CAP on a Map – Improving Institutional Responsiveness to Coastal Hazards through Multi-agency Situational Awareness

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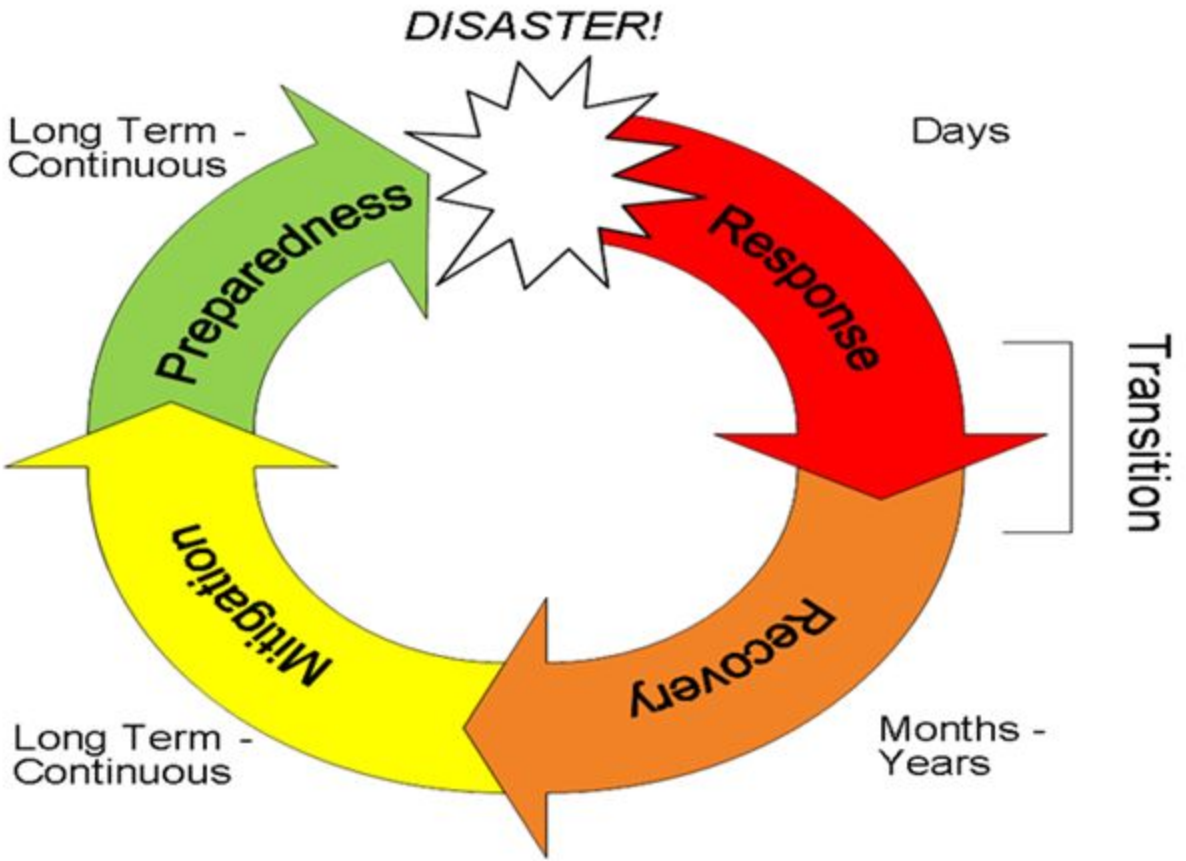
Disaster Management Lifecycle



Disaster Phase

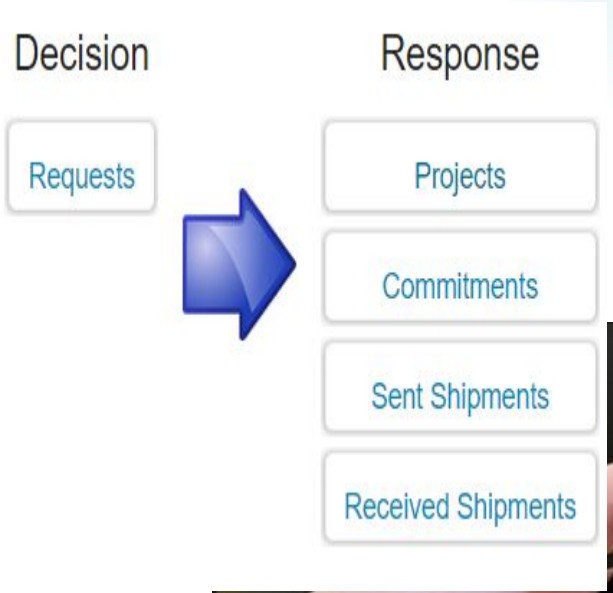
Pre-Disaster

- Common pursue: **Situational Awareness**
- Depends on the type of Organisation - Governmental, NGO, Private, Red Cross/ Red Crescent, etc.
- Staffs, Volunteers, Incident reporting and situational awareness, disaster risk assessments, assets management and track, tracking inventory items/stocks, etc.

Disaster Phase

In-Disaster

- Crucial time-period for any kind of disaster
- Location based early warnings/alerting
- Support requests coming-in.
- Distributing resources according to request, need and availability.
- Rapid response, managing mass population and increasing awareness.
- Tracking who is what/where/when?



