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| **Title:** | GISFI-FRN: Management Plan Document of GISFI-Future Radio Network working Group [R2.0] |
| **Source:** | GISFI-FRN Chair |
| **Author(s):** | Krishna Sirohi |
| **Contact information:** | krishna.sirohi@gmail.com, +919899488800 |
| **Purpose:** | An evolving Management Plan Document of GISFI-Future Radio Network working Group to be used as guiding document for the discussion in WG meetings. |
| **Doc number:** | GISFI\_FRN\_201203184 |
| **Meeting:** | GISFI#8, Patna, India, 26th-28th March 2012 |

# Scope of standardization activity in GISFI-FRN

* + 1. Evolve system requirements and the mechanisms for the Active Telecommunication Infrastructure Sharing for all existing and the future Radio Technologies. The study should include all aspects related to :
       - * Technical
         * Regulatory
         * Business Models
    2. Study related to Spectral Efficiency of current networks and the methods to improve.
    3. Evolution System/Network Definitions with suitable deployment architectures addressing the needs of complete solution for the Rural Telecommunication and ICT infrastructure and its smooth integration with existing network. New System definition will evolve suitable guideline for required future products and services.
    4. Study on Future Radio Access Techniques like Cognitive and Collaborative Networks to address the emerging high bandwidth requirements within the available limited spectrum.
    5. Study and provide necessary inputs for the definition of future national programs of development based on Radio Access technologies and the services.
    6. Holistic approach of defining Future Radio Network (FRN) with focus on:
       1. Energy Efficiency
       2. Cost effectiveness
       3. Suitable for rural deployment and sustainable operation
       4. Performance efficiency at every level i.e., *Component, Node & Network*
       5. Multi Radio Technology capitalizing on their best characteristics to meet total telecom need.

# Adopted Questions & Progress

* 1. GISFI-FRN-Q. Sustainable Rural Telecommunication Infrastructure
     1. Adopted in GISFI-FRN-Meeting#2
     2. Question Text is included here. 
     3. ITU-T SG-5 has adopted similar question as Q.22/5. . [Reference- <http://www.itu.int/ITU-T/studygroups/com05/sg5-q22.html>]. The ITU-T Q.22/5 text is included here. 
     4. **National Working Group (NWG-5) TEC (DoT, Government of India), with GISFI-FRN is leading this question in ITU-T. Collaboration between GISFI-FRN and NWG-5 TEC is already established before GISFI Meeting#6. Now, TEC is expected to contribute back to the GISFI-FRN and take leadership role for this question.**
     5. Study Items identified, but not limiting to, under this Questions are:
* This Question will identify, assess and consolidate the challenges faced by developing countries in setting up a low cost sustainable telecommunication infrastructure in rural areas of developing nations. These challenges should further be deliberated to extract various possible technological or engineering interpretations in order to convert these challenges into technical requirement options. This would become a base for system requirements evolution.
* Evolution of system requirements for rural mobile network system specifically addressing such identified challenges of rural deployment.
* This Question will study the generic system requirements (independent of chosen Radio transmission technology) for rural mobile networks system including aspects related to deployment architecture, power consumption, power source, packaging, operation & maintenance etc.
* This Question will also provide guidance on the way to adapt to climate change and to improve the resilience of mobile networks in disaster situations.
  + 1. **Identified (Approved) Work Items:** Following two work items have been approved (GISFI Meeting#6):
* **Rural System Challenges & Principles of Requirements:** Challenges faced by developing nations in setting up sustainable telecommunication infrastructure in rural area and the principles of technical requirements for the identified challenges.
* **Rural System Generic Requirements:** “System requirements of Rural Mobile Network Systems addressing identified challenges of Rural Areas in Developing Nations”
* **Rural System Climatic Change & Resilience to Disaster:** “Rural System characterisation with respect to Climatic change and System ability to increase resilience to disasters.”
* **Handbook :** Guidance on "Challenges of setting up sustainable telecommunication infrastructure in rural areas of developing nations"
* **Survey :** Survey on technological capabilities
  + 1. Status on Work Items
       1. GISFI Meeting # 6 Approved (besides editorial refinements) the first deliverable on the Work Item: **GISFI-FRN: Rural System Challenges** [Document **GISFI-FRN-201109115]**
       2. GISFI Meeting #6 approved the initial contribution on the 2nd Work Item ie **GISFI-FRN: Rural System Requirements [Document GISFI-FRN-201109114].** Further contributions are expected on this work item.
       3. Contributions are invited to start Work Item: **GISFI-FRN: Rural System Handbook**
       4. Contributions are invited to start Work Item: **GISFI-FRN: Rural System Survey**
       5. Contributions are invited to start Work Item: **GISFI-FRN: Rural System Climatic Change & Resilience to Disaster**
  1. GISFI-FRN-Q. Femto Cell Sharing
     1. Adopted in GISFI-FRN Meeting#3.
     2. Question text is included here. 
     3. The question is currently dormant as there is no contribution on this question in last few meetings.
     4. Proposal : Question should be retained and the membership should bring contributions to restart the work.

