Building e-Villages for People's Life

International Workshop
Mon, 7th July 2014
on "e-Village" at MCF Conference Hall,
MICT Park, Hlaing Township, Yangon

Yasuhiko KAWASUMI
Vice Chair of ITU-D SG1 (Rural Communications, etc.),
Advisor to the ITU Association of Japan

Mustang in Nepal

History of Rural Communications Study in ITU

- **Valletta Action Plan (WTDC-98)**

Focus Group on topic 7, "Study of new technologies for rural applications" launched and issued report after one year activities by collecting & analyzing case studies from member countries.

- **ITU-D study question on rural communications development:**

The study started from WTDC-94(Buenos Aires, Argentina),

"Telecommunications/ICTS for rural and remote areas" (2002-06, 2006-2010, 2010-14 study cycles),

Activities include collection and analysis of case studies, country contribution documents, e-forum to exchange information, experiences on policies, regulation, low cost technologies, etc.

ITU-D Studies on Rural Communications

- **Recommends based on the analysis of collected Case Studies :**

1) Provision of telecommunications/ICTs in rural and remote areas in their national development plans,

2) Assess all available technologies in the market taking into consideration the regulatory environment, geographical conditions, climate, costs (capital expenditure and operational expenditure), maintainability, operability, sustainability, etc.,

3) Business models which can achieve financial and operational sustainability can be operated by local entrepreneurs supported by a variety of initiatives. These facilities, where necessary, should also be supported by Universal Service Funds as an essential component of rural communications;

4) that local institutions, such as village committees should be involved in planning and implementing ICT facilities;

ITU-D Recommends: Continued

5) enhancing local technical expertise and adoption are important for successful implementation of ICT services and applications in rural and remote areas,

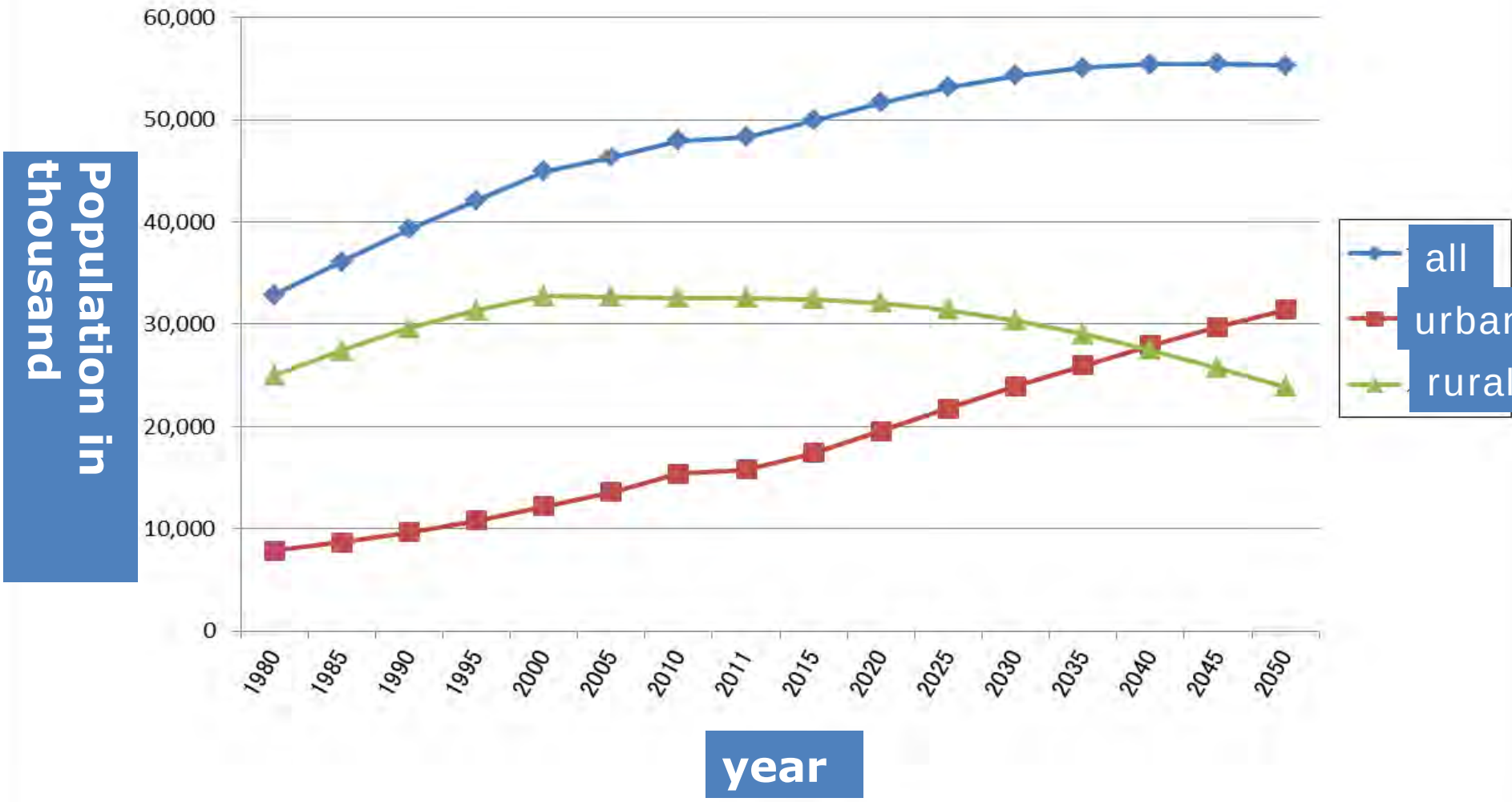
6) migration to broadband technology should be encouraged,

