetic improvement, nutrition, water quality management, etc.);
- design strategies for the sustainable development of aquaculture at the scale of the farm and the territory.



e-learning

# Prerequisites

Basic knowledge in biological sciences, baccalaureate level (A level).



## Audience

This module could be used in master-level programmes on aquaculture, fisheries science, agronomy or agrifood, as well as BTSa/DU/L3/M1/M2 technical training programmes (managers or managers of aquaculture companies).



## Topics covered

- **Topic 1** - Aquaculture in the world: history, production, specificities (tropical/temperate, freshwater/marine, species), employment, market, prospects
- **Topic 2** - Domestication and biodiversity: ichthyological diversity, domestication, introduced species and local species, criteria for choosing a new species
- **Topic 3** - Reproduction: induced reproduction, controlled reproduction, sex control
- **Topic 4** - Genetic Improvement: aquaculture application of population genetics, cytogenetics and quantitative genetics
- **Topic 5** - Nutrition: nutritional requirements of fish, natural foods and fertilization, exogenous food, use of macro-algae and insects in fish farming
- **Topic 6** - Health and quality: importance of diseases in fish farming, socio-economic impact, interactions between environment, pathogen and host, animal welfare, health risks for humans, risk control
- **Topic 7** - Systems: fish farming system concept, dynamics of country and agro-industrial systems, impact assessment
- **Topic 8** - Sustainable production: offshore systems, recirculating aquaculture systems (RAS) and multi-trophic integrated systems (including freshwater aquaponics)
- **Topic 9** - Sustainable development: environmental dimension, gender and poverty, concept of socio-ecological system
- **Topic 10** - Case studies: examples of tropical (shrimp and milkfish, Philippines) and temperate (trout, La Canourgue) aquaculture.

## Possible uses

The educational content can be used in two different ways:

- As an introduction to the issues and practices of aquaculture: in this case, the video will be presented to audiences with fairly generalist profiles in the context of various training programs related to biology, agronomy or economics in which it will serve as an awareness-raising tool.
- As an introduction to specialized modules: in this case, the video will make it possible to situate the theme in the context of the issues at stake in world aquaculture. In this respect, it will serve as a guidance tool, both for learners seeking information on the various production and training sectors, and for instructors wishing to develop or enrich a lesson.



# Course program



This is a self-training course that learners can follow at their own speed; however, it is advisable to complete the programme over a short period (one or two weeks).

Each participant can work alone or supervised by an instructor.

Trainees can track their progress by doing the on-line exercises and quiz.

## Conditions of admission

- This module is intended for all levels of university students in scientific training programs holding basic notions of biology and/or agronomy. It also is intended for the general public interested in aquaculture. It does not replace a basic education in biology or agronomy, but shows how theoretical notions are applied in a sector such as aquaculture.
- There is no selection for the course. It is a self-training programme.

## Recommended reference books



- Aquaculture. C. Ferra, Vuibert, Paris
- Les carpes : biologie et élevage. R. Billard, QUAE Éditions, Paris
- La pisciculture tropicale. L. Dabbadie, O. Mikolasek, B. Chatain. Mémento du Forestier. QUAE Éditions, Paris

(except for the purchase of books)



## Accessing the module

- Candidates can freely access the module by connecting to the website:  
<http://uved-formation-aquaculture.cirad.fr/>

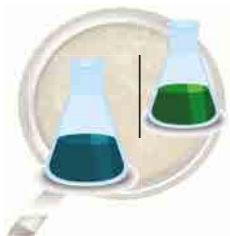
This digital resource is available in French with English subtitles.



Scientific contact : [lionel.dabbadie@cirad.fr](mailto:lionel.dabbadie@cirad.fr)

See our other trainings : <http://formation-elevage-suds.cirad.fr>





# AmiquaSud

"Support for Quality Assurance (ISO/IEC 17025 Standard) for Animal Health Laboratories in Southern Countries"

Magali Dufour (Cirad), Nicolas Keck (Adilva),  
Dominique Sionneau (Cirad), Cécile Squarzoni-Diaw (Cirad)



Improving performance in testing laboratories by providing awareness-raising and training tools for quality management systems is an important challenge for partners in the global South.

This self-training module is intended to facilitate the implementation of quality assurance (ISO/IEC 17025 standard) in animal health laboratories in southern countries. Initiated by [FVI](#), it was developed by CIRAD, FVI and [ADILVA](#) with funding from FAO, CIRAD and FVI.



