FINAL REPORT of the Regional Workshop-training in Lao and Thailand, in human and animal Health:

"Diagnosis and epidemiology of trypanosomoses and their vectors in South East Asia"

Implemented by the *BioZoonoSEA* platform,
with the financial support of the French Ministry of Foreign Affairs,
and the contributions of *GREASE* network and *ComAcross* project.

Part 1:
Open-Workshop & Workshop-Training in Lao

5th-9thOctober 2015,

5thOctober 2015: Open workshop on: "Trypanosomes, hosts, reservoirs and vectors in a One-Health concept, in South East Asia"; *Centre d'Infectiologie Christophe Mérieux du Laos (CICML),* Ministry of Health PO. Box 3888; Vientiane

6th-9thOctober 2015: Registered workshop on:"Diagnosis and control of human and animal trypanosomes and their vectors in Asia; from field to laboratory"; NUOL, Nabong.

A *BioZoonoSEA* Workshop

Under the umbrellas of ***BioZoonoSEA***, the "Biotechnology Platform for Research and Training on Parasitic Zoonoses in South East Asia", **NAHIAT**, the "Network on Atypical Human Infections by Animal Trypanosomes", **GREASE** network "Management of Epidemiological Emerging Risk in South East Asia", and with the financial support of the **French Ministry of Foreign Affairs**, French Embassy, Bangkok, Thailand, and the **ComAcross** Project "Companion Approach for Cross-sectoral collaboration in health risks management in SEA", we have implemented a series of Workshop & Training entitled:

"Diagnosis and epidemiology of trypanosomoses and their vectors in South East Asia"

which was held in partnership with **Kasetsart University** (Thailand)**, Central Mindanao University** (Philippines)**,** and the French institutes **CIRAD** and **IRD**;

This Workshop / Training aimed at sharing knowledge and experience on trypanosomes and their vectors: diagnosis epidemiology, impact and control of the disease as well as trapping, identification, studies of transmission mechanisms, epidemiological impact as vectors and ways of control. In the future, this program will support the sustainable strengthening of Lao's veterinary services and university to control Surra. It also aims at developing joint research projects amongst French and South East Asian research institutes and universities.

Workshop coordinators:

Pr Sathaporn Jittapalapong, Faculty of Veterinary Medicine, Kasetsart University, Bangkok, Thailand; fvetspj@ku.ac.th

Dr Marc Desquesnes, CIRAD, International Center for Cooperation in Agricultural Research for Development, UMR InterTryp/FVM/KU, Thailand; marc.desquesnes@cirad.fr

Dr Vannaphone Putthana, NUOL, National University Of Lao, Nabong, Lao; vannaphoneputthana@yahoo.com

Dr Stéphane Herder, IRD, Institute of Research fort he Development, UMR IntreTryp/FVM/KU, Thailand: stephane.herder@ird.fr

Speakers and/or supervisors:

The main speakers were Dr Alan Dargantes (CMU, Philippines), Dr Marc Desquesnes (CIRAD, UMR InterTry/FVM KU), Dr Stéphane Herder (IRD/UMR InterTryp/FMV KU),Dr Roungthip Masmeatathip (FA/KU/KPS), Dr Serge Morand (CIRAD-AGIRs/CICML), and Dr Vannaphone Putthana (NUOL, Lao). Thipphakone Lacksivy (NUOL) and Piangjai Chalermwong (FVM/KU) assisted training and training translation.

Results and outputs knowledges were:

- an overview of the problem of trypanosomes in Asia;

- How to implement and interpret specific diagnosis of trypanosomoses in mammals, using parasitological, serological and DNA based methods;

- How to implement trapping and identification of the main genera/species of biting insects acting as mechanical vectors of trypanosomes in livestock;

- discussions on a draft of common research project for the control of biting insects;

- discussions to draft common strategy for epidemio-surveillance and impact evaluation of surra at the regional level, under the GREASE Network and ***BioZoonoSEA*** umbrella.

General schedule

This Workshop & training program was split into 3 parts: a one day *Open Workshop One Health* in Vientiane (*Centre d'Infectiologie Christophe Mérieux du Laos*), a 4-days *Workshop/Training* in Nabong (NUOL), and a 5 days training on the ***BioZoonoSEA*** platform (Kasetsart university, Bangkok, Thailand) for 12 young scientists or technicians from Lao, Philippines and Cambodia. All these objectives were made possible thanks to the financial support of the French Ministry of Foreign Affairs and the ComAcross project.

