



Vulnerabilities and adaptation changes  
in the Lao Uplands  
Exploring Pathways Towards Resilience



LAO  
UPLANDS  
*Initiative*



mobile4D  
Crowdsourced Disaster Alerting  
System on Smartphones  
DALaM, MAF, 23 February 2018



AGRICULTURAL RESEARCH  
FOR DEVELOPMENT

CDE  
CENTRE FOR DEVELOPMENT  
AND ENVIRONMENT

## Contributed organization

- MAF, Lao PDR
- Capacity Lab, University of Bremen, Germany
- Decide, CDE, University of Bern, Switzerland

## The System Components Smartphone App



- Send out warnings
- Receive warnings (location based)
- Contact other people



## The System Components Web-Administration



- Send out warnings
- Administration: combine, edit, close warnings
- Provide further help (e.g. safety advice)

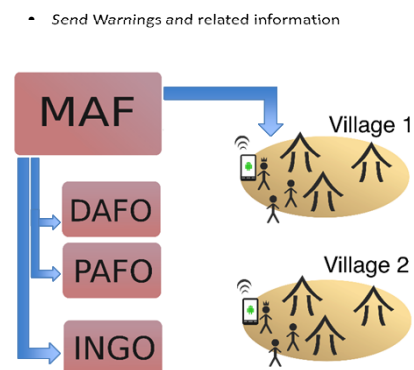
## The System Components Cloud-Server



- Handles incoming warnings
- Sends out notifications to people in danger
- Is connected to the crowd server

## Information Flow Top-Down

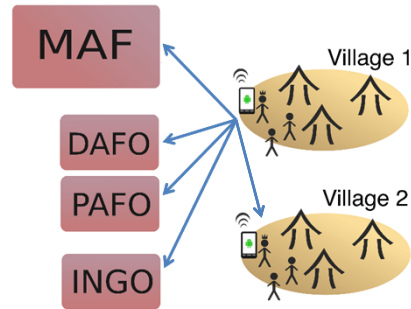
- Ministry (or other administrative layer) can provide disaster alerts
- Alerts received by:
  - affected people (based on location)
  - affected governmental institutions
  - NGOs



## Information Flow Bottom-Up

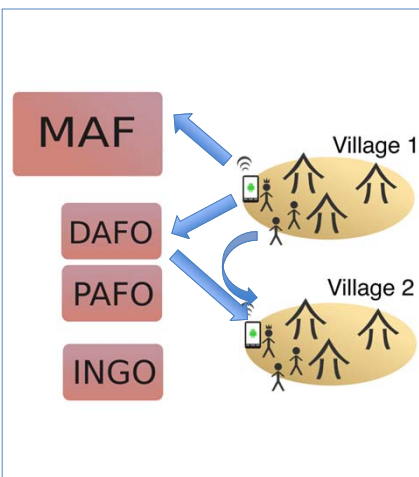
- Send warnings and related information

- Users at local level report first hand information
- Existing warnings can be verified and updated
- Local information directly reaches other affected local people / administration



## Locality

- Decentralized concept
- Also works in small local groups
  - Example: If only DAFO would be active, information would still reach other people affected
  - Would also work without any administrative layers

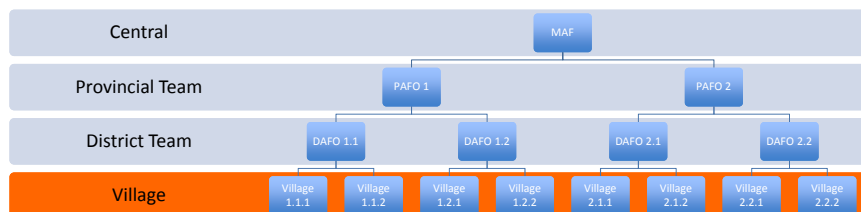


## Awareness of bad Connectivity

- System adapts to low bandwidth / bad connectivity
- Important information is always sent first
- Large data sets (images etc.) are first sent in very low resolution
- In case of no connectivity, uploads are halted and continued later
- Background service (invisible to user)

9

## Reporting flow at present by phone call and GPS survey verification



## **Mobile4D System Component**

### **i.) Government/Administration**

- Can send alerts *directly* to people affected
  - Responsible PAFO
  - Responsible DAFO
  - Individual users in villages
- Verify, confirm, update alerts from users
- Directly contact reporters and affected people
- Get overview/measures of disaster situation
- Can send information material to affected people