7) take steps to ensure reliability of equipment in rural environments,

8) renewable energy sources should be used whenever feasible taking into consideration the environmental problems,

Myanmar's e-Village project

Population change of Myanmar(urban vs rural)



Needs of national policy and regulatory frameworks on following key elements

- **Special policy, legal and/or regulatory frameworks for infrastructure sharing in rural and remote areas, for example by using optical fiber cables and BTS/microwave towers, backbone networks, etc.**
- **Regulatory and policy measures to accelerate the development of telecommunications/ICTs/broadband in their rural and remote areas**
- **Instruments, such as universal service provisions, universal access funds, license obligations, and targets of broadband coverage, penetration rate and data speed, defined in the telecommunication law and regulation**
- **Access various e-applications, specially those which integrate them into national streams like e-governance, e-health, e-education, e-agriculture, etc. for vitalizing rural community**

Why capital investment for ICT services is called for

1) Can ICT services for rural areas stop the migration of population from rural to urban areas (urbanization),

2) Can ICT services empower the women and marginalized people in rural areas,

3) Can ICT services empower the rural economy,

4) Can ICT services to contribute to preserve the tradition and culture of rural community,

5) Can ICT services improve the child and mother mortality in rural areas,

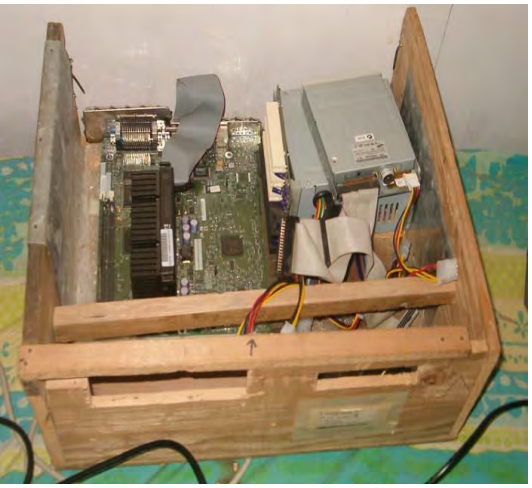
Network Segmentation between core networks and user's premises (Technology option for infrastructure)