Disaster Phase

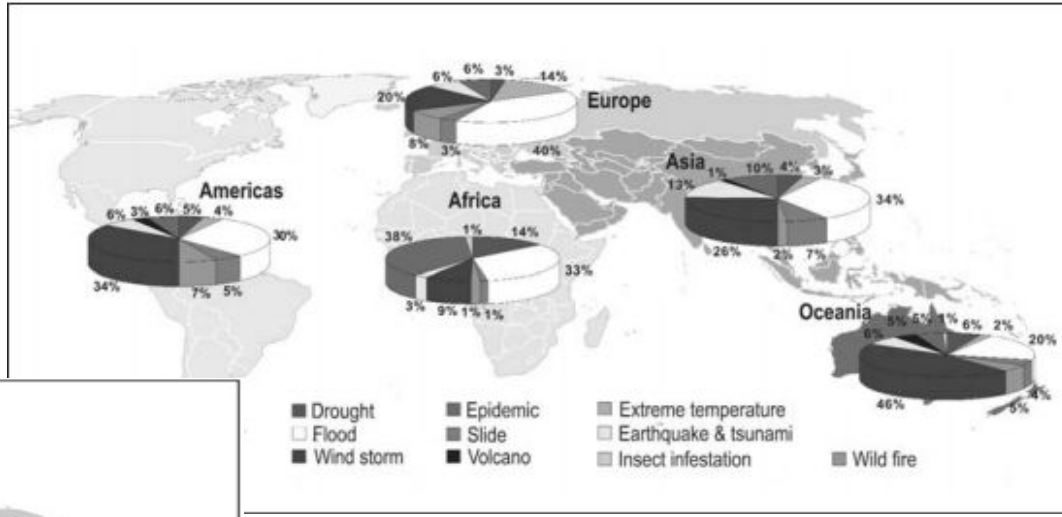
Post-Disaster

- Recovery and mitigation
- Takes months upto years
- Collecting data and records for reconstruction.
- Managing projects, sending shipments, tracking progress. Shelters, victim registry management and preparing for future.

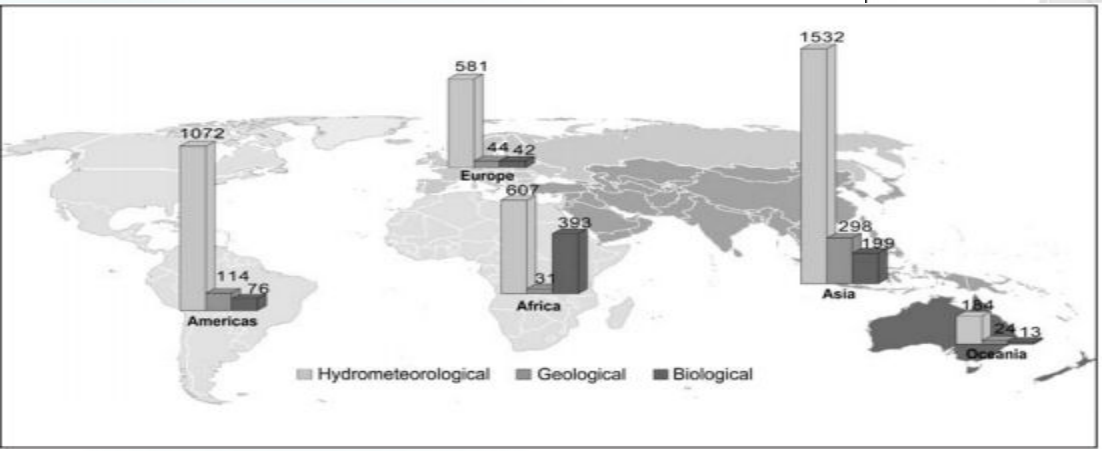
Disaster Management System

- The **Asia-Pacific region** is one of the most risk-prone areas for disasters, based on disaster occurrences since 1995.

- A key reason for this is the **implementation of effective disaster warning systems and evacuation procedures** *used by the developed countries*.

