Addressable Radios for Emergency Alert (AREA):

A WorldSpace offering for effective delivery of alerts

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Alert Delivery: Wish List

- Can it cover 100+ countries with one secure uplink?
- Can it be addressed by country, group, tier or even the current location of the receiver?
- Can it be delivered with a latency of less than 10 secs?
- Can it automatically trigger a siren/alarm even if receiver not under use?
- Can the receiver display text and also automatically switch to audio information in a local language(s)?
- Can it cater to diverse requirements/infrastructure ranging all the way from a sophisticated weather office, down to a fisherman out at sea?
- Can it go beyond conventional modes of communication and supplement/complement other technologies?.
- Can it survive even under most hazardous conditions & power failures?
- Can it be re-used for the daily requirements of the community (entertainment, agriculture, health, training etc)?
- Will it be economical when there is a scattered population?
- Is the system tested and ready to be deployed TODAY?

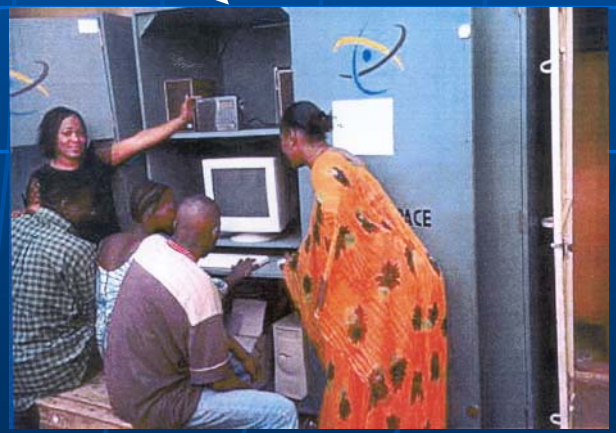
WorldSpace: a snapshot

Wide Coverage

Solar Powered

Transmission to Audio Receivers

Creating a Digital Library

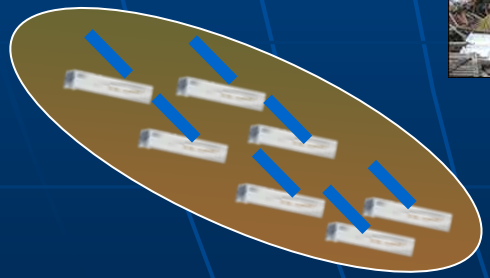


Emergency Situations

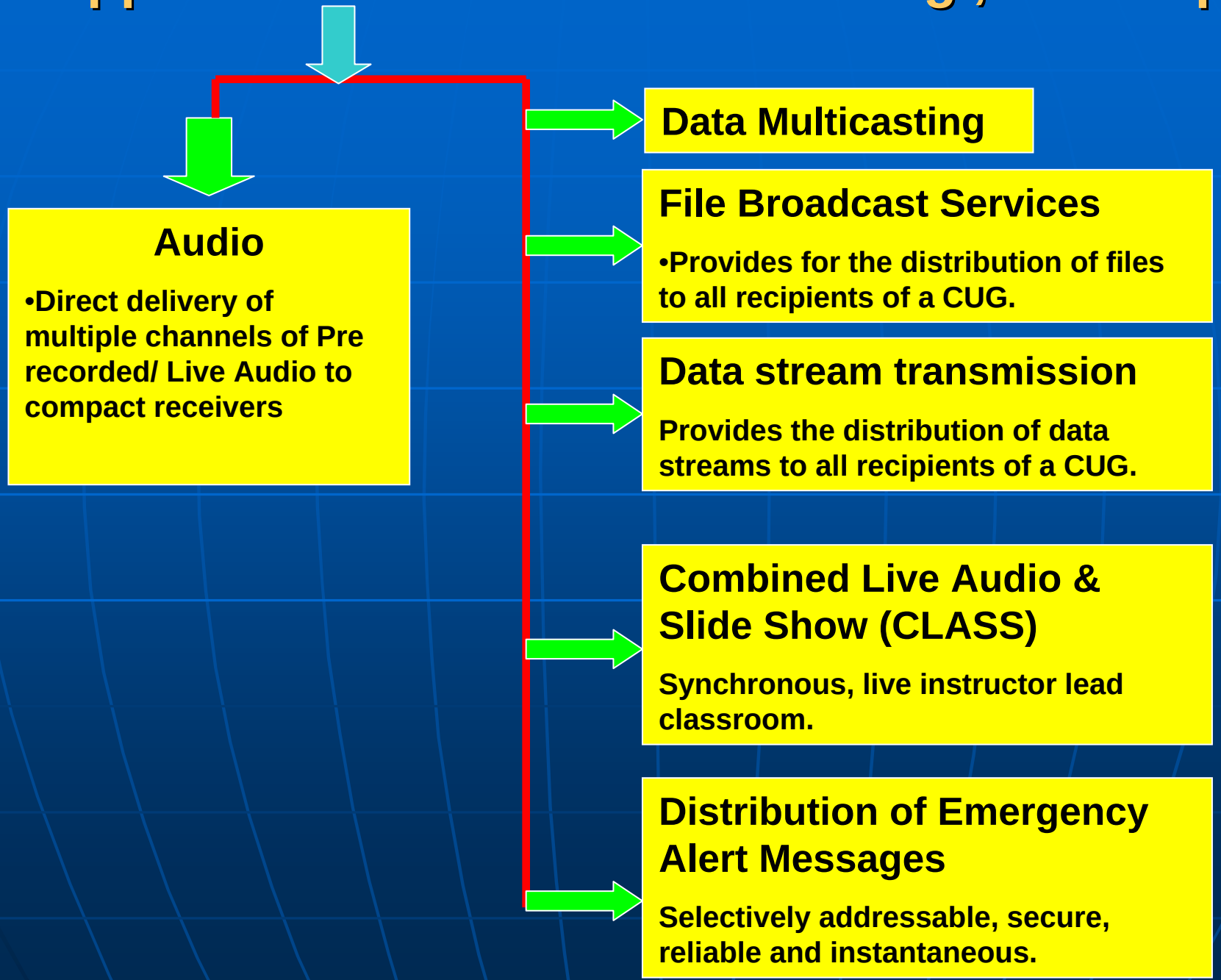
Individual

Village Classroom

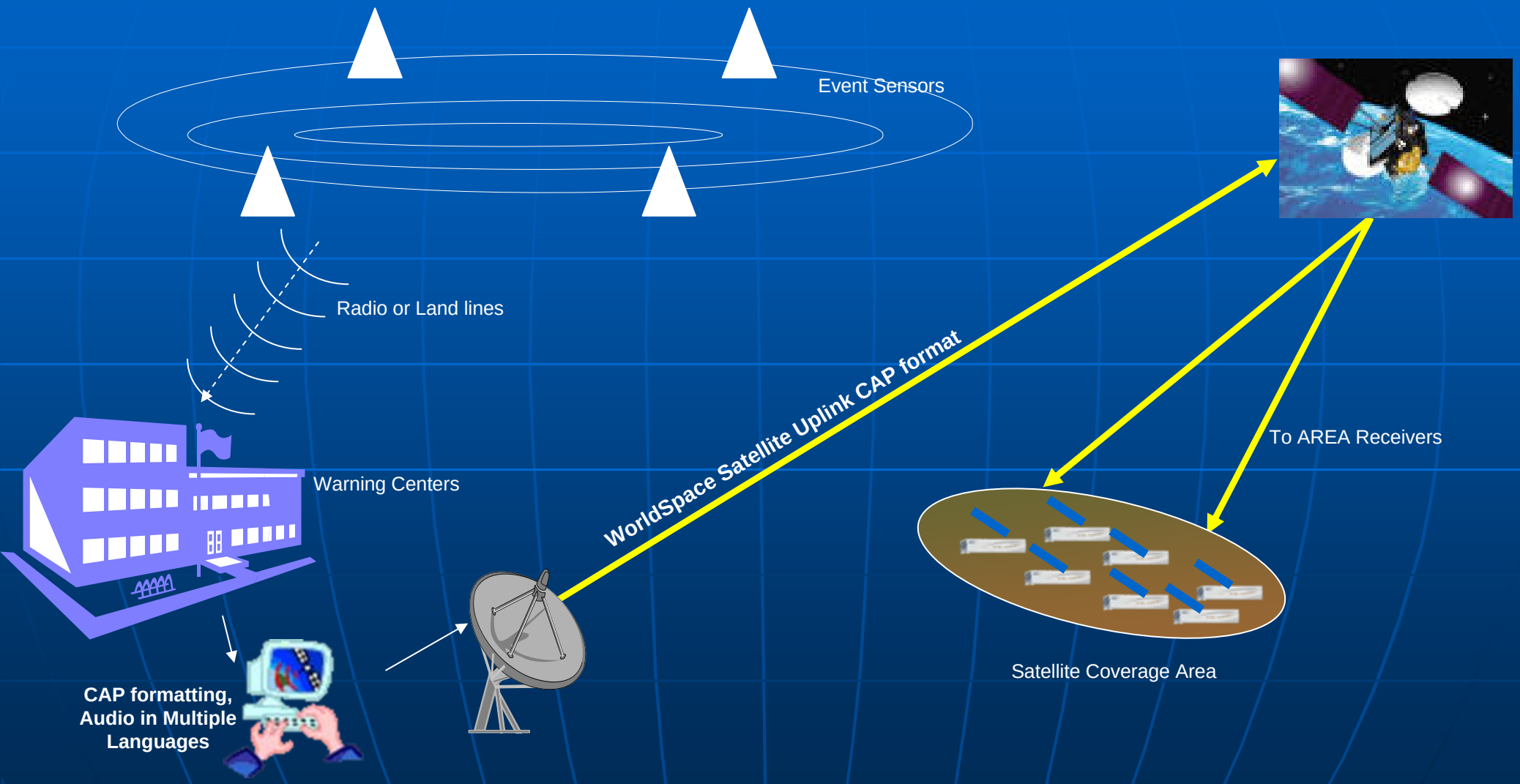
Selectively Addressable Automatic Alerts