- **Long distance transit network (core networks)**
  Thanks to rapid technology progress, the transmission capacity of the backbone trunk line such as terrestrial optical fiber, satellite (LEO,MEO, GEO), optical submarine cable is increasing tremendously.
- **Backhauling segment (middle range: <100Km)**
  Optical fiber (WDM,DWDM, etc.), Wireless (3G, 4G, LTE, WiMAX ,etc.)
- **User access (last mile: <10Km) : Wireless or wired, WiFi, WiMAX, 3G, 4G, LTE, DSL, FTTx, GPON, GEPON, etc.**
- **Multi-media services require last mile broadband data speed in particular for the developing countries (both urban and rural areas).**

e-Applications for Village People's Life

- e-Education
- e-Healthcare
- e-Agriculture
- e-Government (e-administration)
- e-commerce (e-banking)
- Community bulletin board (news services)
- Weather information services
- Disaster alert services
- Services for protection of children and elderly people
- Others

Successful Practices-1
(Nepal Wireless Networks in Mustang)



Computer and Vocational Training Programs

Installation Team Members

Partners and Supporters

1. Mustang District Development Committee, Nepal
2. Himanchal Higher Secondary School, Nepal
3. Open Learning Exchange – Nepal
4. Nepal Research and Education Network, Nepal
5. Om Hospital, Pokhara, Nepal
6. Kathmandu Model Hospital. Bagbazar, Nepal
7. Nepal Medical College, Jorpati, Nepal
8. Thamel.com, Kathmandu, Nepal
9. Gandaki College of Science and Engineering, Nepal
10. Kaski Association of the Blinds, Nepal
11. Japan International ICT Association (JIIA), Tokyo
12. ITU Association of Japan (ITUA-J)
13. KDDI Corporation, Japan

Project Implementation:
Khopra Relay at 3,650m

Wireless Relay Station, Kagbeni

Transport Technology Used

S.N.	Equiment	Number
1	Alvarion radios of different capacity	28
2	5.7 GHz Motorola radio with reflectors	6
3	5 GHZ MikroTik APs and Client radios	18
4	2.4 GHZ EnGenius , and Deliberant	10
5	24dB Directional Antennas	4
6	15 dB Panel Antennas	13
7	14 dB Omni Directional Antennas	3
8	Cisco routers and switches	4
9	Soekris Routers	4

For Backhaul – WiMax Equivalent Equipment

Access Technology Used

- Assembled PCs from different manufacturers
- Laptops Donated by KDDI Corporation Japan
- OLPC laptops implemented by Open Learning Exchange Nepal and Department of Education
- VoIP equipment such as Linksys, Dlink, Polycom
- Network Camera such as Polycom, Logitec and Panasonic BL-C10A camera for telemedicine and tele-training program
- Open source software called VLC for video conferencing

Project Implementation: Power Generation

Solar and Wind Power

Power Storage Batteries at Relay Station

Project Implementation:
Name of the Villages Connected

1. Lete
2. Kobang
3. Tukuche
4. Marpha
5. Syang
6. Jomsom
7. Kagbeni
8. Bhuka
9. Aula
10. Chimkhola
11. Kaphaldanda
12. Torikhet
13. Chimkhola

Project Implementation:
Location of some of the Villages in Mustang

Some of the villages around Jomsom as seen from Dakarjong Relay Station

Project Implementation:
390 OLPC laptops from DOE and OLE-Nepal

Project Implementation:

85 Fujitsu Laptops were donated by KDDI Corporation and ITU Supported for the Shipment from Japan to Nepal

Project Implementation: Local Home Page

Project Implementation
Weather Station at Khopra (3,650m)

Future plan is to build wireless network across Nepal.