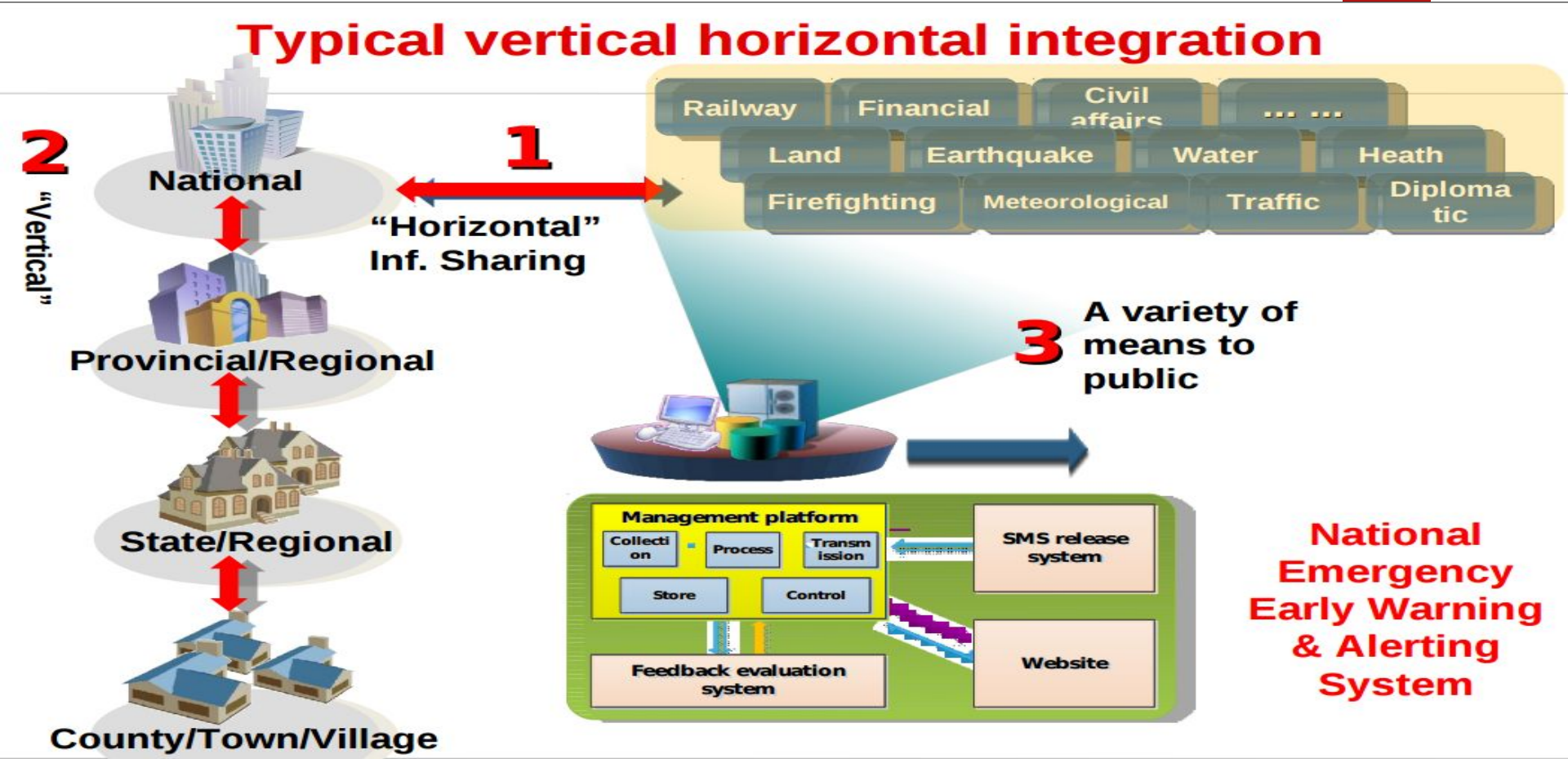


Regional Distribution of Disasters: By Triggering Hazards, 1995–2004.
Source: (base map): UNEP/DEWA/GRID-Europe, November 2004



Number of Disasters by Origin: Regional Distribution, 1995–2004.
Source (base map): UNEP/DEWA/GRID-Europe. November 2004

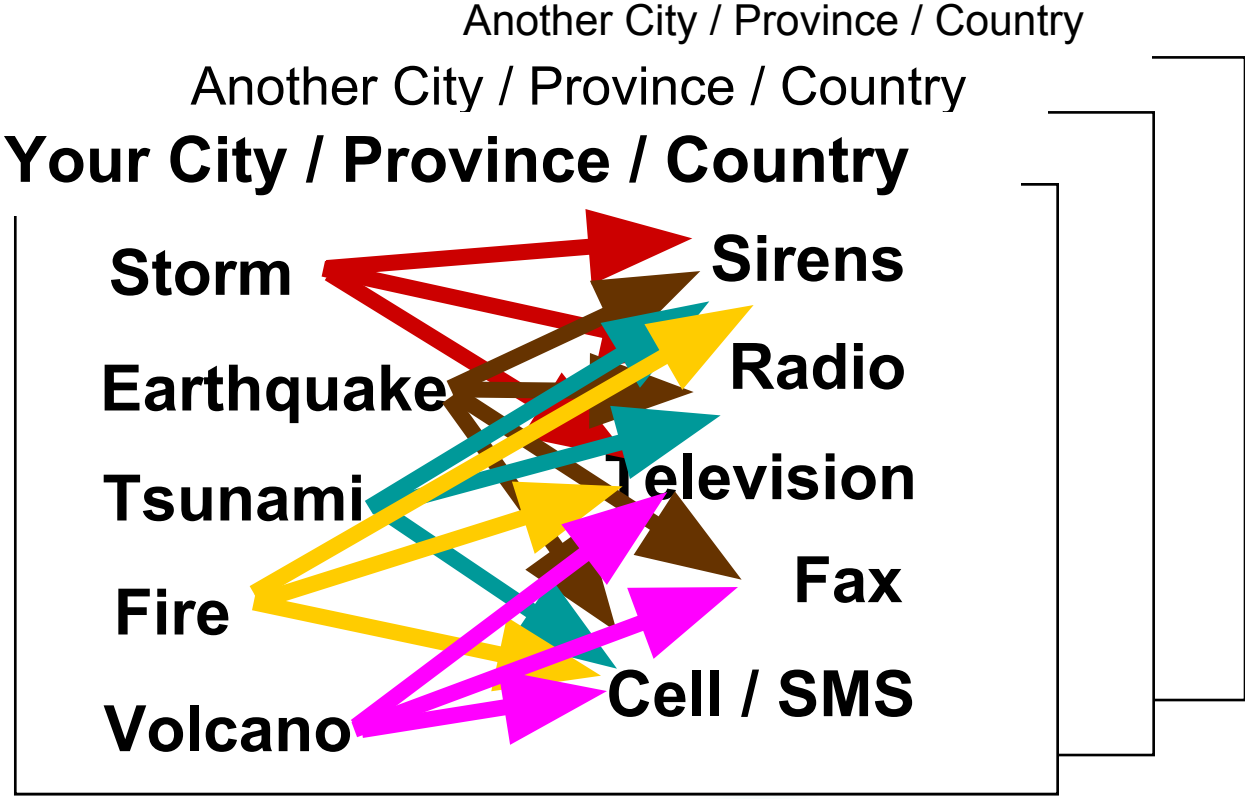
Disaster Management System



The Challenge of Alerting

All governments have various public alerting systems:

- **Earthquakes/tsunami** by e-mail, news wire, Web sites, pagers, telephone calls ...
- **Weather** by news wire, fax, radio, television, e-mail, SMS text on cell phones ...
- **Fire, Security, Transportation** by television, radio, sirens, police with bullhorns...



Disaster Management System

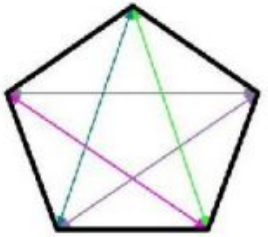
Channels used for Disaster Warning

- Radio and Television
- Telephone (Fixed and Mobile)
- SMS
- Cell Broadcasting
- Satellite Radio
- Email
- Amateur and community radios.
- Sirens
- Twitter/ Facebook
- RSS
- FTP etc.