## Objectives

- Assess the level of the quality management system (QMS) implemented in a laboratory
- When appropriate, identify the actions required to complement this QMS
- Acquire or improve knowledge and understanding of ISO/IEC 17025 v2005 requirements

## Program

This module consists of 10 independent chapters:

1. Organization, Policy and Quality Management System (QMS), Management Review
2. Purchase of services and supplies
3. Management of documents and records
4. Review of applications and contracts, Subcontracting, Client services, Claims
5. Control of work that fails to meet specifications, Improvement, Corrective actions, Preventive actions, Internal audits
6. Reports on results
7. Staff
8. Installation and ambient conditions
9. Methods, Traceability of measurement, Handling of test objects, Quality of test results
10. Equipment

Trainees can start work on the theme or activity of their choice. Each theme includes:

- an initial quiz to identify if the provisions of the QMS are in accordance with the requirements of Chapters 4 and 5 of the standard
- a course consisting of a series of educational activities explaining and detailing the requirements of the standard
- a final quiz to evaluate the knowledge acquired

A global quiz makes it possible to evaluate the initial level of the laboratory.

## Audience

Quality managers or heads of technical units or laboratories familiar with the basic notions of quality assurance in the ISO/IEC 17025 v2005 standard and supporting the quality assurance of their laboratory.

Anyone interested in the quality assurance of laboratories or technical units covering animal health or food hygiene or any other structure implementing a QMS according to this standard.



## Conditions of Admission

No prerequisites are required. Trainees evaluate their level through an initial quiz and choose the corresponding themes.

Access to the course is free regardless of the access mode (e-learning, online, offline mode).

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## Accessing the course

It is easier to connect to the course using Mozilla Firefox, the free and open-source web browser.

The course can be taken free of charge in three different ways:



- Online on the website <http://amigualsud.cirad.fr>
- Offline after downloading the site <http://amigualsud.cirad.fr> and installing the module on the computer.



- To access the course, trainees must first connect to CIRAD's e-learning platform <http://elearning.cirad.fr> to create a profile. You then simply click on the the corresponding course category, in this case "Quality Assurance" and then on "Amigualsud".

If necessary, contact: [david.chavernac@cirad.fr](mailto:david.chavernac@cirad.fr)

These training modules are available in French and English



**See our other trainings :** <http://formation-elevage-suds.cirad.fr>

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# Field Data Collection and Data Management

David Chavernac (Cirad)



In many scientific fields (veterinary and human health, forestry, agronomy in the broad sense), data collection and management is essential for monitoring, control and observation systems.

Today, new information and communication technologies are found everywhere on the planet. Data collection and management has never been closer to the field.

In this context, it is important to (i) make the right choice of tools and methods, and (ii) acquire the knowledge enabling their implementation and use.

## Objectives



Based entirely on free solutions, this training allows participants to:

- acquire general knowledge about information systems;
- create a mobile data collection application on smartphones and tablets;
- acquire the necessary knowledge to create a relational database for data management and analysis.

## Content

This training is divided into 3 distinct and independent modules:

- M1 : General knowledge about information systems, data collection, new technologies
- M2 : Creating a mobile application to collect data in the field
- M3 : Using a database management system

Although the modules are independent, it is nonetheless advisable to complete M1 before proceeding to M2 and/or M3.

## Audience

Anyone interested in data collection and management, whatever their activities. No IT skills are required, but it is essential to be comfortable with using a computer.

# Attend the training

This training can be attended in 3 different ways:



- full autonomy mode: Totally free, this one's own pace course allows the learner to do the training as often as s/he desires.
- semi-tutored mode: Modules can be combined as desired (M1 +M2, M1+ M3, M1 + M2 + M3) and completed at one's own pace. At the end of the training, a virtual 3-hour class allows the learner to take a global knowledge test and assess the program.
- tutored mode: Module M1 is completed autonomously. Each of the other modules (M2, M3) is then organized over one week. At the beginning of each week, a virtual 30 minute class allows the learner to fix objectives and receive intermediate assignments. Throughout the week, the learner can communicate as s/he wishes with the teacher to consolidate his/her knowledge. At the end of the training, a virtual 3-hour class allows the learner to take a global knowledge test and assess the training.

A certificate of attendance and achievement is delivered at the end of the training for the semi-tutored and tutored modes.

## Training fees

The fee depends on the training mode chosen:

- full autonomy: free
- semi-tutored: 70 €
- Tutored :
  - 200 € for M1+M2 or M1+M3,
  - 350 € for M1+M2+M3

If you choose the semi-tutored or tutored mode, please contact [formation-emvt-fvi@cirad.fr](mailto:formation-emvt-fvi@cirad.fr) for information on methods of payment and operating conditions. After acceptance of the quote and payment, the teacher will contact you to establish the course schedule.

## Terms of use

It is recommended to use Mozilla Firefox to follow these modules.



- Log onto the CIRAD e-learning platform <http://elearning.cirad.fr> and create a learner's profile.
- Sign up for each of the modules in the course category "Information Systems / Field Data Collection and Data Management".

If needed, contact: [david.chavernac@cirad.fr](mailto:david.chavernac@cirad.fr)

This training module is available in French and English.