# GERAN Based network Sharing

GISFI-FRN Meeting # 6 has approved a Technical report on the state of Standardization in 3GPP for the network sharing based on GERAN (GSM/EDGE) Networks [Document GISFI-FRN-201109112]. The report was planned to be prepared by GISFI member experts based on the relevant 3GPP specification and to be submitted to the Indian Telecom organizations like TEC/DoT/TRAI, for its suitable consideration for framing up suitable policy with regard to GSM based Mobile Network sharing in India. The technical report is to be published and to be formally sent to the intended external organizations.

# Ultra Low EM Radiation Mobile Networks

GISFI-FRN Meeting # 5 has decided to work on the study of setting up “Ultra Low EM Radiation Mobile Networks”. Work did not yet progressed on this work item. Contributions are invited. Should membership consider to drop this work item !!!!

# Study on IMT-Advanced: Mobile Wireless Broadband Service

GISFI Meeting #6 has approved the following Study Work items on IMT-Advanced for detailed study and Standardization:

* **IMT-A UE Characterization:** Evolution of national standards to ensure technical, security and regulatory conformance.
* **IMT-A specific network security:** Study of Security Related technical issues with respect to IMT-Advanced and contribute with its inputs to the national agency on telecom security issues.
* **Quality of Service:** Evolution of national standard on Key Performance Indicator (KPI) based on identified performance parameters required to ensure Quality of Service (QoS) of the network as well as Quality of Experience (QoE) of the individual user, in IMT-Advanced Systems.
* IMT-A Access Techniques: Identification and consolidation of the relevant technical characteristics/mechanisms, in Indian deployment context, covering the evolving access methods in IMT-A systems as per ITU-R and 3GPP standards. These mechanism include :
  + Relays
  + Femto/Pico Cells
  + Self Organizing capability
  + Self Configuring Capability
  + Self Optimizing Capability
  + Frequency (Spectrum) Management
    - Dedicated Frequency or selectively chosen
    - Secondary Transmission capability based on Cognitive Radio concepts
    - Licensed or Unlicensed spectrum
  + Heterogeneous Access network: Multi-Radio Technology deployment in Macro (Umbrella Large ) Cell (based on GSM/Edge/3G) and Micro (Small) Cell (based on GSM/Edge, WiFi (IEEE802.11n), LTE-Advanced) with seamless handovers between Macro and Micro cells based on different radio technology.
* **IMT-A Deployment Models with legacy 2G/3G Systems:** Evolution & Definition of various suitable deployment architectures in Indian context (especially rural) for adopting IMT-Advanced Access technology in collaborative fashion with the existing 2G/3G Mobile networks. Such definition of deployment models will become useful guideline for new technology adoption as well as will lead to assessment of  **specific requirements on account of the spectrum usage, power consumption requirements , EM radiation, Cost (CAPEX and OPEX) and the potential Return on Investment**. Therefore it will become necessary data for the **evolution of suitable policies** on every such account of importance and will ensure “Sustainable IMT-A telecom infrastructure in Rural India”.
* **IMT-A Network Sharing:** Study on IMT-Advanced technology related issues for the Network Sharing and the evolution of the solution.