Partners:

- Faculty of Agriculture, National University of Laos, Nabong ; infrastructures are available in Nabong
- supporting institute: Veterinaries without borders (Vétérinaires sans frontières, Canada VWB/VSF) (implementing a development project to support livestock breeding in Lao).
- *Centre d'Infectiologie Christophe Mérieux du Laos (CICML),* Ministry of Health PO. Box 3888; Vientiane.

Group photo of the participants to the open Workshop on

"Trypanosomes, hosts, reservoirs and vectors in a One-Health concept, in South East Asia" CICML, 5th October 2015

Open Workshop

October 5th, 2015; Seminar at CICML, Vientiane

This “One Health Open workshop” was held under the umbrellas of the BioZoonoSEA Platform, the *NAHIAT* and *GREASE* networks, and the *ComAcross* project, in order to strengthen cross-sectorial and multidisciplinary exchanges about trypanosomosis survey and management among professional from different sectors (Animal health, human health, environment, rural development, NGO, private partners). Lectures and open discussions were held to develop future collaborations in the OneHealth (OH) conceptual framework, on trypanosomes and vectors, including livestock, wildlife, environment (both social and natural), veterinary and human medicine ; it was open to a large audience, including various scientific fields and geographical areas of Lao.

The open workshop gathered 52 participants from 5 countries (Lao, Philippines, Italy, Thailand and France); it was opened in the presence of Mr Jérôme Dubois-Mercent, representative of the French Embassy in Lao, Dr Philippe Girard, representative of CIRAD, Dr Vannaphone, Dr Phimpa and Dr Manolin, respectively representatives of NUOL and CICML.

Dr Ot Manolin Dir CICML; Jérôme Dubois-Mercent, SCAC, French Embassy Vientiane; Dr Vannaphone Putthana NUOL

P Girard, SEA-CIRAD delegate P Paboriboun, scient Dir CICML; Marc Desquesnes, CIRAD; Alan Dargantes CMU Philippines

11 lectures were given, covering the generalities on Trypanosomes and their vectors, overviewing and updating the situation of *Trypanosoma evansi* (surra) in Philippines, Thailand and Lao, the rodent’s trypanosomes (*T. lewisi, T. conorhini*) and *T. cruzi* (Chagas). It provided generalities and updates on the situation of haematophagous biting insects acting as mechanical vectors in South East Asia.




Stéphane Herder, IRD; Serge Morad, CIRAD AGIR's/CICML; R Masmeatathip, Fac Agr, Kasetsart U; M Camoin, VWB Lao



Participants Discussions Dr Phimpa P Paboriboun Participants

During the discussions the Lao participants emphasized on information and the needs on trypanosomes as follows:

Trypanosomes:

- it was emphasized that situations are diverse from a place to another, and from a host species to another, which makes the impact of disease difficult to evaluate ; the situation in Lao is not known since there was no recent studies on surra. However, the parasite is present and some outbreaks have been identified, especially in horses, in the past.
- Support and training on diagnosis of surra are requested, but the disease is not a priority for sanitary authorities;
- Medical and economic impacts cannot be evaluated since the diagnosis methods are rarely applied;
- Use of chemicals is large and not really under control, Diminazen aceturate is mostly employed
- It was suggested to use Diminazene aceturate (7mg/kg) in bovines, and to use Quynapiramine in horses only;
- In Lao, as in the other S-E Asian countries, evaluation of the economic impact of surra would be a priority; unless it is made, the disease will ever remain neglected.
- Impact of trypanosomes in humans is not known, although 2 *Trypanosoma* species largely distributed in SEA (*T. evansi* & *T. lewisi*) may be responsible of atypical human infections.
- The priority and first step would be to implement a serological survey in bovines to evaluate the prevalence of the infection.