**See our other trainings :** <http://formation-elevage-suds.cirad.fr>

# Peste des petits ruminants - PPR



## Scientific directors

Renaud Lancelot, Geneviève Libeau, Adama Diallo (Cirad-Astre)  
Joseph Domenech (OIE)

## Pedagogical directors

Georgette Charbonnier, Cécile Squarzoni-Diaw (Cirad-Astre-FVI)

PPR is a highly contagious transboundary viral disease affecting mainly goats and sheep, as well as dromedaries. Long overlooked, it is now present in most countries of Africa, the Near and Middle East, and Asia, causing considerable losses in livestock.

Despite the existence of a highly effective vaccine, PPR continues to spread geographically. Disease-free countries of the South and countries of the North are exposed to the risk of virus incursion and disease emergence.

Globally, over one billion small ruminants are exposed to the risk of PPR. The socio-economic consequences of the disease are often dramatic. PPR has a direct impact on the food security and livelihoods of the poorest populations and hinders rural development in the countries affected.

In March 2015, the FAO and OIE officially announced the implementation of a global PPR control strategy. Training and information sharing are essential accompanying measures for the eradication of this disease.

## Objectives



“Peste des petits ruminants – PPR” is a digital learning resource designed for self-learning. The contents are organized into 13 chapters. Quiz questions in each chapter enable learners to independently verify their understanding of the material.

Its purpose is to provide basic information about PPR, enabling learners to:

- explain the disease (clinical signs, hosts involved, transmission, epidemiology), understand the virus (lineages, mode of action, spread) and detect risk factors;
- catch up on field and laboratory diagnostic methods;
- provide convincing arguments supporting the use of vaccines to prevent and control the disease.

## Audience

This module seeks to reach a wide audience in countries of the South which are either affected by PPR or at risk of becoming so. It is intended for animal health professionals, veterinary schools, teachers, trainers, extension agents and journalists, livestock farmers, rural development stakeholders, the staff of national laboratories, animal health and epidemiological surveillance networks and stakeholders in the sheep, goat and camel sectors.

# Topics covered

- **Chapter 1** – Goats, sheep and people: the importance of small ruminant husbandry for poor populations in countries of the South (food security, economic independence, social and cultural role) and the critical need to fight devastating diseases like PPR
- **Chapter 2** – A long overlooked animal disease: presentation of essential information about PPR (Discovery, history, relationship with a disease of the past: rinderpest)
- **Chapter 3** – Unlocking the disease: the 4 clinical forms of the disease
- **Chapter 4** – Understanding the virus: identification of the pathogen. Classification, taxonomy and morphology. Evolutionary history and relationship to other viruses of the same genus (rinderpest virus, measles virus). External and internal structure (genome, viral proteins). Epigenetic characteristics (1 serotype, 4 lineages). Links between lineages
- **Chapter 5** – Susceptible and/or receptive hosts. PPR epidemiological cycle
- **Chapter 6** – The virus in action: virus transmission. Risk factors. Physiological, biochemical and immunological responses of an infected host. Multiplication cycle of the virus

Un contenu structuré pour l'apprentissage



## Quiz to self-assess your knowledge



- **Chapter 7** – Epidemiology of PPR: epidemiological forms of PPR: enzootic, epizootic. Factors driving the spread of PPR (livestock farming practices, animal mobility)
- **Chapter 8** – The geographic distribution of PPR: past and current geographic distribution of PPR. The factors driving the spread of PPR. The risk for Europe
- **Chapter 9** – Lineages on the move: geographic distribution of the 4 lineages of the virus before 2001. Genetic adaptation of the virus and current distribution of the lineages. Evolutionary history of the virus
- **Chapter 10** – Field diagnosis: Clinical diagnosis. Diagnosis of lesions
- **Chapter 11** – Laboratory diagnosis: Serological diagnosis. Virological diagnosis (detection of antigens and antibodies)
- **Chapter 12** – From the current preventive vaccine to a future curative vaccine: Heterologous vaccine. Homologous vaccine. Future recombinant vaccines. Future therapeutic vaccines
- **Chapter 13** – Towards the eradication of PPR: PPR's economic impact. Controlling PPR through vaccination campaigns (testimonials). Global PPR eradication strategy.

# Course program



- There is no required learning path. Learners proceed at their own pace and choose how they wish to navigate through the module: in order, starting with the first chapter and continuing through to the last chapter, out of order, skipping between units steered by their individual needs, interests and knowledge.
- At the end of each chapter, the learner can choose whether or not to take the associated self-assessment quiz. The results are automatically provided as a percentage of correct answers. The learner can then choose to consult the answer key or start again to improve his or her score. Choosing not to take the quiz does not block the learner from continuing through the course.
- Full text publications provide the opportunity to deepen knowledge about particular aspects of the subject.

