Experience and Challenges in Establishing and Sustained Operation of Laboratories in Tanzania with High Quality Assurance

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Markers for Tanzania

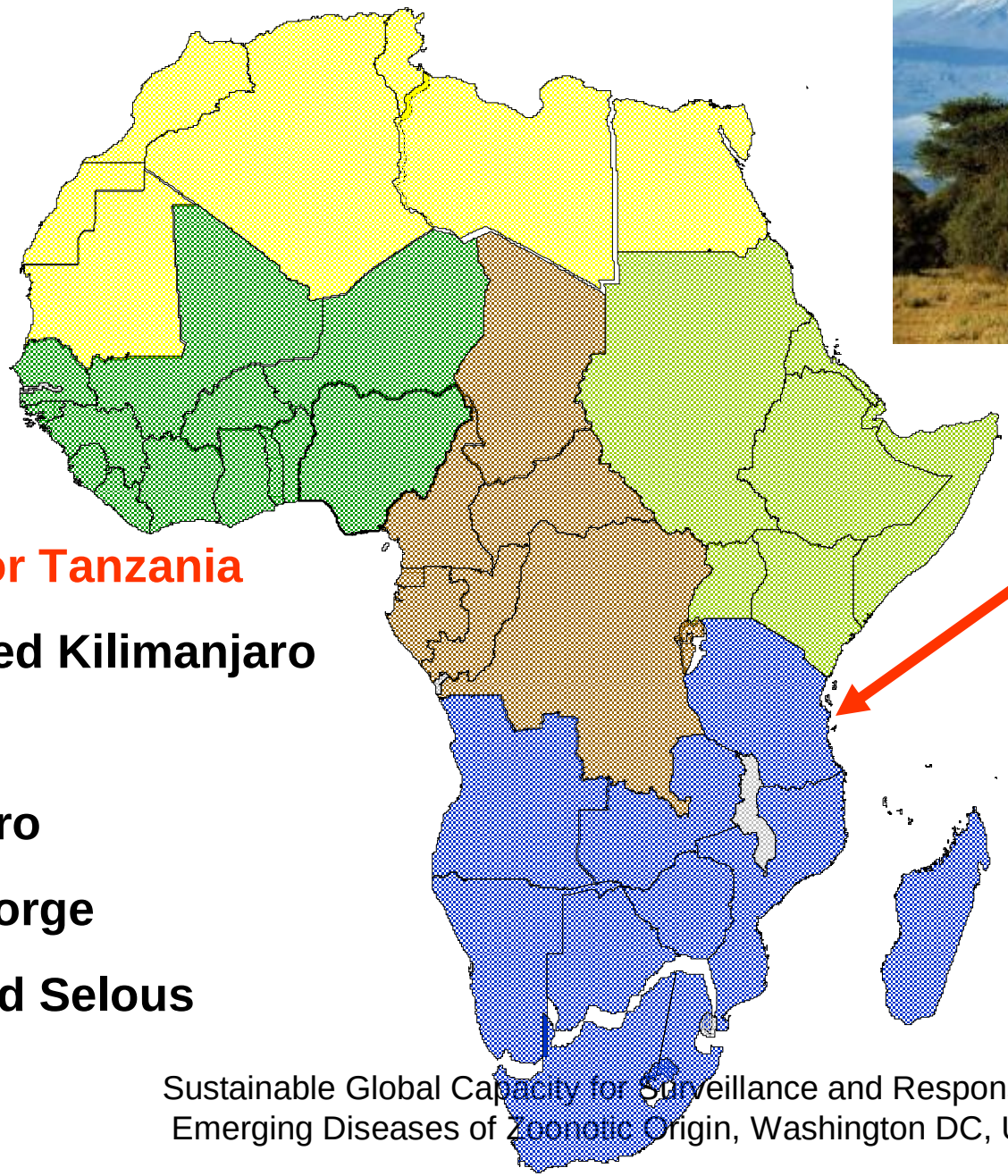
Snow caped Kilimanjaro

Serengeti

Ngorongoro

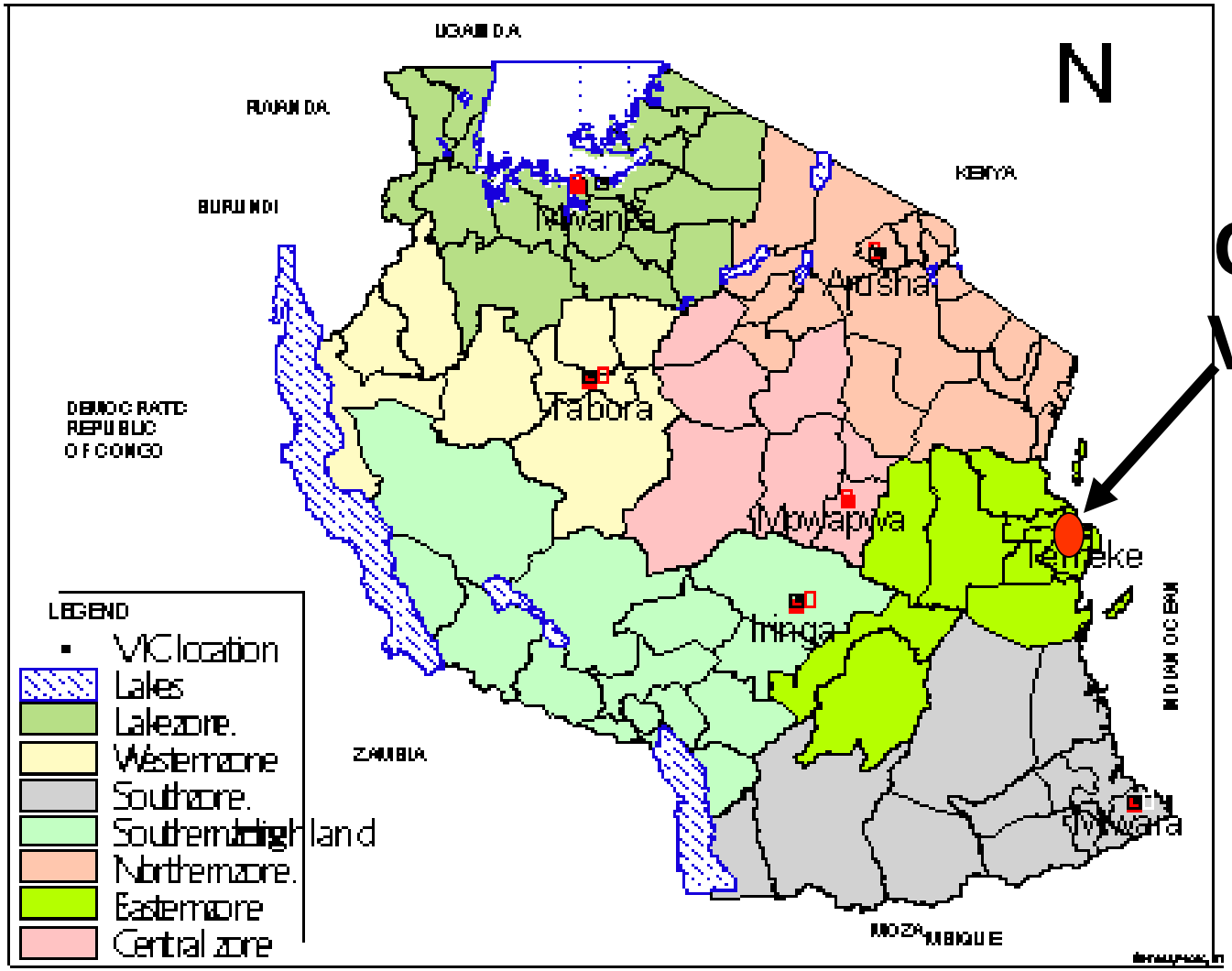
Olduvai Gorge

Mahale and Selous



Tanzania Geographical Position in Africa

Laboratory Networking in Tanzania



Central Vet Lab

Background

- Mandates of Laboratory System
  - Animal health diagnosis, research and training.
- Since early 1900s by the Germans collaborative within Tanzania, regional and world reference laboratories.
- It served as a regional laboratory for TADs Rinderpest was by then the main thrust
- After the fall of the country economy and World bank policies the laboratory system was heavily negatively affected