Lunch time break at CICML

During the discussions the Lao participants emphasized on information and the needs on biting insects as follows:

Biting insects :

- Tabanids and stomoxes are known to be an important pest in livestock, but they have been very few studied, and the means of control are mostly limited to the use of sprayed insecticides, with more or less success.
- Support and training to investigate the hematophagous insects as vectors of surra is highly requested since there are almost no data available in Lao.
- There is need to identify a taxonomist in Lao, to refer to for biting insect studies;
- The use of insecticide in bovine farms would represent a high risk for human health due to residues in meat, milk and environment.
- All means of control should be developed, especially ecological ones and non-, or low-chemical ones, aiming at reducing the spread of insecticide through livestock industry.
- Training in insects as vectors may take time, so it was suggested to identify students (master ?) to work on that topic for several years in order to have sustainable skills in this field of investigation.
- Specific training of NUOL staff to the trapping and identification of insects is much expected, both during the registered workshop and possibly in a further specific training to be held in Bangkok early November 2015.

Closing ceremony

At the end of the day, Dr Desquesnes, workshop coordinator (CIRAD/Kasetsart University), Dr Ot (CICML) and Dr Vannaphone (NUOL) made a brief summary of the exchanges before group picture and closing ceremony.

List of participants : see at the end of the document.

Open Workshop schedule

October 5th, 2015; Seminar at CICML, Vientiane

Time	Programme	Speaker	Duration
International seminar on "Trypanosomes, hosts, reservoirs and vectors in a One-Health concept, in SEA"			
08.45 – 08.50	Opening Speech (OS) from the hosting CICML	Dr Ot Manolin & Dr Phimpha Paboriboune	5 min
08.50 – 08.55	OS the organizing institute NUOL	Vannaphone Putthana	5 min
08.55 – 09.00	OS French Embassy Vientiane	Jérôme Dubois-Mercent	5 min
09.00 – 09.05	OS CIRAD-ASEC	Phillippe Girard	5 min
09.05 – 09.15	OS a coordinator of *BioZoonoSEA*	Marc Desquesnes	10 min
09.15 – 09.30	**Coffee break 15 min**		
09.30 – 09.50	**L1** : One Heath / EcoHealth conceptual framework ***GREASE***	Stéphane Herder IRD/KU for Aurélie Binot CIRAD-AGIRs/KU	20 min
09.50 – 10.30	**L2** : ComAcross project	S Herder for A Binot CIRAD-AGIRs/KU	40 min
10.30 – 11.00	**L3** : Generalities on kinetoplastidae	S Herder IRD/KU	30 min
11.00 – 11.30	**L4**: Generalities on trypanosomes and the ***NAHIAT***:	M Desquesnes CIRAD/KU	30 min
11.30 – 12.00	**L5** : Rodents as reservoir of zoonotic pathogens	Serge Morand CIRAD-AGIRs/IM	30 min
12.00 – 12.30	**L6** : Surra and vectors in the Philippines	Alan Dargantes CMU	30 min
12.30 – 13.45	**Lunch Time 75 min**		
13.45 – 14.00	**L 7** : Tabanids as vectors of trypanosomes	M Desquesnes CIRAD/KU	15 min
14.00 – 14.15	**L 8** : Stomoxes as biting insects and vectors	Roungthip Masmeatathip, FA/KU	15 min
14.15 – 14.30	**L 9** : NUOL presentation and priorities, and Surra in Lao	V Putthana	15 min
14.30 – 15.00	**L 10** : VSF projects in Lao	Margot Camoin	30 min
15.00 – 15.15	**L 11** : Surra in Thailand	M Desquesnes CIRAD/KU	15 min
15.15 – 15.30	**Coffee break 15 min**		
15.30 – 16.55	Open Discussion on One Health Concepts: Biting flies and Trypanosomes	Stéphane Herder , M Desquesnes, V Putthana, P Paboriboune	85 min
16.55 – 17.00	Closing remarks	V Putthana & Ot Manolin	5 min

Registered Workshop
6th-9th October 2015
NUOL, Nabong


From 6th to 9th October 2015 the "Registered Workshop" limited to 26 participants was held at Nabong. This workshop / Training allowed giving lectures and practices on: (1) trypanosomes both in humans and animal reservoir in Asia, diagnosis methods and potential control methods, and (2) their transmission mechanisms and vectors, including trapping, identification and control. It included lectures, field work, practices and laboratory activities.