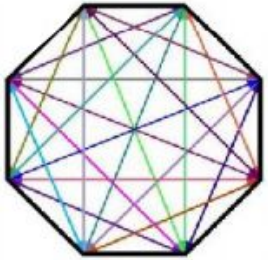
Source: International Telecommunication Union (ITU)

Disaster Management System

- Channels N(N-1)/2 = O(N^2)
- Information Lost in relay and propagation
- Redundant Data Collection
- Inconsistent Terminology
- Manual Collation / Calculation
- Delayed Situational-Awareness



N=5



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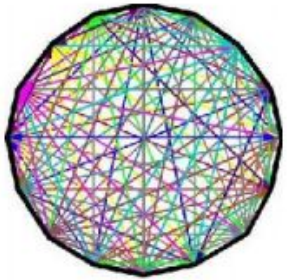

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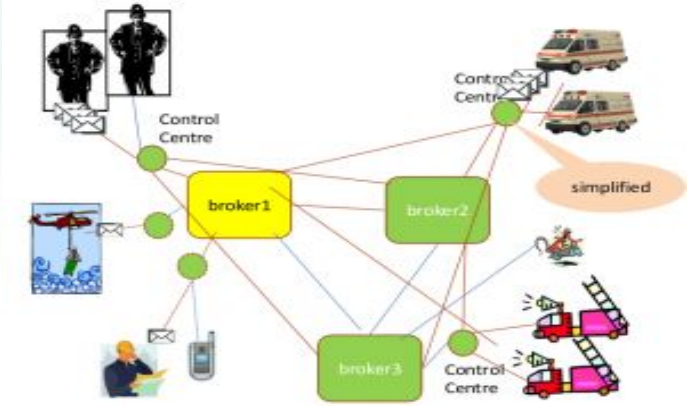
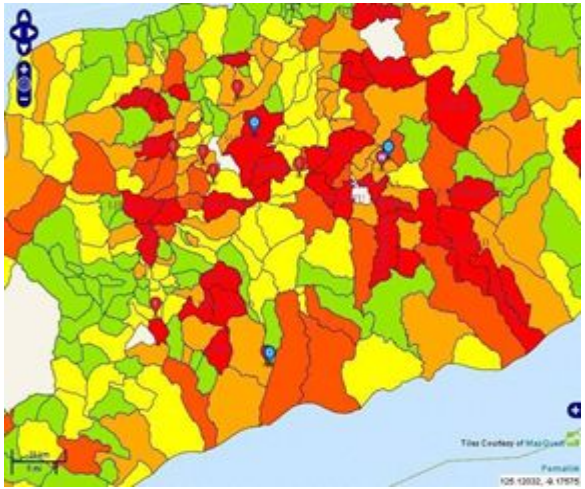
Sahana Alerting and Messaging Broker (SAMBRO) Dilutes the Complexities

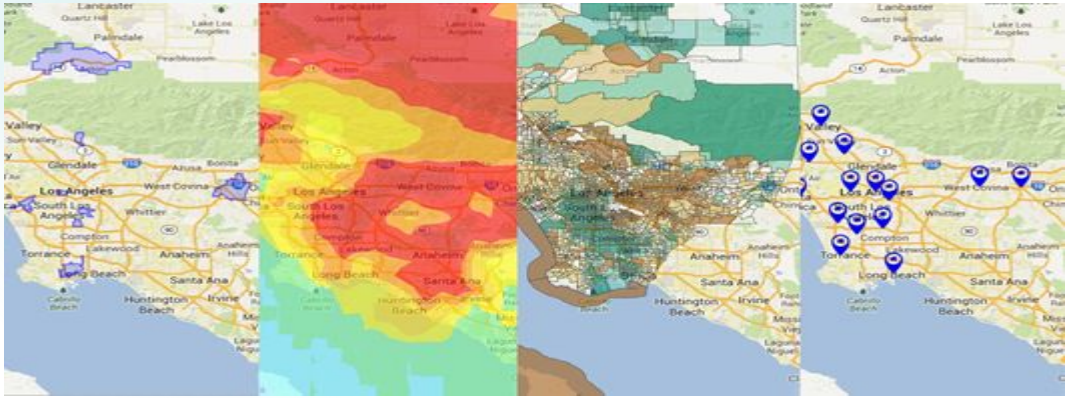


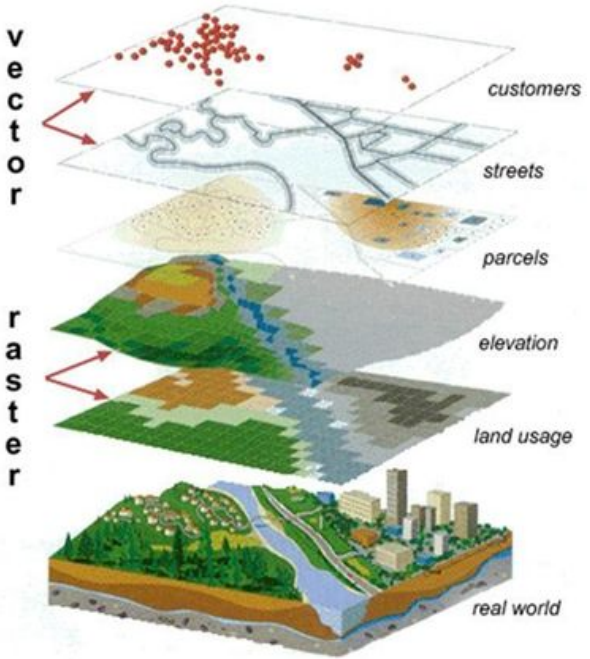
- **Common Alerting Protocol** (**CAP**) interoperable warning standard allows for **all-hazard all-media** information exchange
- Open-source Sahana system improves coordination, consistency, completeness, coverage, and control
- Single entry of a message is shared through multiple channels with relevant emergency responders and public
- Increases warning efficiencies, situational-awareness and simplifies knowledge mobilization

