

# **Options for Terrestrial Connectivity in Sub-Saharan Africa**

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## **Executive Summary**

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This report makes an inventory of existing transmission backbones in Sub-Saharan Africa, and discusses issues related to solutions for improved utilization of such networks.

Mobile GSM operators in Sub-Saharan Africa are rapidly covering most populated areas with telephone services. To reach new areas, the operators keep expanding their transmission links, and the result is the emergence of new telecommunication backbone networks. The mobile operators now own and control the bulk of transmission backbone capacity in Sub-Saharan Africa. Regulation and competition between operators have largely prevented shared use of these emerging backbones.

A number of issues are raised in the report: The lack of open access, the dominating position of the GSM operators, the pricing of transmission services and regulation.

It is Sida's intention to raise these issues among African operators, regulators, policy makers, donors and financing organisations.

## Executive Summary

The development of mobile telephony and related services is of great interest for economic, social and political activities in developing countries. At the same time, the awareness of the potential has been limited among important actors such as governments and development agencies. Sweden and the Nordic countries have been at the forefront of mobile telephony development and have extensive knowledge of its effect on ICT services. Sida has been able to build on the Nordic experience and has for many years been a development partner in the ICT area.

Sida's ICT secretariat has over the last few years in several ways been engaged in improving the understanding of the effects and the benefits of mobile telephony for developing countries, sometimes in partnership with private companies (mobile operators and telecom equipment suppliers).

This report was commissioned by Sida with the objective to increase the awareness among governments, regulators and development agencies of the growing telecom backbone networks installed by mobile operators in Sub-Saharan Africa. The objective is to describe the actual situation to search for solutions to optimal utilization of backbone networks.

At the time when the first mobile licenses were granted in Africa, the effect of the dramatic growth of mobile telephony was difficult - if not impossible - to foresee. Now, mobile operators generate the bulk of the traffic, both domestic and international. Mobile technology requires a great deal of transmission capacity, which the fixed line incumbents were supposed to provide for the new networks. The rapid – and unexpected – growth of mobile subscribers caused the mobile networks to grow geographically into areas where the fixed networks did not reach. Several reasons – the speed of growth, the incumbents' weak finances, regulatory obstacles and the commercial aggressiveness of the new operators - all caused the mobile operators to start building their own transmission networks. The communication regulators were forced to allow this in order to ensure expanded geographical coverage. However, most of these networks are proprietary and do not reach across the national borders nor can other national ICT players like the ISPs use them.

It is obvious that liberalization of the communications sector in Africa has greatly stimulated economic development. However, the competitive situation with many new players and the current telecommunications regulation have not fostered collaboration and common solutions to joint problems. Consequently, there is little infrastructure sharing among operators even in areas where it would substantially reduce investment.

In this study, we have investigated the mobile and fixed backbones of 18 countries in Sub-Saharan Africa. Our analysis shows that the mobile operators already provide and fully control the lion's share of transmission networks in Sub-Saharan Africa; the average for the 18 countries is 70 percent, and in 15 of the studied countries mobile operators owned more than 50 percent of all backbone links and in only 3 countries had the incumbent a larger network.

The study found a close correlation between the population coverage and the coverage of the transmission backbone networks. It concludes that when population coverage is

above 80 percent, the transmission backbone networks have more or less countrywide coverage, while coverage below 50 percent indicates that major gaps exist in the backbone networks before they can be considered countrywide, providing adequate reach to major population centres. According to the statistics published by the GSM Association, only 23 percent of the Sub-Saharan countries fall in the first category while 40 percent still have major gaps in transmission links.

The main operators in Africa expect coverage to reach 80% of the population in most countries. From this expectation follows that a great deal of infrastructure still has to be built, and that the operators' strategies will lead to backbones covering all population centres.

The study shows rapidly growing backbone infrastructure in Sub-Saharan Africa. That does not mean it is available for forming "national backbone networks", by which we mean transmission links that are available to the various telecommunications players on commercial terms. In most of the countries in Sub-Saharan Africa, only the incumbents operate national transmission backbones. The mobile networks are normally not "national" since either regulation prevents their availability to other sector players or the operators themselves are not interested in selling transmission capacity.

The study has identified a number of important issues with regard to the creation of national transmission backbones.

### **Open Access**

The term Open Access imply that backbone facilities should be provided to all interested parties on equal, transparent terms and that access charges should be cost based. Optical fibre cables are often assumed to be transmission media, and the general opinion is that the costs of fibre would be very low.

In business terms, Open Access essentially means that all operators agree to compete only on the service layer and not on the infrastructure layer. While this might be possible in the EU countries - with unbundling of the local loop, with many competitors providing transmission capacity and with a strong harmonized regulatory environment - we question the applicability of these solutions to the African environment. None of the preconditions in Europe apply to Sub-Saharan Africa.

A key issue is whether fixed and mobile operators are willing to give up their dominant position on backbone transmission in favour of joint national backbones operating on Open Access principles.

### **Pricing of transmission services**

Since the mobile operators would be the largest single customer group for any national backbone network, their own costs can be used as guidance in establishing the market prices for transmission capacity. The current prices charged for transmission are often many times higher than the opportunity cost of building own capacity. It will be a major challenge to get the fixed incumbents to agree to drastic price reductions, particularly since they have already lost substantial market shares both for voice and transmission services.

### **Fibre or Microwave Transmission.**

ICT services are not likely to take off in Sub-Saharan Africa unless there is ample supply of bandwidth at low costs. Most Governments in Sub-Saharan Africa that have developed ambitious national ICT policies and plans hold this view. Some Governments have even aspirations of constructing national fibre backbone networks, often forgetting that telecommunications are in the hands of private companies.

Our conclusion is that fibre cables will be very slow in materializing unless the mobile operators get involved. The latter generate the bulk of demand, without which the fibre cables would be uneconomical. As already mentioned above, market prices must be dramatically reduced to interest the mobile operators and to increase demand.

**Regulatory issues**

A liberalization of the telecommunications market is rapidly taking place in Sub-Saharan Africa. The regulatory restrictions imposed on mobile operators regarding resale of transmission capacity have mostly been removed. Regulation no longer seems to hamper the efficient use of mobile backbone networks.

A much bigger regulatory issue needs urgent attention, namely the lack of appropriate legislation and regulation for addressing the mobile operators' dominant position. This applies both to the domestic and to the regional markets. Closed regional transmission networks could be harmful both for the international traffic and for the domestic services. The continental character of the major mobile operators is a regulatory issue without answers.