On 6th October an overview was given by Dr R Masmeatathip and M Desquesnes on biting insects, biology of stomoxyine flies and tabanids, the direct effect (nuisance) of the biting flies, including annoyance, stress, pain, toxic effects, skin lesions and blood spoliation, and the indirect effects of these mechanical vectors: pathogen transmission. The phenology of biting insects, including nycthemeral and seasonal activity. A field picture was given with the example of the situation in the Philippines. Trapping technologies were presented with a special emphasize on Vavoua, Malaise and Nzi traps that can be used in SEA to trap tabanids and stomoxes. Finally, a practical session was implemented to set up insect traps for biting flies in the Field: Malaise, Nzi and Vavoua traps.

Clearing is required before setting up the traps

NZI trap properly set up

Setting up of the Vavoua trap

Setting up of the NZI trap

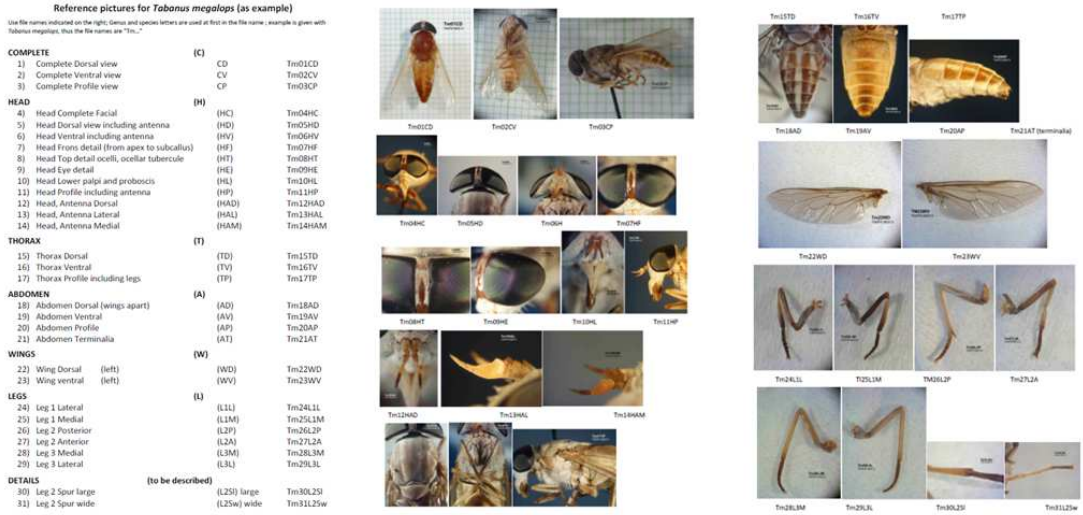
Setting up of the Malaise Trap

and final snap of successful cleaning !

On 7th of October, the morning session was devoted to identification of biting flies: generalities, Tabanids and stomoxyine flies identification, including genera and species *Stomoxys*, *Hematobia* and *Musca crassirostris*, were presented and further on carried out on the insects freshly trapped in the field.


In the afternoon, lectures were given by Dr S Herder on Trypanosomes genetic, evolution and classification. Methods for the preparation of DNA for molecular characterization of trypanosomes were presented. A practical session allowed tall participants to proceed Hematocrit Centrifuge Technique, blood smear preparation, fixation, staining and reading of the HCT and smears.


On 8th of October, the morning session was devoted to the guidelines to take pictures for the biting flies's description; biting flies trapped in NUOL were identified and pinned by Dr R Masmeatathip and M Desquesnes, in order to leave identified reference samples available at NUOL, for further studies.



Reference pictures for *Tabanus megalops* (as example)

Use file names indicated on the right; Genus and species letters are used at first in the file name ; example is given with *Tabanus megalops*, thus the file names are "Tm..."