CVL Laboratory

- Old lab with traditional vet lab structure and department
- The new virology laboratory
- Separate vaccine laboratory
  - I_2 Newcastle Disease (ND),
  - Anthrax, Blackquarter
  - S19 for Brucellosis
  - Haemorrhagic Septicaemia

Importance for Laboratory Capacity in the Context of Emerging Zoonotic Diseases

- Ebola in DR Congo since 1976 vs Tanzania shares boarder
- Ebola in Sudan since 1976
- Marburg in Kenya 1980, Uganda 2007 in Angola
- Yellow fever and Dengue in Kenya, Sudan and Somalia
- RVF in Kenya, Somalia and Tanzania since 1930 especially 1997/98 and 2006/07
- Threat of CCHF in Kenya 2001
- West Nile Disease and Rodent borne VHFs exist in West Africa
- BSE?

Other Infection with Zoonotic Potential Suspected in The Region

- *Bunyamwera virus*
- *Pongola virus*
- *West nile virus*
- *Babanki virus*
- *Semliki forest virus*
- *Sindbis virus*

Arbovirus in Kenya by Barry R. Miller CDC – Nairobi RVF meeting 2008

The challenge is the distribution, prevalence, impact to animal and human health/economy not known? Biology and ecology also not well documented?

Challenge

- The fundamental challenge is establishing capacity for timely detection, identification and typing/characterisation of disease and potential pathogens to support diagnosis, survey, surveillance and research to generate data and information for scientifically based decisions.
  - Disease prevention, control, management, strategy, policy, funding, political, marketing
  - Type of laboratory system and networking

Challenges associated with Zoonoses in Tanzania

- Those known to exist, prevalence not determined (mainly not emerging)
- Factors associated with there presence not well described
- Host populations not well studied and documented
- Diseases mapping not well presented
- Presence or absence of Influenza and VHF a challenge

Challenges

- Biosecurity and Biosafety
  - Access
  - Cooling system
  - Laboratory biosafety equipments and consumables
  - Effluent management
- Laboratory Equipments
- Trained and motivated technical personnel
- Outreach program (sustainable source of samples)
  - Survey and Surveillance
- Sourcing of funds
- Polarism and Paradigm

Challenges Continued

- Govt commitment vs other pending issues
  - Economic growth (alleviation of poverty)
  - Hunger
  - Diseases
  - Education
- Donors and Development partners
  - Limitations of donor country policies and regulations
  - Country verses Donor priorities and recognition of importance

Experiences

- New lab in 1983 planned to be P4
- Construction of building 1983 to 2007
- 2002 – 2004 Word Bank Structure P4/3
- High costs for central cooling system
- 2004 -2007 Govt finalised
- Equipped 20% at P2 level with P3 practices

Collaborations key to Achievement

- **Muguga Laboratory in Kenya, Botswana Vaccine Institute, OVI**
- **VLA in UK,**
- **NVSL –IOWA and University of Minnesota in USA.**
- **FAO and OIE**
- **Output**
  - RP freedom from disease and infection.
  - FMD, PPR, Rabies, ASF, MCF, Nairobi Sheep Disease, LSD, ND, AI, RVF, CBPP, CCPP