Total estimated duration (learning and self-assessment activities): 10 to 15 hours



## Condition of admission

- There is no selection. This is a self-study course.
- No prerequisites are required, although background knowledge of biology, virology, and genetics could facilitate understanding of certain chapters.



## Terms of use

This resource can be accessed either:



- online on CIRAD's e-learning platform <http://elearning.cirad.fr> under "Animal Health".
- offline using a CD or USB key.
- A hard copy of the contents also is available in the form of an educational booklet which can be obtained free of charge at the following address: [formation-emvt-fvi@cirad.fr](mailto:formation-emvt-fvi@cirad.fr)



This digital resource is available in French and English.  



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# Outbreak intervention “One Health” investigation of outbreaks in Madagascar



Scientific coordinator  
Cécile Squarzoni Diaw  
(Cirad, UMR ASTRE)

The work of field epidemiologists is broad in scope and serves to provide rapid and concrete responses to health problems at the population level in order to inform animal health decisions. Intervention epidemiology brings together several specific activities, including epidemiological investigations, the assessment of a situation and risks, data processing...

This e-learning module, based on concrete field cases, enables professionals to review the main principles of field epidemiology by positioning the participant in situations involving analysis, investigation and decision-making.

## Objectives

This self-training material aims to help participants lead an investigation effectively and improve their practices in the field.

The course aims to:

- describe the different stages of an epidemiological investigation;
- formulate hypotheses on the dissemination pathways of a pathogen;
- develop a survey questionnaire;
- propose definitions of a case and a probable case in the context of an epidemic;
- understand and manage epidemiological indicators;
- build a clinical frequency table;
- construct and interpret an epidemic curve;
- list the risky practices that have contributed to the spread of a disease in the population;
- propose prevention and control measures in the two populations (animal and human).



## Program

The case study is divided into 5 parts and covers the different possible steps of an epidemiological field investigation. The scenario is based on real events and is enriched with specific data and situations in order to meet the educational objectives of the training module. The different fields of epidemiology -- descriptive epidemiology, analytic epidemiology and operational epidemiology -- are covered.

Several learning activities are proposed during the course for participants to test their knowledge and understanding of the concepts discussed, enabling a final score to be obtained. Different resources (scientific, internet, interviews with experts on the subject...) are included in the case study to improve participants' understanding of intervention epidemiology.

This self-study module requires 2 to 4 hours of work depending on the time spent consulting additional resources.



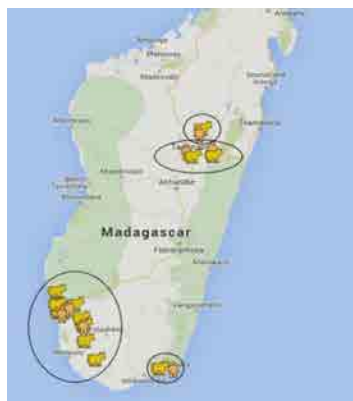
## Audience

This module, which takes the form of an online case study, is intended for field workers in animal health, health technicians, veterinarians, and health staff whose responsibilities include carrying out epidemiological investigations in animal health and public health.

## Training modes

The training can be undertaken in 3 different ways:

- Semi-autonomously: this module is offered during specific training sessions (master's or professional training programs) to provide access to a quality resource dedicated to field epidemiology. Access to the resource is available to participants once they have enrolled in the training program. They can then proceed through the material at their own pace and return to different sections as often as they wish.
- Semi-tutored: this resource is proposed as part of a classroom-based course to enable participants to use concepts discussed in class within a case study situation. The score obtained in this module may be integrated into the grade for the entire training program.
- As a means to assess one's knowledge: following a training course, this module can be used to test participants' knowledge and situation-based responses. The final score will be recorded on the e-learning platform by monitoring the completion of exercises.



## Cost

This digital teaching resource is accessible as part of specific training (professional training, Field Epidemiologist Technical Program...) or master's program (GIMAT) with no additional fees.

It is also available at a cost of €250 on the CIRAD e-learning platform, via pre-registration and a request sent by email to [formation-emvt-fvi@cirad.fr](mailto:formation-emvt-fvi@cirad.fr).

A certificate of participation and achievement (final score > 80%) may be issued upon request at the end of the course.

## How to use

It is easier to connect to the course online using Mozilla, the free and open-source web browser.



- Participants must first connect to CIRAD's e-learning platform <http://elearning.cirad.fr> to create a profile. To access the resource, simply send an email to [formation-emvt-fvi@cirad.fr](mailto:formation-emvt-fvi@cirad.fr) to receive an identification code after registration and payment.

If necessary, contact: [cecile.squarzonidiaw@cirad.fr](mailto:cecile.squarzonidiaw@cirad.fr)

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