RECOMMENDATION ITU-R M.819-2

FUTURE PUBLIC LAND MOBILE TELECOMMUNICATION SYSTEMS (FPLMTS)* FOR DEVELOPING COUNTRIES

(Question ITU-R 77/8)

(1992-1994-1997)

Summary

This Recommendation describes the objectives to be met by FPLMTS to meet the needs of developing countries. The potential of mobile radio technologies, including FPLMTS, to help developing countries "bridge the gap" between their communication capabilities and those in developed countries is given in Annex 1.

The ITU Radiocommunication Assembly,

considering

a) that in developing countries there is an urgent need to provide an economical, reliable and high quality telecommunications infrastructure;

b) that there is a need to provide mobile and fixed services in urban, rural and remote regions;

c) that the relative simplicity of installation and maintenance of radio based telecommunications systems could be of great benefit to developing countries;

d) that there is a need for a flexible, modular system which can be readily expanded in terms of types of service and number of users;

e) that there is a need for rugged equipment to operate reliably in harsh environments and where electric power sources are limited or unavailable;

f) that, giving due regard to propagation conditions and other factors, the telecommunications services provided must be reliable and comparable to those of the fixed network;

g) that users (fixed, mobile) should be able to communicate with any other user whether access is via satellite, mobile or fixed radio links;

h) Recommendation ITU-R M.687 and the relevant ITU-T Recommendations and ongoing studies;

j) that it is important to examine the application of FPLMTS with regard to developing countries' needs at an early stage in the development of FPLMTS so that those needs can ultimately be met;

k) that telecommunication networks in some developing countries are mainly analogue, often use mechanical switching and that this is likely to continue for a number of years,

recommends

that the relevant aspect of FPLMTS, as defined in Recommendation ITU-R M.687, be specified as far as practicable in a manner which allows it to be used to meet the needs of developing countries with the following objectives:

1 that FPLMTS provide, in both urban and rural areas, economical services of high quality and integrity comparable to those of the fixed network. The systems must be capable of serving a wide range of user densities and coverage areas as well as remote regions;

2 that FPLMTS be capable of providing services to both mobile and fixed users, including voice, point-to-multipoint, short messages, paging, facsimile, text and data services;

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* FPLMTS is also known as International Mobile Telecommunications-2000 (IMT-2000).

3 that to allow a system to be introduced with minimum initial investment, FPLMTS design should be modular (easily expandable) permitting flexible growth in terms of number of users, coverage areas and types of services;

4 that FPLMTS take account of the need to match, efficiently and economically, spectrum usage to local conditions where there are only a few users and where severe propagation conditions are encountered;

5 that FPLMTS hardware be capable of being optimized for local conditions e.g. to take account of heavy usage, operation in a variety of environments including extremes of heat and cold, high humidity, dust, corrosive atmospheres and other environmental hazards, recognizing the need to achieve long equipment lifetimes, high MTBF and low maintenance that permit a reasonable justification of the required investment;

6 that appropriate means such as repeaters, etc., be incorporated to provide service economically to more distant users, beyond line-of-sight of a base station. Similarly, it should be possible to serve remote regions by suitable means such as satellites, etc.;

7 that FPLMTS provide an open architecture which will permit the easy introduction of new technology and different applications and will allow choice of equipment based on performance need including the ability to provide voice channels employing higher encoding rates such as 64 kbit/s and 32 kbit/s;

8 that FPLMTS provide user friendly (simple and easy) operation to initiate and receive calls, both national and international;

9 that equipment is designed to take into account the need for low power consumption and the need to operate from a range of power sources;

10 that FPLMTS have the capability of providing an effective alternative to wired local loops in urban areas;

11 that regional FPLMTS be connected to existing analogue/digital networks at suitable points and in some cases at a single point.

NOTE 1 – Information on mobile radiocommunication technology for developing countries is given in Annex 1.

ANNEX 1

Mobile radiocommunication technology for developing countries

1 Introduction and summary

Recognizing the disparity that exists in the telecommunication infrastructures in the world, this Annex points out the potential of cellular technology (and its evolution into FPLMTS technologies) to help developing countries bridge the gap.

Report ITU-R M.1153 and Recommendation ITU-R M.687 include some of the relevant aspects with the idea that future systems – FPLMTS – can serve the needs of developing as well as developed countries.

FPLMTS have been conceived primarily for mobile telecommunications which of course is of interest to developing as well as developed countries. The objective of this Annex is to emphasize the needs and interests of developing countries by promoting the application of FPLMTS for fixed services. It should furthermore be stressed that the use of FPLMTS for such applications is also attractive to developed countries.

Key objectives for FPLMTS that could benefit developing countries are:

		Section reference
–	Fixed service	§ 4.1
–	Standardization as a means of reducing costs	§ 4.2
–	Flexibility to start from a small, simple, configuration and grow as needed	§ 4.3
–	Accommodation of special needs	§ 5
–	Commonality with remote areas of developed countries	§ 6
–	Large cells, repeaters, use of satellites	§ 7

2 The telecommunications gap*

The role of telecommunications in the development process as a means to increase productivity and efficiency, as a substitute for, or complement to, transportation and to save energy, etc., is today more important than ever but the gap between developed and developing countries is wider than ever. This has been clearly indicated by the Independent Commission for Worldwide Telecommunications Development set up by the ITU in 1983.

In addition the limited financial resources available to developing countries lead to the allotment to telecommunications of resources insufficient to close the "telecommunications gap" either as much or as quickly as required.

3 The potential and benefits of FPLMTS technologies

Present cellular technology and its evolution into the FPLMTS technologies by the end of the century, offer great potential to help developing countries bridge the gap in a more effective way.

FPLMTS is a radio-based approach and so offers all the advantages of wireless network access. Figure 1 provides an illustration of some of the possible uses of FPLMTS radio interfaces for wireless network access in the fixed service. The actual definition of FPLMTS radio interfaces is dealt with in the appropriate FPLMTS Recommendation.

With FPLMTS a scheme can be established which enables a simple start-up with the provision of basic telephone services that can evolve, as required, to higher user information rates in the local loop and to a full mobility service. This is particularly appropriate when development capital is scarce as it may be the only way to keep modernization affordable.

The global acceptance of FPLMTS should enable mass production for the global market and multiple applications. This, together with global competition should lead to low cost products.

Some of the aspects that make FPLMTS an attractive alternative to traditional wireline systems for telecommunications services are:

- capability for rapid provision of voice and non-voice services in new areas;
- growth capacity and flexibility;
- cost reductions resulting from technology improvements, modular design and mass usage of FPLMTS;
- capability for covering wide geographical areas.

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* *Note from the Director, Radiocommunication Bureau* – The statements made in this section are based on the following ITU publications:
- "Contributing Telecom to the earnings/savings of foreign exchange in developing countries", April 1988.
- "Benefits of Telecom to the transportation sector of developing countries", March 1988.
- "Telecom and the National Economy", May 1988.
- "The Missing Link". Report of Independent Commission for Worldwide Telecommunications Development, ITU, 1984.