Thermo
USAID


BIOHAZARD

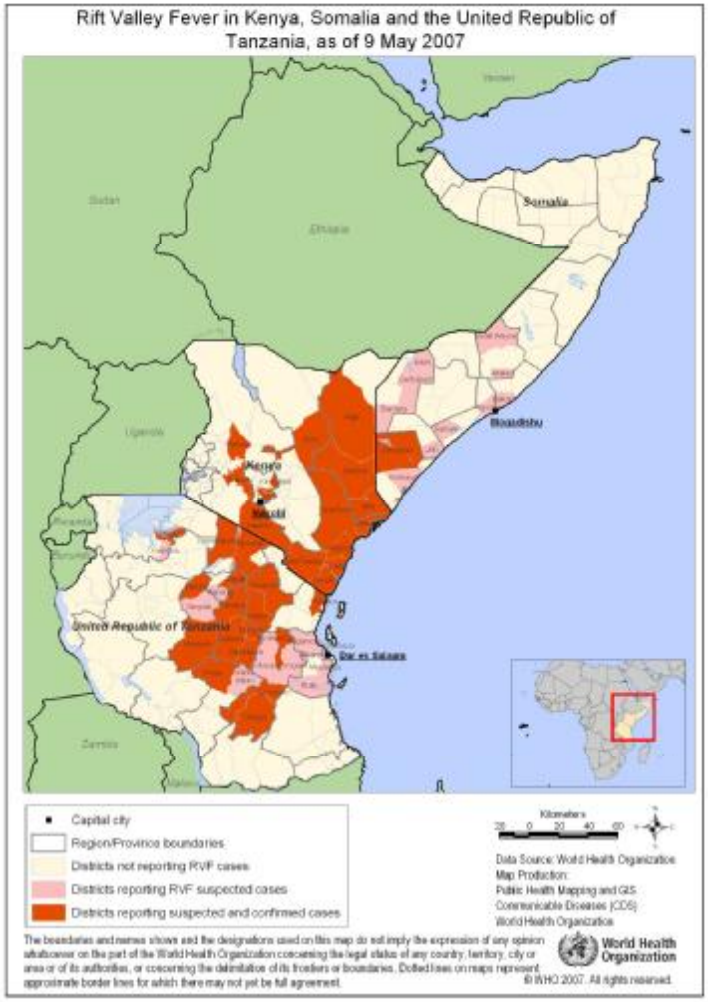
Current Diagnostic Activities CVL

- Diagnosis (serology, DNA based and ECE, mice Virus Isolation)

  RVF, FMD, AI, ASF, PPR, ND, Rabies, RP, CBPP,CCPP, LSD, NSD,

- Training
  - Tanzania staff (Zonal Veterinary Staff) Govt and Donor sponsored FAO, UM, UNICEF
  - Medical, Vet staff USAID and OIE (RVF, AI)
  - Regional: Veterinary and Medical scientists and laboratory staff from SADC (RVF) OIE

Benefits from Capacity Established for AI



The Multisectrol AI team (MoHSW, MLDF, MNRT) switched to RVF technical committee and expanded.

Govt Funds assigned for AHI activities directed to RVF

AGID, PCR and rRTPCR techniques established during AI made it easy to establish RVF detection of RVF, Equipments purchased for AI used for other diseases

Benefits continued

- Reduction of samples submitted to foreign labs (including ref. Labs.)
- Reduction of Risks during handling, transportation and introduction of exotic diseases through labs
- Global back lab systems in place; Wars, conflicts, priority in case of lab country facing a similar disease or thinks at risk

Way Forward

- Support diseases detection, identification (characterisation/typing) and monitoring
- Upgrade the laboratory to P3 level
- Equip to capacitate virus isolation
- Accreditation and Twin with reference laboratory
- Capacitate to undertake diseases and virus survey to enable diseases mapping to support export, tourism and early warning for emerging pathogens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Conclusion

- Establishing and Sustaining a Lab with Quality Assurance is Possible
- The processes can be of short, medium or long term all depends on funding
- Sustainability needs a clear mechanism to be put in place
  - virtual centre involving universities and research institutions
  - long term programs coupled with training components of (MSc, PhD, Research fellows and Post Docs)

Acknowledgement

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- FAO and OIE
- The Institute of Medicine of the National Academies
  - Harvey, Alicia, Brown Sara

ASANTE SANA

(THANK YOU)