



## Nokia Siemens Networks Rural BroadBand Solution

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## Summary

- Internet is attractive new revenue stream for operators
- Rural Broadband is untapped market
  - No fixed infrastructure
- Rural Broadband needs to be cost efficient
  - One BTS
  - Low power consumption
  - Good RF coverage
  - “Always on” connection
- GSM meets all requirements
  - Same BTS for voice and Internet
  - Ultra low power consumption
  - IP based network removes Abis bottleneck
  - Down Link Dual Carriers (DLDC) with Orthogonal Sub Channel (OSC)– doubles BTS capacity

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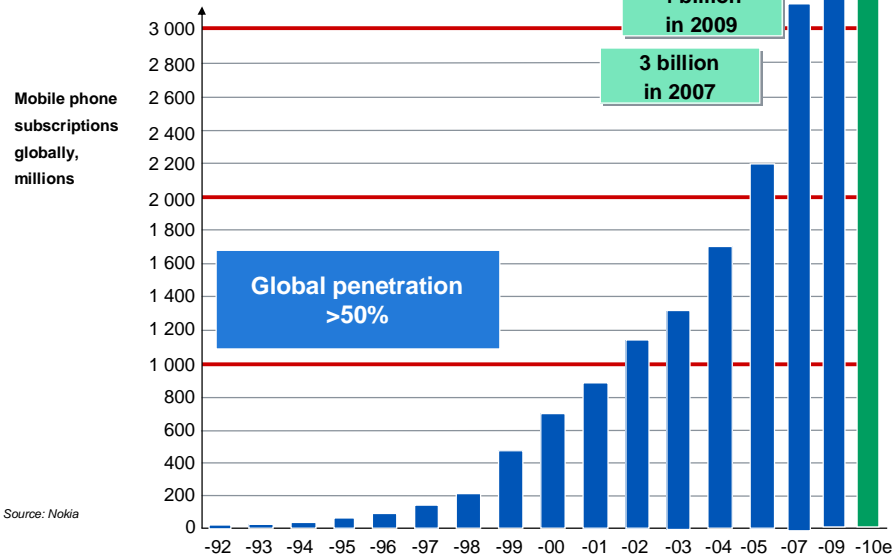
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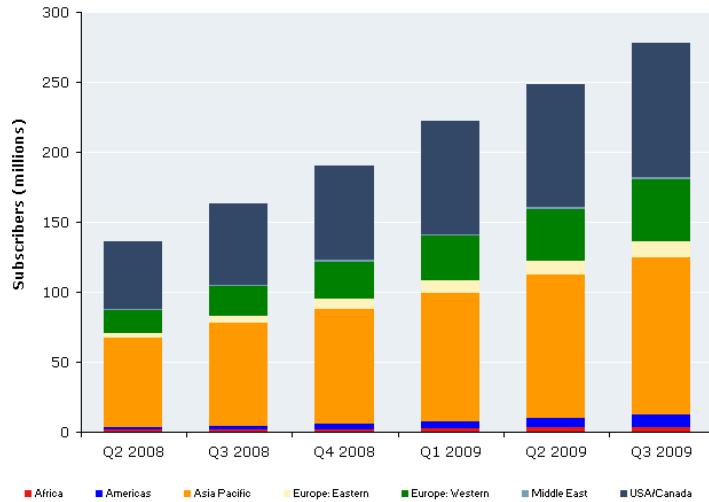


# Market

## Towards the 5 Billion Milestone



## Mobile Broadband Subscribers by Region



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Source; WCIS



An increase of  
10 mobile phones per 100 people  
**0.8% growth in GDP**

An increase of  
10 broadband users per 100 people  
**1.4% growth in GDP**

Source; Nokia

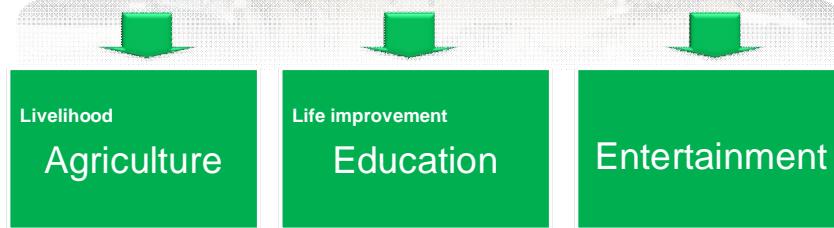
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## Livelihood and Life Improvement Services are Highly Relevant; Entertainment has the Widest Appeal



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## China

- 333 cities
- 2,862 counties
- 37,000 towns
- 690, 000 administrative villages
  - 740 million rural residents
  - agriculture sector contributes to 11.7% of GDP
  - farmer's per capita annual disposable income is 3589 Yuan RMB in 2006
- Fixed phone penetration in rural is 64,1%
- Mobile phone penetration in rural is 62,1%
- The development of **Internet** in urban area still has much difference from that in rural area. The penetration rate in urban market is 27.3% according to official data but it is only **7.1%** in rural market; in addition, the development of Internet source of information in rural market is still weak.