### **ii.)Registered Users**

- Registered khumban/village persons responsible for the disaster report
- Can report disasters *directly* to
  - Responsible PAFO
  - Responsible DAFO
  - Users nearby
- Update disaster status, add more details
- Can receive information material
- Can be contacted by government/administration
- Can distribute warnings to friends and neighbors

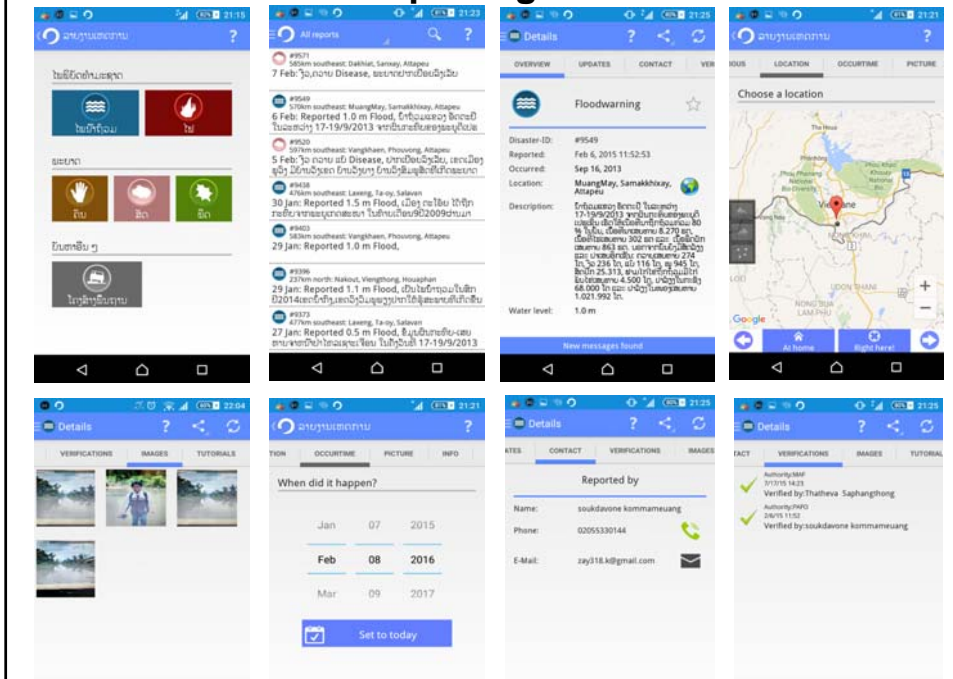
### iii.) Non-Registered Users

- Everyone using the app
- Can receive all warnings and updates for their areas
- Can receive and use all information material
- Potentially open for everyone