Applications of a DAB satellite: e.g., WorldSpace



All Hazard Warning via WorldSpace Satellite



Highly reliable and proven satellite based system

Disaster Alert Delivery - WorldSpace Solution

- Alert signal generated by national & international agencies.
- Adoption of CAP (Common Alert Protocol) 1.1 format.
- Signal uploaded by authorized agency using a secure web interface to WorldSpace uplink server.
- Message as IP data into WS channel, addressed by group or tier or geographical location.
- Specially designed WS radio (AREA) all the time looking for an alert message.

Normal Radio transforms to Special Disaster Radio automatically as needed

Disaster Alert Delivery - WorldSpace Solution contd…

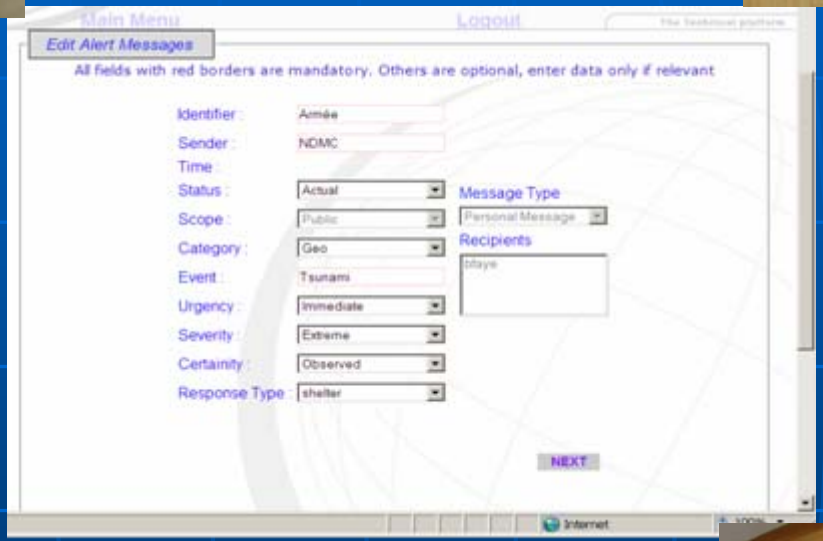
- When message arrives, AREA ceases to be a normal WorldSpace radio, authenticates the alert and displays the alert parameters.
- Disaster radio channel automatically initiated to provide specific information in local languages.
- AREA connects to an external box via USB to provide
  - More extensive display
  - Operate a relay to trigger a siren when the alert arrives
  - Interface with a GPS receiver for geo-referencing of the alert.

WS Radio will perform all the above functions whether the radio is being used or not.