Mapping

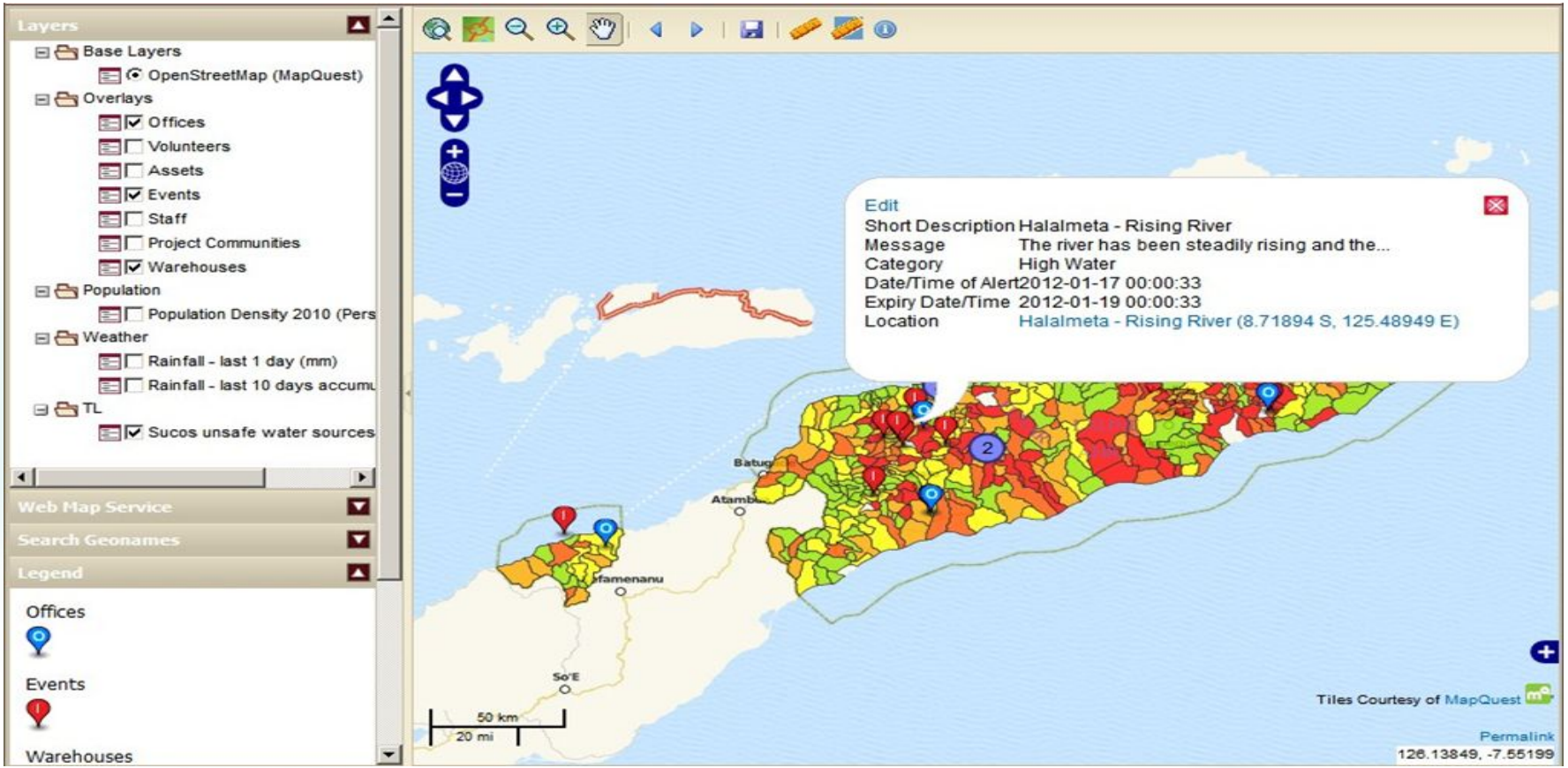
District	Population						Households				
	Total	Male	Female	Sex	Area in	Density	Private				Other
							Total	Male Headed	Female Headed		
TIMOR LESTE	1,066,409	544,198	522,211	104.21	14,954	71.31	184,652	155,118	29,534	1,342	
AINARO	59,175	30,183	28,992	104.11	870	68.03	9,664	8,155	1,509	128	
AINARO	15,558	8,083	7,475	108.13	236	65.94	2,292	1,949	343	108	
Ainaro	6,937	3,640	3,297	110.40	31	225.61	871	702	169	105	
Suro-Craic	1,008	500	508	134.17	28	36.03	182	166	16	1	
Soro	1,861	931	930	100.11	28	65.34	299	247	52	2	
Manutasi	1,784	902	882	112.47	18	95.50	265	227	38	0	
Cassa	2,495	1,267	1,228	103.18	70	35.65	414	368	46	0	
Mau-Ulu	470	246	224	109.82	27	17.20	89	80	9	0	
Mau-Nuno	1,003	517	486	106.38	34	29.78	172	159	13	0	
HATU-BUILICO	11,950	5,978	5,972	100.10	130	92.01	2,058	1,723	335	5	
Mulo	4,274	2,123	2,151	98.11	45	138.34	1,112	910	202	5	
Nuno-Mogue	3,394	1,701	1,693	100.47	33	101.38	582	470	72	0	
Mau-Chiga	2,282	1,154	1,128	102.30	51	44.70	404	343	61	0	
MAUBISSE	22,822	11,388	10,834	103.27	261	84.39	3,604	3,018	586	10	
Maubisse	6,184	3,186	2,998	106.27	22	283.82	974	803	171	8	
Manelobas	1,148	575	573	100.35	8	139.70	186	156	30	0	
Manetu	2,413	1,213	1,200	101.08	20	120.17	362	323	39	1	
Antutu	4,579	2,301	2,278	102.82	47	96.76	767	635	132	0	