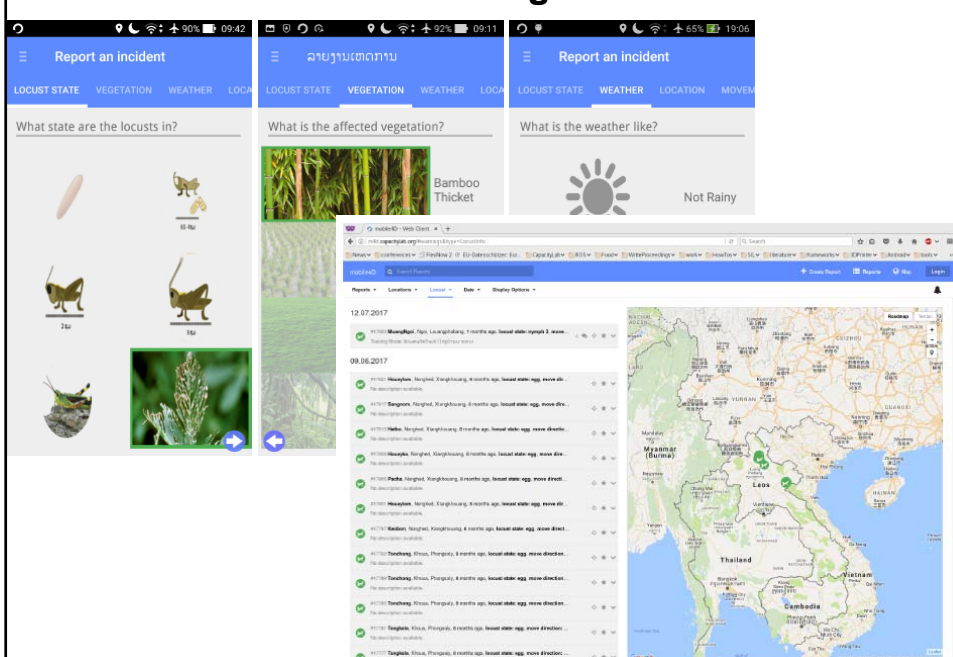
### Pilot Test

- 2014
  - Disaster Monitoring
    - Vientiane Capital (CST, DOA, DOLF and DOPC, MAF)
    - Luangprabang (Luangprabang, Chomphet and Pak Ou)
- 2015
  - MAF (CST, DoPC)
  - Sekong (Kaleum, Dak Cheung)
  - Saravan (Taoi, Samuay)
  - Attapeu (Sanexay, Phouvong)
- 2016-2017
  - Locusts Monitoring
    - Luangprabang (Ngoi, Viengkham, Nambak, Phonsay, Pakou)
    - Houaphanh (Heam)

## 2015-2016: Disaster reporting function



## 2016-2017: Locust monitoring function





2018

**Mobile4D**  
Disaster Warning System

**Disaster Reporting**  
Laos inhabitants have the opportunity to report occurring disasters. With this information, the Laotian government can launch countermeasures to help people right on the spot.

**Report Overview**  
Once a report has been created, it will be listed in a structured overview in which reports can be monitored and tracked by authorized people.

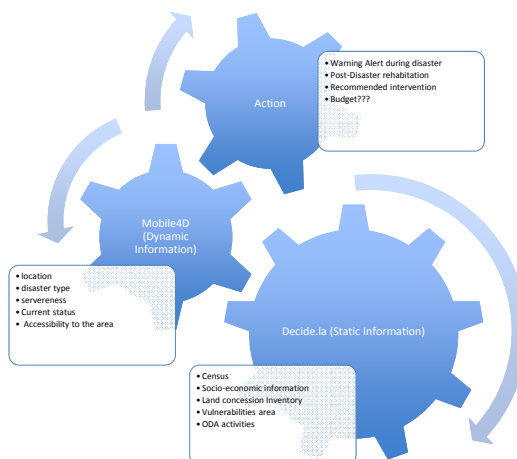
**Government Integration**  
In case of an occurring disaster, the Laotians can call responsible officials if necessary. These officials are location-dependent and will be tracked by the application.

**Different Disasters**  
At the moment, disasters which can be reported are fires, floods, droughts, infrastructural problems, locust plagues or plant, animal and human diseases. If necessary, our sustainable development enables the adding of new types of disasters in a flexible kind.

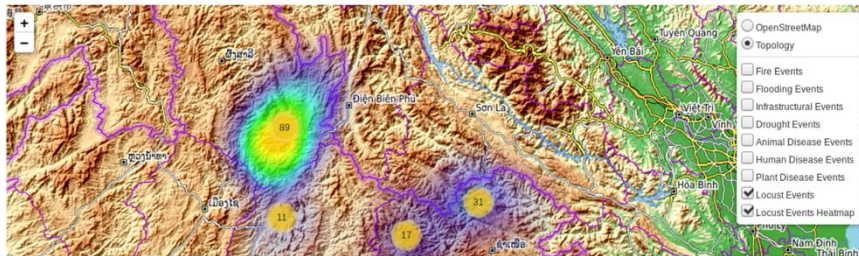
Mobile4D interface features:  
 - Create a Report  
 - View Reports  
 - Call an Official  
 - Settings

Disaster types shown:  
 - Fire  
 - Drought  
 - Flood

## Information consolidation mechanism



## Presentation to local decision



## Constrains and perspectives

- Technical
  - System is sometime down so the service has not be able to provide full time services
  - Mobile phone battery life time is short with the GPRS/3G function
- Financial
  - Limited number of android mobile for the dedicated reporter
- Human capacity
  - There is and urgent needs for more TOT at provincial, district and Khumban staffs

## Future Activities

- **Further development with the soil properties monitoring module with DALaM**
- **Expand collaboration with MLSW, MoNRE, MOPH, MPWT, MEM, DMCC and CSOs to promote wide use of Mobile4D**
- **To be geographical full coverage of Lao PDR**

## Thank You for Your Attention!

- [www.decide.la](http://www.decide.la)
- <http://mobile4d.capacitylab.org>
- <http://dalam.maf.gov.la>