COMPLETE		**(C)**	
1)	Complete Dorsal view	CD	Tm01CD
2)	Complete Ventral view	CV	Tm02CV
3)	Complete Profile view	CP	Tm03CP
HEAD		**(H)**	
4)	Head Complete Facial	(HC)	Tm04HC
5)	Head Dorsal view including antenna	(HD)	Tm05HD
6)	Head Ventral including antenna	(HV)	Tm06HV
7)	Head Frons detail (from apex to subcallus)	(HF)	Tm07HF
8)	Head Top detail ocelli, ocellar tubercule	(HT)	Tm08HT
9)	Head Eye detail	(HE)	Tm09HE
10)	Head Lower palpi and proboscis	(HL)	Tm10HL
11)	Head Profile including antenna	(HP)	Tm11HP
12)	Head, Antenna Dorsal	(HAD)	Tm12HAD
13)	Head, Antenna Lateral	(HAL)	Tm13HAL
14)	Head, Antenna Medial	(HAM)	Tm14HAM
THORAX		**(T)**	
15)	Thorax Dorsal	(TD)	Tm15TD
16)	Thorax Ventral	(TV)	Tm16TV
17)	Thorax Profile including legs	(TP)	Tm17TP
ABDOMEN		**(A)**	
18)	Abdomen Dorsal (wings apart)	(AD)	Tm18AD
19)	Abdomen Ventral	(AV)	Tm19AV
20)	Abdomen Profile	(AP)	Tm20AP
21)	Abdomen Terminalia	(AT)	Tm21AT
WINGS		**(W)**	
22)	Wing Dorsal (left)	(WD)	Tm22WD
23)	Wing ventral (left)	(WV)	Tm23WV
LEGS		**(L)**	
24)	Leg 1 Lateral	(L1L)	Tm24L1L
25)	Leg 1 Medial	(L1M)	Tm25L1M
26)	Leg 2 Posterior	(L2P)	Tm26L2P
27)	Leg 2 Anterior	(L2A)	Tm27L2A
28)	Leg 3 Medial	(L3M)	Tm28L3M
29)	Leg 3 Lateral	(L3L)	Tm29L3L
DETAILS		**(to be described)**	
30)	Leg 2 Spur large	(L2Sl) large	Tm30L2Sl
31)	Leg 2 Spur wide	(L2Sw) wide	Tm31L2Sw

In the afternoon, lectures were given on molecular characterization of Trypanosomes, PCR procedures and blood meal analysis in insect vectors. Lectures were given on serological diagnosis of trypanosomoses using CATT and ELISA techniques; a practical demonstration of the CATT was proceeded with and by the participants.


On the 9th of October, the morning session was devoted to the control of biting flies using traps and screens, as well as other methods of protection, repellent etc. In the afternoon, lecture and practical cases were presented on the control of trypanosome using trypanocides both in Thailand and the Philippines.

A discussion session was then opened in which participant drafted the after-workshop. Two mini-projects were proposed to evaluate the prevalence of surra in bovines in 3 provinces of Lao, and to study the biting fly activity (species identification and seasonal variation) in 3 provinces of Lao, to generate basic knowledge on their potential impact.

Certificates of attendance were given to all participants and lecturers of the workshop



Left to right: Dr Roungthip, Desquesnes & Manolin

Dr Khao and Desquesnes

Closing ceremony was followed by a last group picture.

Registered Workshop schedule

Tuesday, October 6th, 2015:

Biting insects biology & trapping

Time	Programme	Lecture/Speaker	Remark
09.00 – 09.30 30 min	**Lecture 1** : An overview on biting insects	Marc Desquesnes, CIRAD./KU	T
09.30 – 09.50 20 min	**L2** : Biology of stomoxyine flies	R Masmeatathip, FA/KPS/KU	T
09.50 – 10.20 30 min	**L3** : Biology and direct effects of Tabanids	M Desquesnes, CIRAD/KU	T
10.20 – 10.45 25 min	**L4 :** Biting flies of veterinary importance in the Philippines	A Dargantes	T
10.45– 11.00	**Coffee break**	**15min**	
11.00 – 11.30 30 min	**L5** : Seasonality of stomoxes and tabanids in Thailand	R Masmeatathip	T
11.30 – 12.30 60 min	**L6**: Trapping technologies for biting flies	M. Desquesnes, CIRAD/KU	T
12.30 – 13.30	**Lunch Time**	**60 min**	
13.30 – 16.30 3 hours	**Field trip 1 (F1):** Setting up of insect traps for biting flies in the Field: Malaise, Nzi and Vavoua traps	Dr M Desquesnes Dr R Masmeatathip Dr A Dargantes Piangjai &Thippakone and all participants	**FT1**

Wednesday, October 7th, 2015:

Biting flies trapping & identification

Trypanosome DNA based identification

Time	Programme	Lecture/Speaker	Remark
9.00 – 10.00 60 min	**L7**: Identification of biting flies: generalities &Tabanids	M Desquesnes CIRAD/KU	T
10.00 – 10.30 30 min	**L8**: Identification of *Stomoxys*, *Hematobia* and *Musca crassirostris*	R Masmeatathip, FA/KPS/KU	T
10.30 – 10.45	**Coffee break**	**15 min**	
10.45 – 11.15	**Field trip 2:** collection of biting flies trapped in the field	M Desquesnes, R Masmeatathip, A Darantes Piangjai &Tippakone and all participants	**FT2**
11.15 –12.30 75 min	**PW1:** Genus identification of the biting insects captured	R Masmeatathip, FA/KU M Desquesnes CIRAD/KU	**PW1**
12.30 – 13.15	**Lunch Time**	**45 min**	
13.15 – 13.45 30 min	**L9**: Biting flies control	Marc Desquesnes	T
13.45 – 14.15 30 min	**L10:** Trypanosomes genetic, evolution and classification	S Herder IRD/KU	T
14.15 – 14.45 30 min	**L11:**Preparation of DNA for molecular characterization of trypanosomes	S Herder IRD/KU	T
14.45 – 16.15 75 min	**PW2:** Preparation of samples and DNA for PCR: filter paper and Chelex	S Herder IRD/KU	**PW2**
16.15 – 17.30	**Field trip 3:**collect of biting flies trapped in the field and removal of the traps; freezing of the insects	M Desquesnes R Masmeatathip A Dargantes, Piangjai & Tippakone and all participants	**FT3**

Thursday, October 8th, 2015:

Biting flies& Trypanosomes: identification

One team is going to collect blood from bovines

Time	Programme	Lecture/Speaker	Remarks
8.30 – 9.00 30 min	**PW3**: Picture chart for biting flies's description	M Desquesnes	**PW3**
09.00 – 10.30 1.30 hours	**PW4:** Biting flies identification and pinning	M Desquesnes R Masmeatathip, A Dargantes	**PW4**
10.30 – 10.45	**Coffee break**	**15 min**	
10.45 – 11.15	**L12** : Parasitological diagnosis of Trypanosomes	M Desquesnes	T
11.15 – 12.15	**PW5** : Parasitological diagnosis of Trypanosomes (HCT and GSBS +/- MI)	M Desquesnes & Piangjai, Tippakone & A Dargantes	**PW5**
12.15 – 13.00	**Lunch Time**	**45 min**	
13.00 – 13.30	**L13** : Molecular characterization of Trypanosomes	S Herder	T
13.30 – 15.00 90 min	**PW6:** Practice of PCR for trypanosome identification: master mixed, thermocycling and gel preparation	S Herder, M Desquesnes,	**PW6**
15.00 – 15.30	**L14** : Serological diagnosis of Trypanosomes	M Desquesnes	T
15.30 – 16.00	**PW7:** CATT test& **ELISA** coating	M Desquesnes, Piangjai & Tippakone	**PW7**
16.00 – 16.15	**Coffee break**	**15 min**	
16.15 – 16.45 30 min	**PW8:** Practice of PCR for trypanosome identification: gel loading and electrophoretic migration	S Herder, M Desquesnes,	**PW8**
16.45– 17.00	**L15** : Blood meal analysis in insect vectors	S Herder,	T
17.00 – 17.30 30 min	**PW9:** Practice of PCR for trypanosome identification: lecture of the gel	S Herder, M Desquesnes,	**PW9**

Friday, October 9th, 2015:

Trypanosomes: parasitological, serological and molecular diagnosis

Time	Programme	Lecture/Speaker	Remarks
09.00 – 11.00 3hours	**Practical work 10:** serological diagnostic using ELISA	M Desquesnes, Piangjai & Tippakone	**PW10**
11.00 – 11.45	**L16** : Trypanosome diagnosis: interpretation of results	M Desquesnes	T
11.45 – 12.30	**L17 :** Generalities on the control of surra	Dr. Marc Desquesnes	T
12.30 – 13.30	**Lunch Time**	**60 min**	
14.00 – 15.00	**L18 :** Impact and Control of surra in the Philippines	A Dargantes	T
15.15 – 16.15 60 min	Questions and discussions	All participants	
16.15 – 16.30	**Closing ceremony** **Distribution of the certificates of attendance**	All participants	