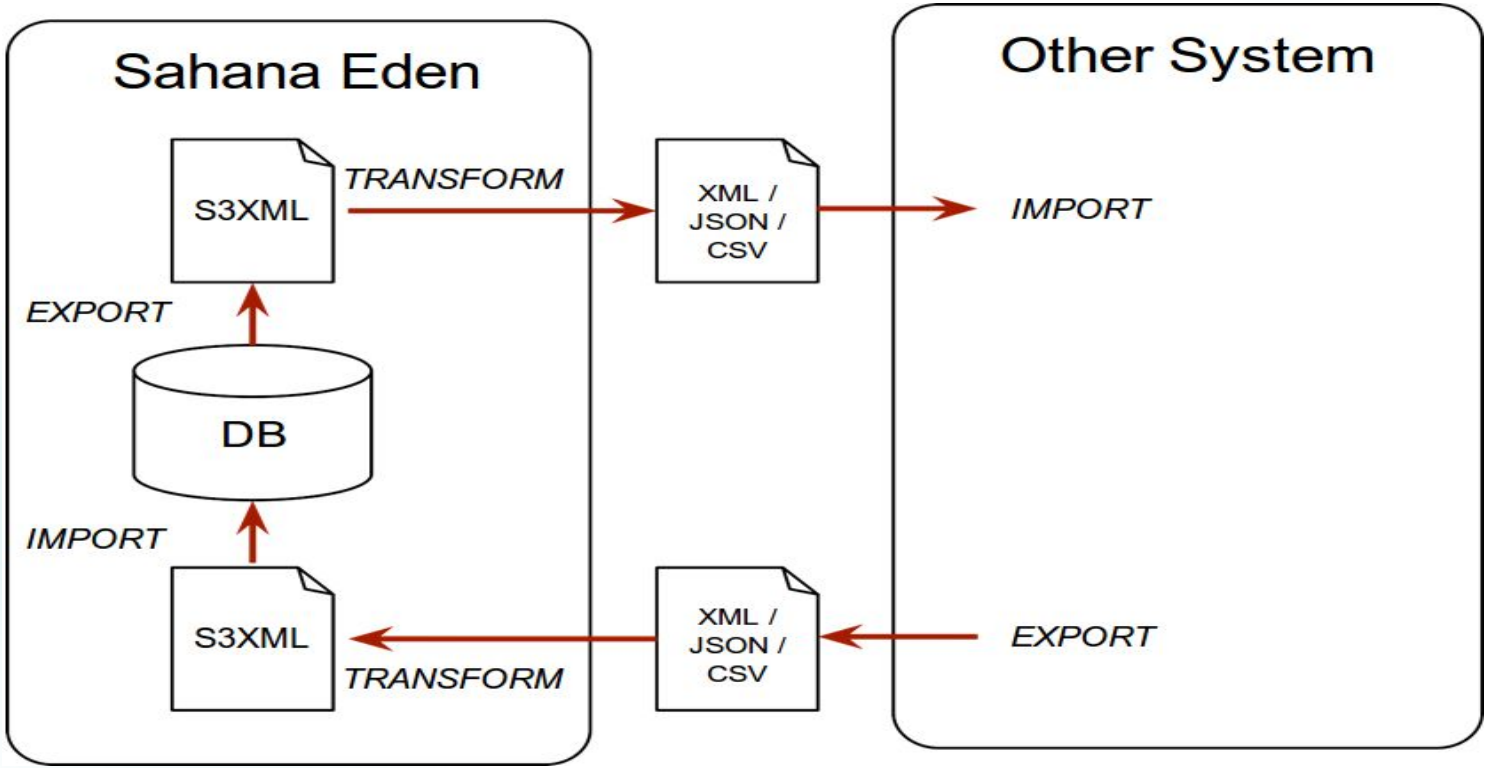




Identifying where the greatest needs are

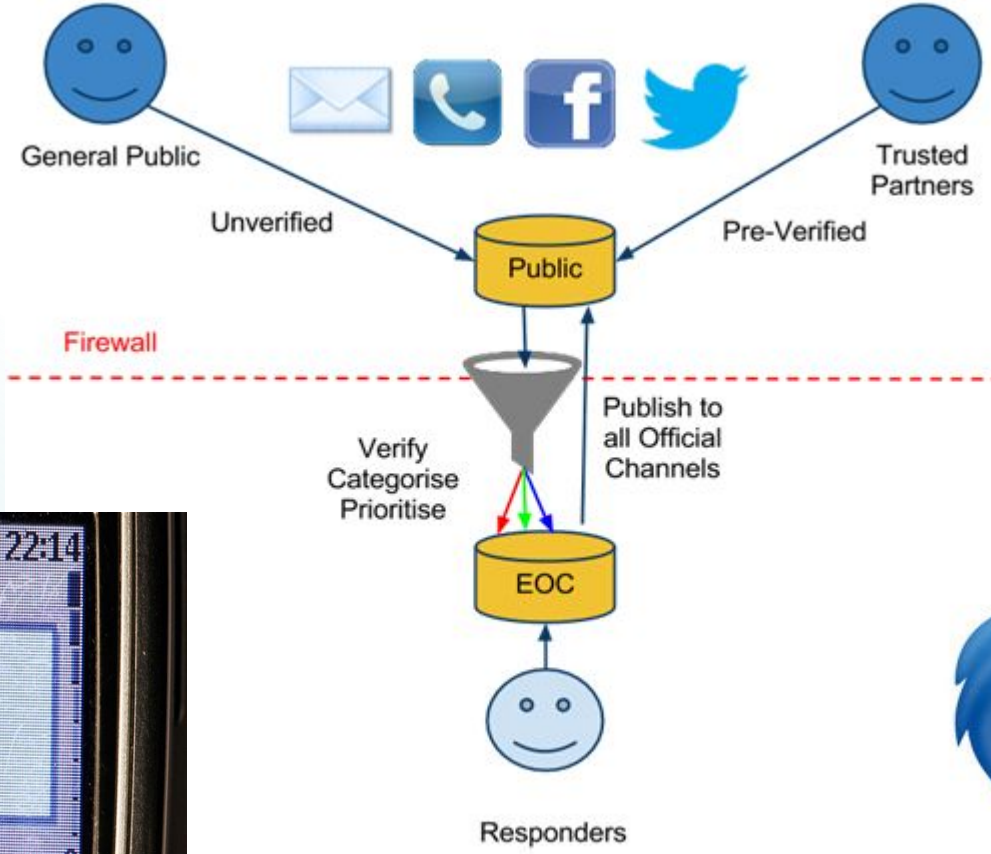


Data Integration

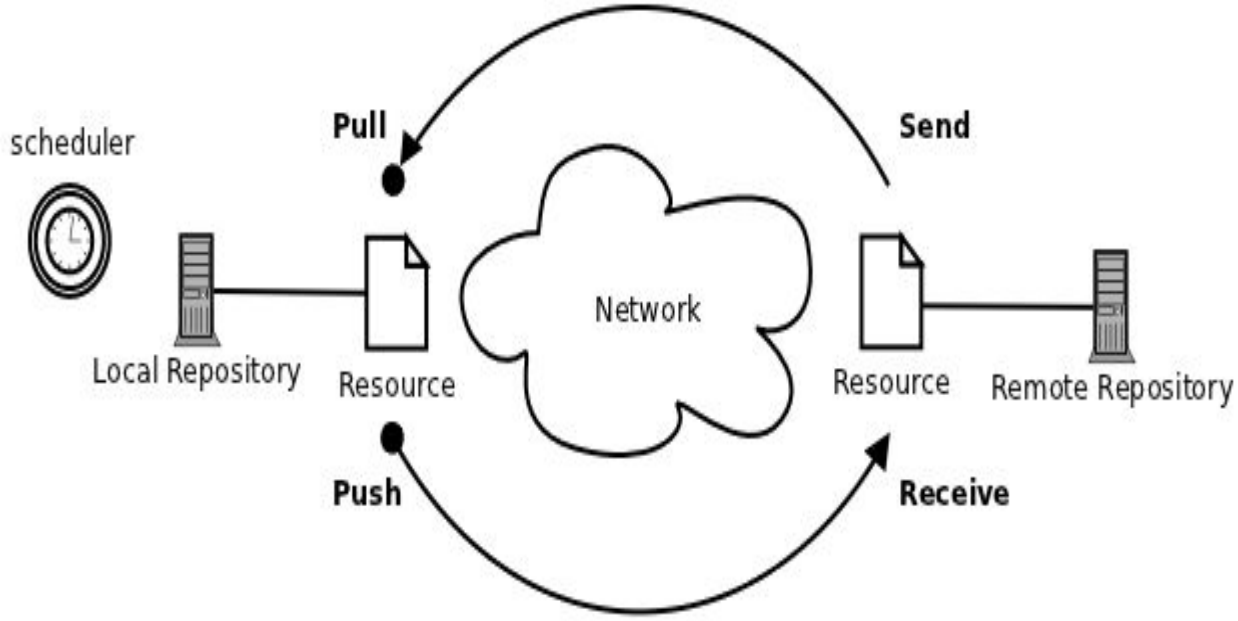


Data import/export to Spreadsheets

Communication and Social Media



Synchronization



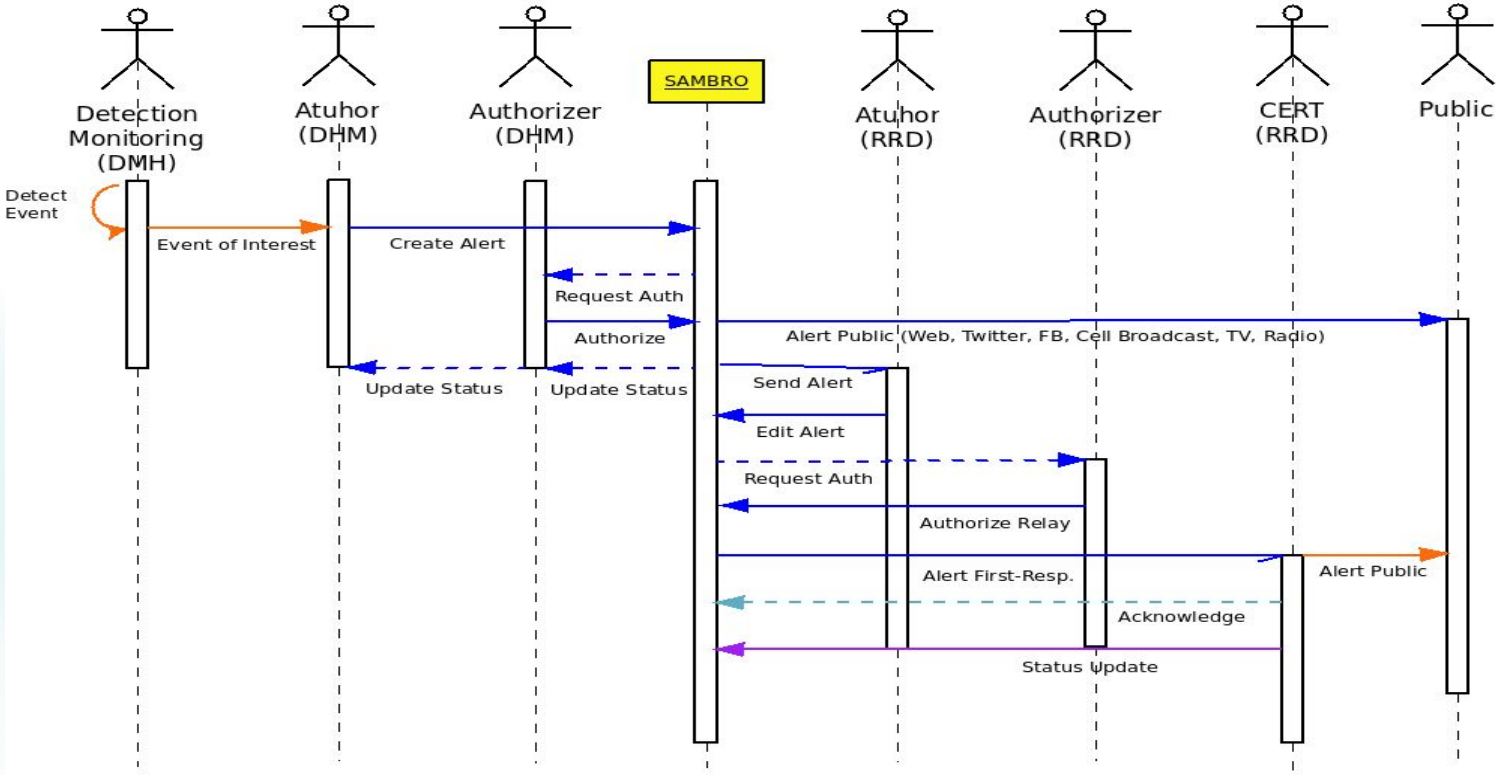
Deployment Options

Host locally in the command center on a Laptop