Addressable Radio for Emergency Alert

AREA-B

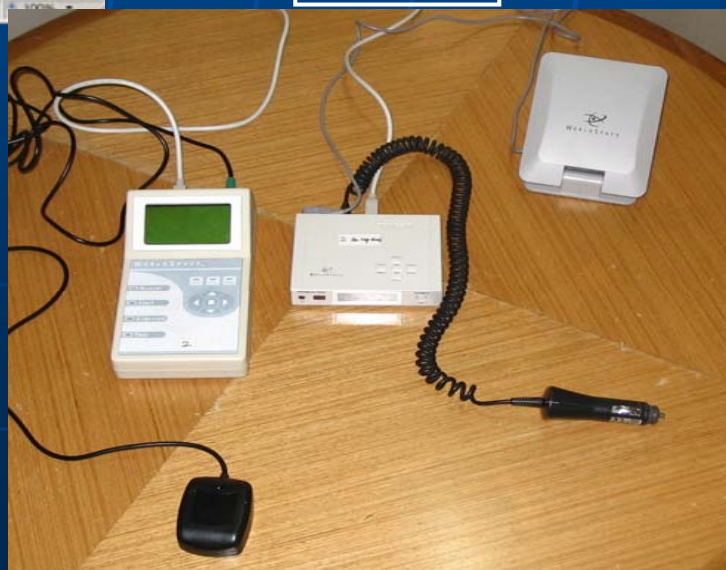
AREA-A



AREA-C

AREA-M

Alert Generation



Different configurations to suit different needs

AREA-A

- AREA-A is a configuration that connects to the USB port of a computer.
- Supports all audio and data services of WorldSpace.
- Onset of alert is indicated by a computer generated siren.
- Displays all the alert parameters (mandatory & optional).
- Can support audio/data download even during the alert state.
- Can support text-to-speech for the alert description.

Ideal for Airports, Harbors, NGO's & First Responders

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AREA-C

- AREA-C is ideal for community deployment.
- Immunity to loss of mains power at the time of the alert.
  - 7 AH battery can be recharged by mains or Solar.
- External siren controlled by a relay
- Can be connected to Public Address system.
- Additional box displays all the alert parameters.
- Radio plays the remotely selected audio channel that carries authentic information.

Ideal for remote locations, beaches, Community Centers & Worship places

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AREA-M

- AREA-M is meant for mobile users.
- Through the external box a GPS receiver is connected.
- The box displays the current location of the receiver before the onset of alert.
- The alert is triggered only if the current location of the receiver is within the alert zone defined by the sender.
- Can be powered by the vehicle power supply and it does not use the external battery and siren.
- Ideal for the travelers on land and sea.

Ideal for trucks, ships, boats & vessels

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Integration & Co-existence of Multiple Technologies

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DAB complementing FM radios

- A very large number of transmitters needed.
- They must be deployed, manned and maintained.
- More vulnerability to hazardous conditions.
- The information must be backhauled into each and every transmitter.
- FM radio cannot have wake-up or other digital technology features like addressability.
- DAB can provide the feed for the community FM transmitter (e.g. COLME project).

FM radio usable in places where there is already a coverage.

AREA, on the other hand, is ideal for direct digital delivery covering remote and vast areas.

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DAB complementing Internet

- Type of Connectivity is point to point.
- Bandwidth not guaranteed at the time of greatest need.
- Time to download can vary.
- Depends on telecom infrastructure available.
- Problems in handling large files.
- Problems in handling streaming data.
- Initial costs, usage and connectivity charges increase with network size.

Internet usable in places where the telecom infrastructure is well-developed and the network is small to medium.

AREA, on the other hand, is the best for very large networks covering remote areas.

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DAB complementing conventional communication satellites (C, Ku, Ka bands)

- Two-way communication of large bandwidths.
- Fixed cost per site significantly higher.
- Infrastructure requirements higher.
- Installation, Maintenance issues.
- More demanding in pointing to the satellite.
- More prone to rain attenuation.
- AREA receive system simpler & cheaper.

VSAT's good for small Closed User Groups with large data requirements,

DAB better for delivery to a large number of sites

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DAB complementing Cell phones for Hazard Warning

- Individual & Location-specific Alerts.
- Audio in an appropriate language.
- Take advantage of rapid expansion.
- Remote areas not covered adequately.
- Base Station vulnerable during hazard.
- System overloads during disaster.
- AREA can deployed to fill in gaps of cellular coverage and for community alerts.

Excellent vehicle when the link exists. Needs supplementing with a satellite system with wider coverage and less vulnerability to hazardous conditions

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Sri Lanka Pilot Study

- One year Pilot Project ended March 2007.
- Community-based last mile Warning.
- 56 AREA receivers including 32 villages
- AREA adjudged most effective & reliable among 5 different technologies {*mobile phones, fixed CDMA, VSAT, AREA & Community Alarm Device*}.
- Implementation in 1000 villages recommended.

Independent & Extended third party Evaluation.
All recommendations being implemented.

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Advantage: AREA

- Scalability
  - Coverage already exists and so easy to roll out services.
  - Being a broadcast service, cost per site decreases as the network grows.
  - Possibility of expanding to other geographical areas.
  - Possibility of expanding to multiple sectors, like education or health.
- Sustainability
  - Does not require technical expertise to install, operate or maintain.
  - Can be configured even in places with poor or no Electric mains supply.
  - Would survive adverse environmental conditions.
  - Independent of terrestrial, telecom and Internet availability.
- Affordability
  - Lower initial cost than any other satellite-based system.
  - Lower recurrent costs.
  - Cost can be spread across multiple projects as the system can be reused.