Case Studies of Optic Fiber Networks for the Small Island Country (RMI)

Republic of Marshall Islands' Case

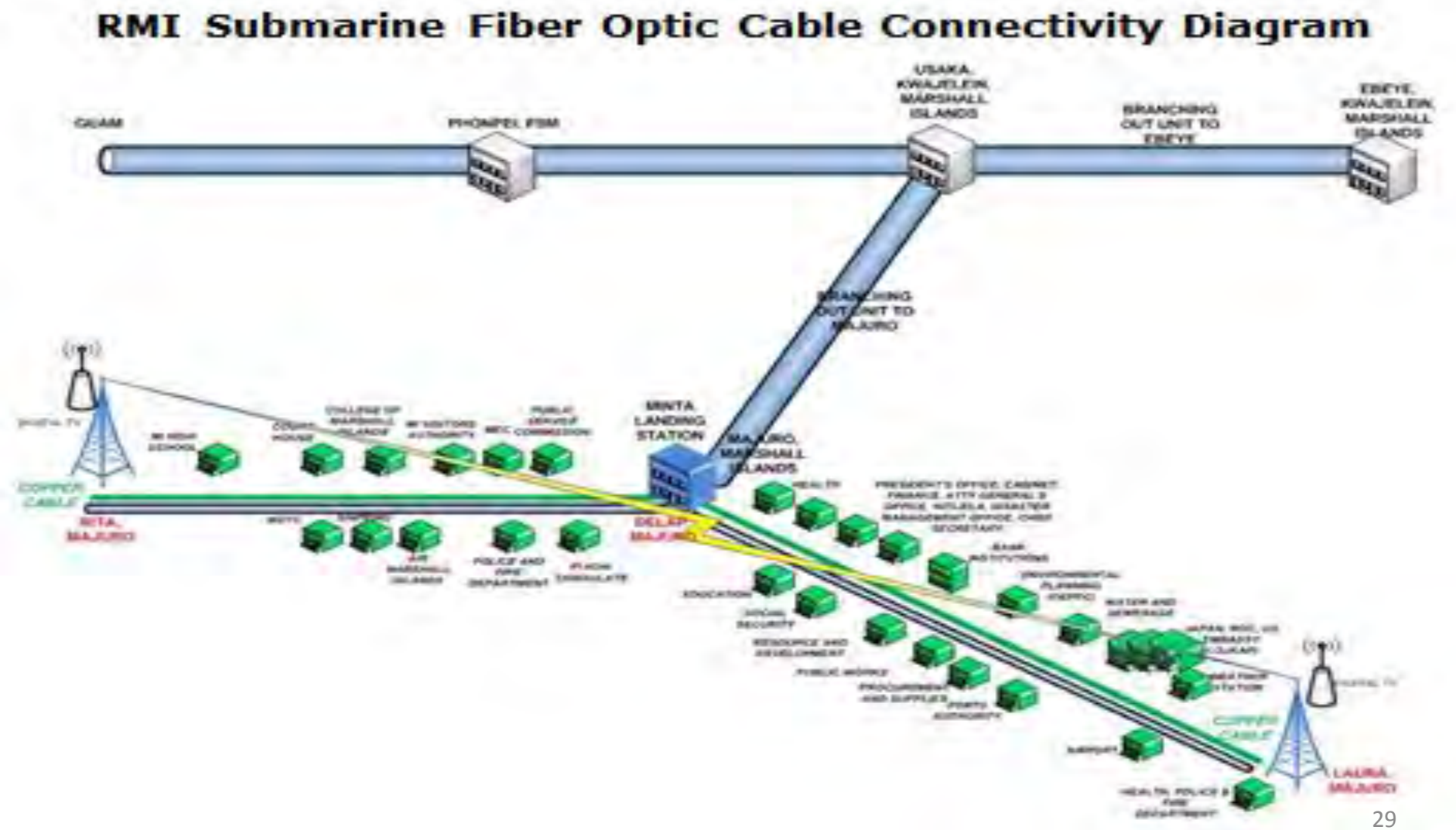
- **The Marshall Islands are located in the North Pacific Ocean some 4,000 kilometers northeast of Australia, consisting of 27 atolls and 5 islands. Land area is approximately 181 square kilometers scattered over 2 million square kilometers of territorial waters. Among the islands and atolls, there are only 4 islands and 22 atolls that are inhabited and Majuro is the capital.**
- **The total population is about 60,000 of which 60% resides on the capital, and 20% on Ebeye/Kwajalein (second urban center). The remaining 20% is scattered over 24 Atolls/Islands.**