Source; January 2009 CRC-Pinnacle Consulting Co., Ltd

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## India

- 24 languages
- 1642 dialects
- 638,691 villages
- 5164 towns
  - 70% of the population is in rural areas
  - 52% of the population is engaged in agriculture and allied activities
  - Agriculture accounts for 18% of national income
- Total Telephone subscriber base: 479.04 million
  - Wireless subscribers: 441.66 million
  - Wireline subscribers: 37.41 million
- **Broadband subscribers: 6.80 million**
- 10-12 million wireless subscribers added every month

Source: 29.9.2009 Ambika Oberoi / Finpro India

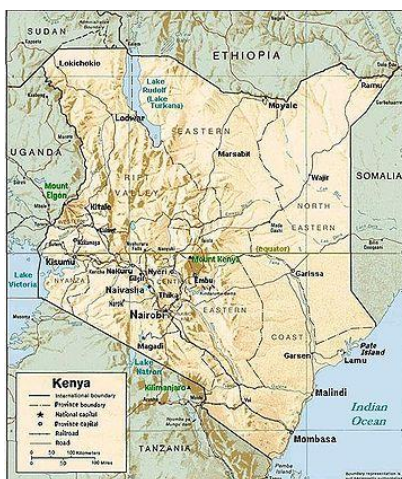
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## Kenya



Population 39 million

- Rural population 19 million
- GDP: \$ 30 billion (2008)
- 24% of GDP from agriculture
- Mobile penetration: 40%
- Fixed lines ~250 000 (-08)
- 3.4 million Internet users

Source: UNData/ITU

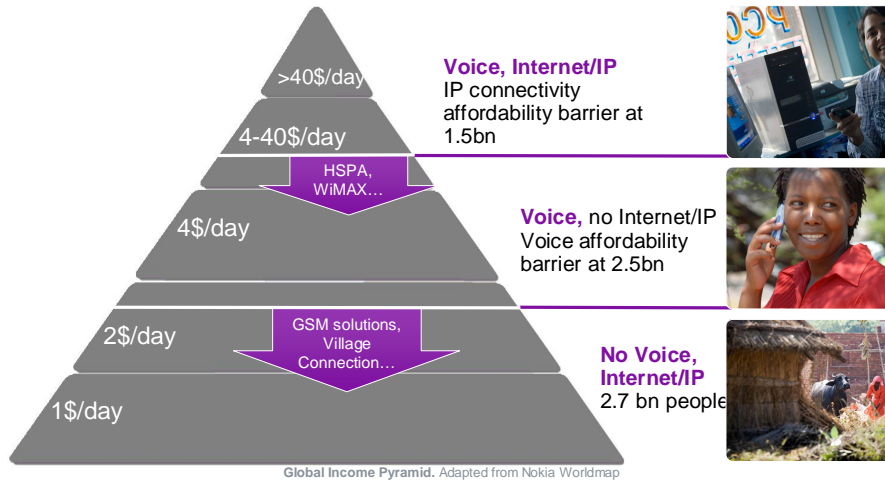
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## Affordability is the key reaching the next billion mobile consumers



## Technical Challenges / Opportunities Rural Mobile Broadband in Emerging Markets



### Low ARPU vs high TCO

Rural ARPU is 1-3 USD/ month but site TCO can be high

### Challenges with networks

#### Tower:

Civil Works (incl. towers/ shelters) dominate the site cost

#### Power:

Unreliable or no power grid, high OPEX of running diesel gen. sets

#### Backhaul:

Lacking or costly transmission networks

### Challenges with mobile devices

#### Radio quality and coverage

Good RF coverage is needed for advanced voice capacity features.

#### Power:

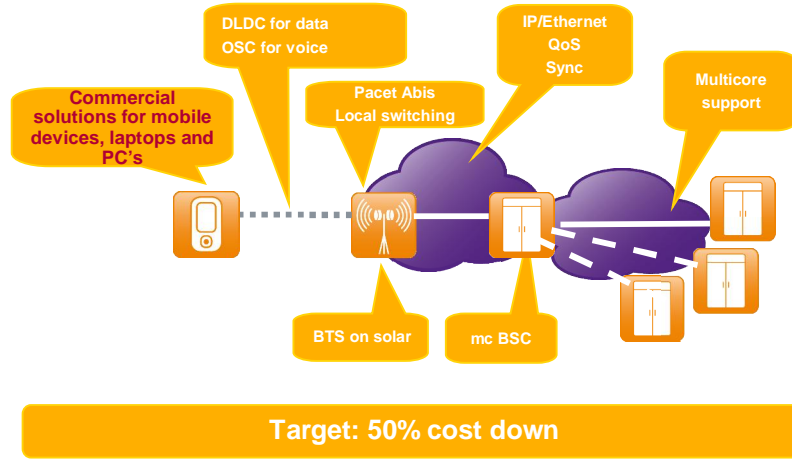
Unreliable or no power grid, electricity available only if needed also for other purposes e.g. refrigerators and lights

# Solution

## NSN Rural Mobile Broadband solution

- **Rural Broadband Solution**
  - Every solution component to be 50% lower cost than GSM/EDGE today
  - Evolution of existing radio networks – only GSM/EDGE radio networks available
  - Commercial solution to areas we cannot build mobile broadband with existing cost structure.
  - Significant improvement in voice capacity
- **Minimum Configuration**
  - 24 voice channels with OSC 6 timeslots (AMR HR with SAIC)
  - 2x256 kBits/s with DLDC in good RF coverage with 9 timeslots
- **Market**
  - End users with very limited purchasing power in rural communities
  - Regions with limited or non existing infrastructure (power grid, transport lines)
  - Fixed broadband not planned for next coming years or existing from 64 - 256 kbps
  - Improved voice capacity at the same time together when introducing broadband

## Rural Mobile Broadband solution



Thank You !