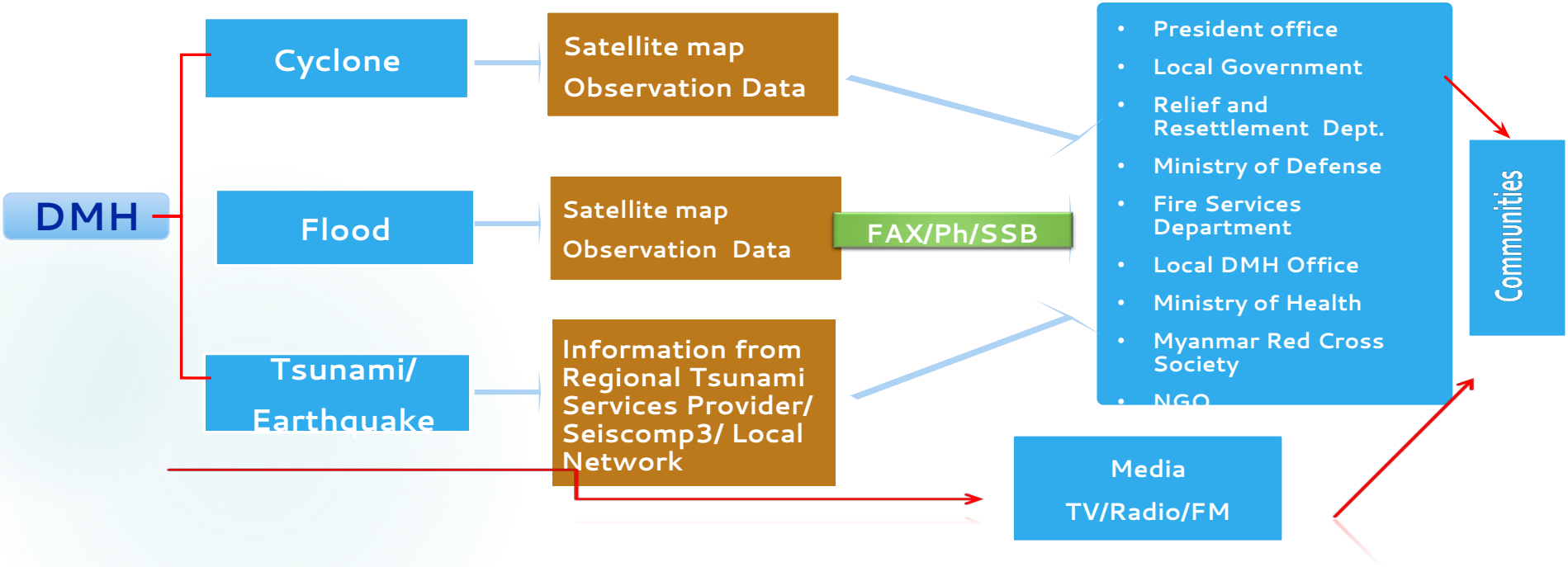
Host in the Cloud

Synchronize these together

SAMBRO Sequence of Operations



Case Study: Flow of Alerts and Early Warnings in Myanmar



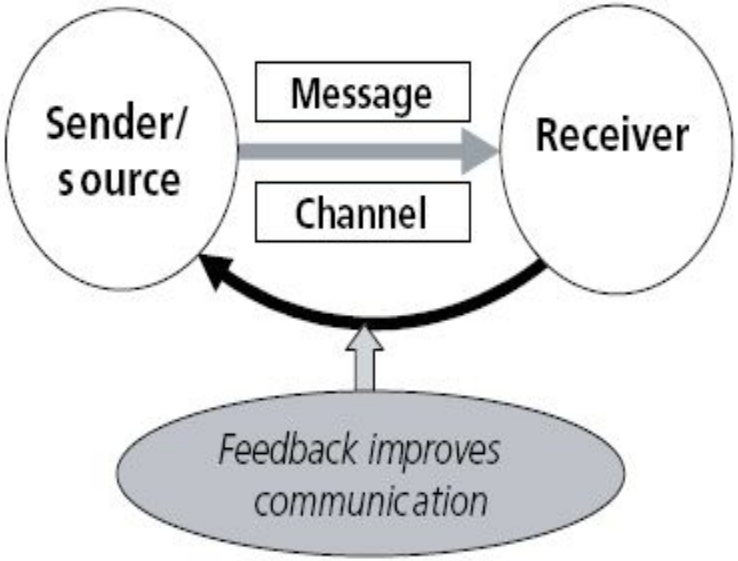
SAMBRO: Alerting and Messaging Broker

Future Goal:
Managing all the phases of disaster

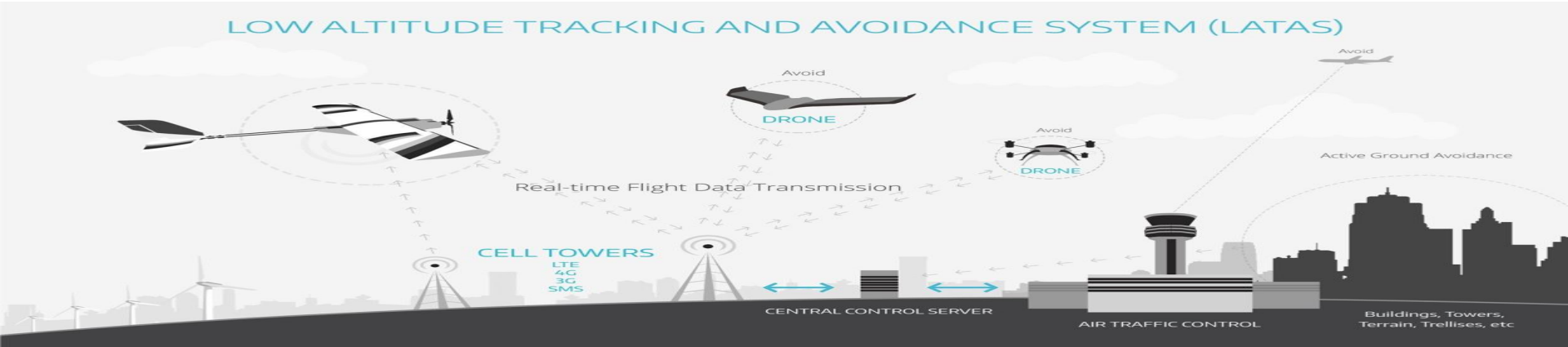
Source : Sahana Demo

Future Development Planning

- **Acknowledgement** and **2 way communication**
- Accomplishment of field based SoP for **situational reporting**
- Rapid Post Disaster Response by the **Drone integration** in the system module
- **Complete disaster management system** - pre-disaster, in-disaster and post-disaster



Drones for Disaster Response and Relief Operations



Thank You