RMI's Case (continued-1)

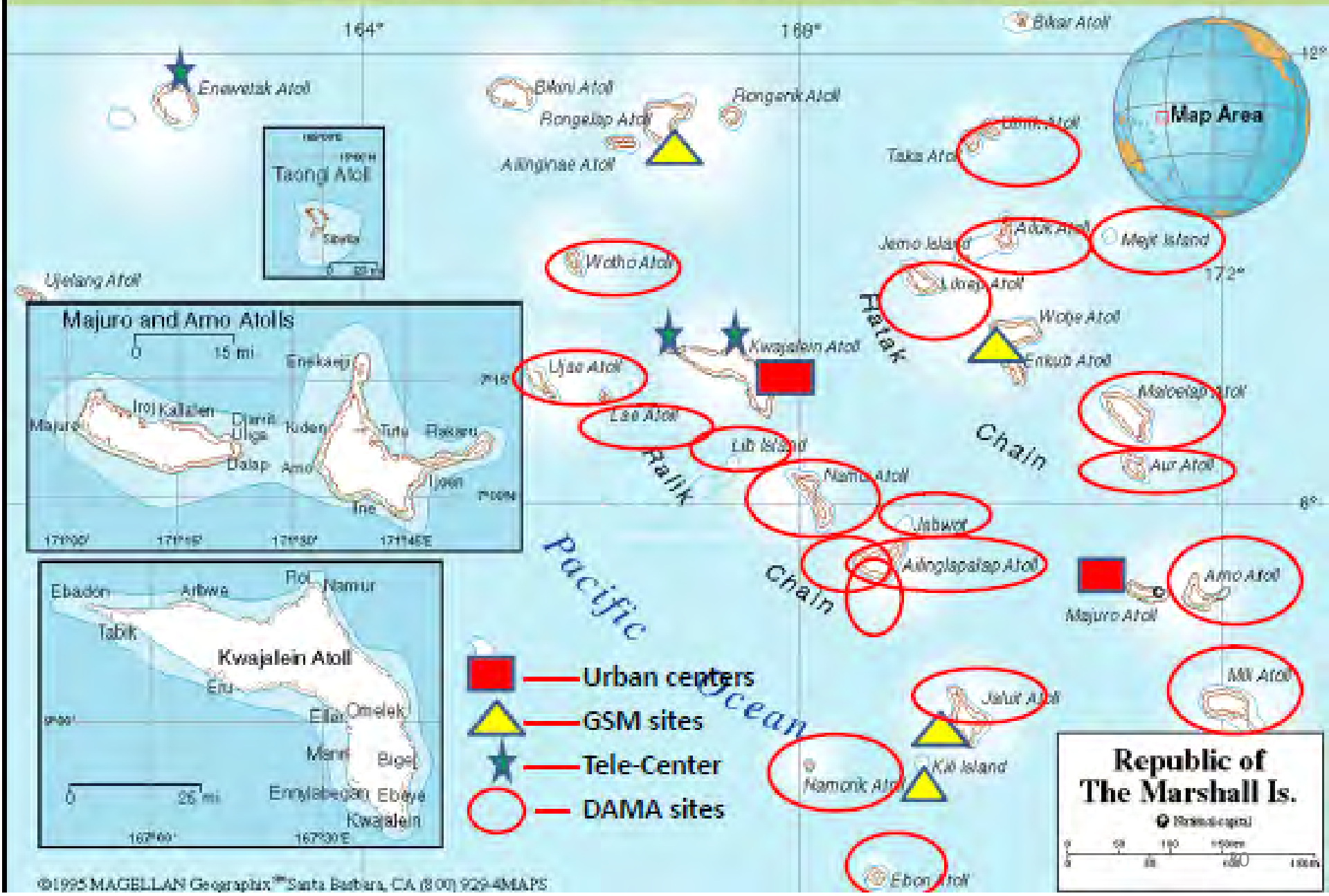
- **Majuro already has underground core optical fiber backbone from Rita to Laura and hand holes every 1,000ft, and 8 nodes along the main road which are connected to MINTA's main building. Optical submarine cable landed Majuro is linked with Guam via Kwajalein and has bandwidth capacity of 10 Gigabits with 70 Gigabits more to be added as demand increases.**
- **The present core backbone is branched and extended now to the limited number of customer's premises by high speed FTTH on the occasion of recent Small Island Countries Forum in Majuro. Instead, low speed ADSLs of 256Kbps are extended to about 1000 customer's premises for collecting the traffic to be put through the Optical Submarine Cable, thus limiting to 1% use of the full capacity of submarine cable just like the small number of cars on the highway.**
- **If the high speed FTTH is extended to customer's premises in Majuro like fishbone network in the very near future the submarine cable will be effectively used so as for MINTA to raise revenue from new emerging services such as VoIP, high speed internet services, digital IPTV, and e-application services.**