# Study of Future Radio Access technology/techniques

GISFI-FRN has also got approved mandate to start Study on the following Work Items:

1. Cognitive Radio(CR) based Systems
2. Collaborative Networks
3. Access technology for M-M Communications
4. Access Technology for Intelligent Transport Systems

Contributions are invited for defining the study work items with clear scope, approach and deliverables work plan.

# Supporting Organizations, Experts names and their roles

*[ To be updated after discussion with supporting members!]*

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| --- | --- | --- | --- |
| **S.No.** | **Supporting Organization** | **Expert Name** | **Role** |
|  | VNL | Rakesh Agrawal | Chair, FRN  Owner: GISFI-FRN-Q. Sustainable Rural Telecommunication Infrastructure |
|  | Ericsson | Mini Vasudevan | Secretary |
|  | NEC | Anand Prasad | Owner: GISFI-FRN-Q. Femto Cell Sharing |
|  | Subir Sah (Individual) | Subir Sah | Co-Owner: GISFI-FRN-Q. Femto Cell Sharing |
|  | IIIT-Allahabad |  |  |
|  | TCS |  |  |
|  | NSN |  |  |
|  | Huawei |  |  |

# GISFI-FRN Work Plan

*[ To be updated after discussion with supporting members!]*

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| **S.No.** | **Work Item** | **Work Item Description and type of Deliverable** | **Owner** | **Co-Owner** | **Target Date for 1st Draft** | **Target Date for Approval** |
|  | WG-Management Plan | Management Plan document for the entire working group activities. **Management Report** | Rakesh Agrawal |  | On going |  |
|  | GISFI-FRN-Q. Sustainable Rural Telecommunication Infrastructure | | Krishna Sirohi |  |  |  |
|  | GISFI-FRN: Rural System Challenges | Rural Area Challenges and principles of requirement of rural telecom systems. **Technical Report** |  |  |  |  |
|  | GISFI-FRN: Rural System Requirements | System requirements of Rural Mobile Network Systems. **Technical Specifications** |  |  |  |  |
|  | GISFI-FRN: Rural System Handbook | Guidance on "Challenges of setting up sustainable telecommunication infrastructure in rural areas of developing nations". **Technical Handbook** |  |  |  |  |
|  | GISFI-FRN: Rural System Survey | Survey on technological capabilities potentially suitable for rural area deployment.  **Technical Report** |  |  |  |  |
|  | GISFI-FRN: Rural System Climatic Change & Resilience to Disaster | Rural System characterization with respect to Climatic change and System ability to increase resilience to disasters. **Technical Report & Specifications** |  |  |  |  |
|  | GISFI-FRN-Q. Femto Cell Sharing | | Anand Prasad | Subir Sah |  |  |
|  | GISFI-FRN: Femto Sharing Principles and Requirement | **Technical Report & Specifications** |  |  |  |  |
|  | GISFI-FRN: Network Sharing of GERAN based Networks | **Technical report** on the state of Standardization in 3GPP for the network sharing based on GERAN (GSM/EDGE) Networks | Krishna Sirohi | Ericson  NSN  NEC | September 2011 | September 2011 |
|  | GISFI-FRN: Ultra Low EM Radiation Networks | Methods and procedures to setup Ultra low EM Radiation Mobile networks. **Technical Report & Specifications** |  |  |  |  |
|  | GISFI-FRN: Response to TRAI Consultation Paper on IMT-Advanced | **Technical Paper** on selected issues raised in consultation paper. | Krishna Sirohi | NEC  NIKSUN | September 2011 | September 2011 |
|  | GISFI-FRN: IMT-A UE Characterization | **Technical Report & Specifications** |  |  |  |  |
|  | GISFI-FRN: IMT-A Security Issues | **Technical Report & Specifications** |  |  |  |  |
|  | GISFI-FRN: IMT-A QoS Definitions | **Technical Report & Specifications** |  |  |  |  |
|  | GISFI-FRN: IMT-A Access techniques | **Technical Report & Specifications** |  |  |  |  |
|  | GISFI-FRN: IMT-A Deployment Architectures | **Technical Report & Specifications** |  |  |  |  |
|  | GISFI-FRN: IMT-A Network Sharing Issues | **Technical Report & Specifications** |  |  |  |  |
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