List of the participants

No	Name, title & Institution	Origin (Province)	email
1	Vannaphone Putthana, **NUOL**	Vientiane, Lao	vannaphoneputthana@yahoo.com
2	Dr Ot Manolin general director of **CICML**	Vientiane, Lao	manolinot@ccm-laos.org
3	Dr Phimpha Paboriboune, scientific director, **CICML**	Vientiane, Lao	phimpha@ccm-laos.org
4	Serge Morand, **CIRAD** AGIRs	Vientiane, Lao	serge.morand@univ-montp2.fr
5	Margot CAMOIN, **VWB**	Vientiane, Lao	margot@vetswithoutborders.ca
6	Marc Desquesnes, **CIRAD**/KU	Bangkok, Thailand	marc.desquesnes@cirad.fr
7	Stéphane Herder, **IRD**/KU	Bangkok, Thailand	stephane.herder@ird.fr
8	RoungthipMasmeatathip FA /**KU/**KPS	Kampangsaen, Thailand	fagrrtm@ku.ac.th
9	Alan Dargantes, **CMU**	Bukidnon, Philippines	alan_dargantes@yahoo.com
10	Philippe Girard, DRASEC, **CIRAD**	Hanoi, Vietnam	philippe.girard@cirad.fr
11	M. Jérôme Dubois-Mercent, le Conseiller de coopération et d'action culturelle **Ambassade de France**	Ambassade de France Vientiane, Lao	jerome.dubois-mercent@diplomatie.gouv.fr
12	Marc Souris, **IRD** Representative in Lao	Vientiane, Lao	marc.souris@ird.fr
13	Mr. Nicola Xagnaghi	International Veterinary Center, Vientiane, Laos	info@ivclao.asia
14	Dehaluon Meunsaen	FAG NUOL	
15	Lao vet from IVS	International Veterinary Center, Vientiane, Laos	info@ivclao.asia
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17	Keokorlakot	Capitals PAFO	
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19	Souksavarth	from Section of Animals - Fishery PAFO of Phongsali	
20	Khampasert	from section of Animal - fishery PAFO of Borlikhamxay	
21	Vatsana Chanthavong	Lao Elephant Care & Management	vatsana.chanthavong@yahoo.com

		program/Elefantasia/DLF	
22	representative	from Section of Animal - Fishery PAFO of Savanhnakhet	
23	Sophie Bosh	Laos Wildlife Rescue	sophiebosch@gmail.com
24	Phengkhane bounvatsana	Thakhek Hospital	phengkhane@gmail.com
25	Sophie Bosh	Lao Wildlife Rescue Center	sophiebosch@gmail.com
26	representative from IFMT	MOH	
27	Dr SisengKhoungsy	FMD project Luang Prabang	
28	Khamphay	from Animals Health Center PAFO of Champasuk	Jo.pakse@gmail.com
29	representative	Other SDC funded project?	
30	**Dean of FAG**	Faculty of Agriculture, NUOL	
31	Kham Phommachanh	Head of Department of livestock and fishery, FAG, NUOL.	
32	Assoc. prof. Thonglom phoumavong	Department of livestock and fishery, FAG, NUOL.	
33	Chantha Chanda	Department of livestock and fishery, FAG, NUOL.	
34	Saivisen	from Department of Economical and food safety FAG, NUOL.	
35	Dr. Phachone	from Veterinary Division DLF, MAF	
36	Souk Phomehuksa	from Animals Health Laboratory center MAF	
37	Dr. Wattana theppanya	from National Animals health Laboratory DLF, MAF	
38	representative Epidemiology center	Epidemiology center	
39	Dr. Soulapharp	from Sethathilarth Hospital MOH	
40	representative	from Mahosrth Hospital MOH	
41	representative from DAFO of Hartsaiphong district	from DAFO of Hartsaiphong district Vientiane Capital	
42	representative	from Mittapharp Hospital Vientiane Capital	
43	representative from DAFO of Parkngeum district	DAFO of Parkngeum district Vientiane Capital	
44	representative University of Health	University of Health MOH	
45	Phout Inthavong	from DLF MAF	

46	Chintana	from DLF MAF	
47	representative from DAFO of Nasaithong district	DAFO of Nasaithong district	
48	representative from DAFO of Saithany district	DAFO of Saithany district	
49	representative from Veterinary Unit	Section of Animals and Fisery, PAFO, VTE Capital	
50	representatives from Epidemiology Division	Epidemiology Division MOH	
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