RMI's Case (continued-2)

RMI Submarine Fiber Optic Cable connectivity diagram



GSM and Planned DAMA services



Needs of Workshop for training of fiber networks and associated techniques

- General awareness training on optical fiber networks, digital communications and IP networks
- Basic knowledge on FTTX, FTTH to be extended to customer's premises
- Training on fiber splicing techniques, in-house wiring and various necessary equipment and parts
- Training on outside optic fiber installation works
- 25 technicians participated in the two day fiber splicing workshop held last November at the MINTA's (incumbent operator) training room

Case Studies of Optic Fiber Networks for providing various e-applications for smart city

Shiojiri (Japan) case

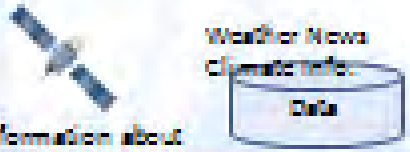
- Optical fiber networks are built which connect 72 points（Schools, City administrative branches, Hospitals, Museums, Nursing facilities, Kinder gardens, Industrial parks, etc.). Total length is 130 km. Public WiFi spots are interconnected. Fiber networks are built by government subsidy, however operated by city council with their own budget.
- Disaster mitigation systems are built deploying various sensors over the power saving Ad hoc wireless networks with 640 relay stations (debris flow, land slide warning, water level warnings, harmful bird and wild animal info., bus operation info., and children watch info.)
- City established Shiojiri Internet Connection Organization (Japan's first municipal provider with over 10,000 users) with open net concept. (because of private ISP's usage charge was costly)

Information on Spatiotemporal Platform

Various Sensors and Internet

Information about Weather, Crime Prevention, Disaster Prevention, Policies, Sightseeing, History, Culture, Agriculture, Health and Welfare

Ad hoc Network + Optical Fiber Network + Internet



Big Data
Open Data

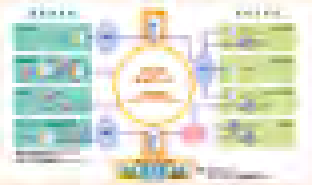
Central Management by Cloud System

Wifi
Internet Connection

Information Sharing with Citizens


Smart Phone


Cellphone and Email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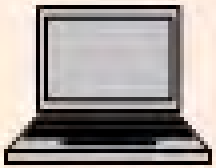
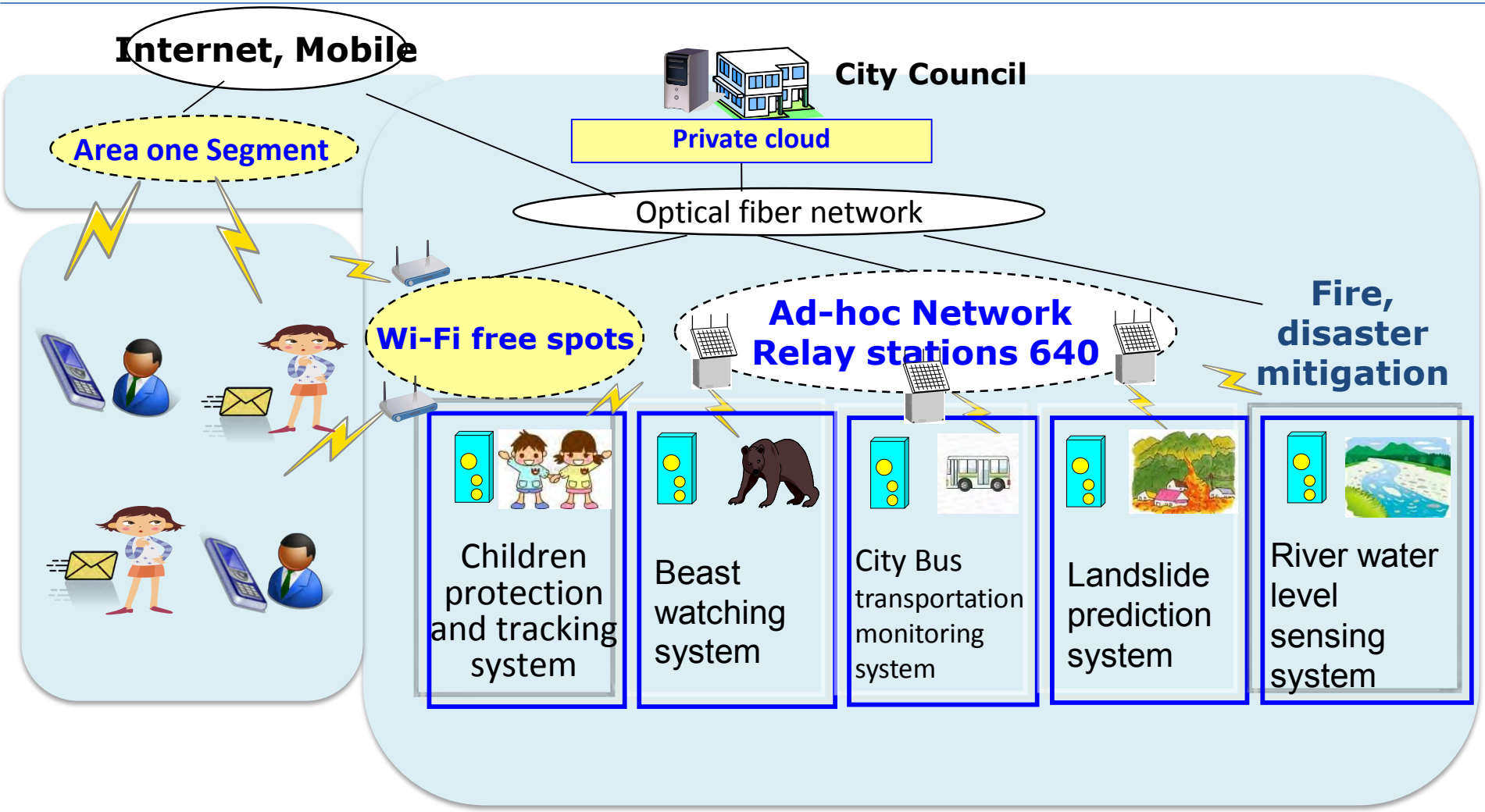

Computer

Disaster mitigation system



Lessons learned from case studies for building "e-Village"

- Subsidies from government, USF, outside funds etc. are required for start-up of "e-village",
- Community participation for building "e-village" and operation and maintenance is essential,
- Public private partnership (PPP) should also be sought for raising fund,
- Outside expert knowledge and experiences should be fully utilized for system design, e-application & software development,
- Solution for power supply is bottle neck for ICTs in rural areas,
- Human resource development for local staff is always most important issue for O&M and sustainability of "e-village".
- E-education, e-healthcare, e-agriculture, e-commerce(e-banking & money remittance service) are key applications in rural areas

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Thank you !!

Yasuhiko KAWASUMI
ITU-D SG2 Vice-chair,
Advisor to the ITU Association of Japan