

ROYAL MINISTRY  
OF FOREIGN AFFAIRS  
Norway

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**TELE-  
COMMUNICATIONS  
IN THE SADCC  
REGION**

**SUMMARY**

by  
The Centre for  
Development and Technology  
University of Trondheim



**SECTOR EVALUATION**

**TELECOMMUNICATIONS**

**GENERAL ANALYSIS OF SECTOR POLICY**

**EVALUATION OF FOUR PROJECTS IN THE  
SADCC REGION**

**CONCLUSIONS  
AND  
RECOMMENDATIONS**

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**EXECUTIVE SUMMARY - FINAL REPORT**



## PREFACE

The present telecommunications sector evaluation study has consisted of two phases. The first phase comprised the desk study resulting in an Inception Report, and the field work was done during the second phase. The results from both the desk study and the field work are presented in the *Main Report* and in a volume of *Annexes* in addition to this *Executive Summary*, which broadly covers the first and second Chapters of the Main Report.

The evaluation project was commissioned to CDT, The Centre for Development and Technology, University of Trondheim, and the following Team has undertaken the evaluation:

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Mr. Lomøy, the former head of CDT, took actively part in the evaluation until the end of phase 2. At that time, he got a position in NORAD and left the Team before the reports were completed. For practical reasons, Mrs. Muchelemba could not take part in the final editing process.

Mr. Hellenes has been responsible for editing the report.

Trondheim, March 1991.

**EXECUTIVE SUMMARY**

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## **1 INTRODUCTION. NORWEGIAN AID OBJECTIVES AND TELECOMMUNICATIONS**

Norway has supported a number of telecommunications projects during the last decade (cf. Annex H). In the same period the discussion about objectives and strategies for Norwegian development assistance has focused on concepts related to poverty alleviation, target group oriented aid in addition to economic growth. One of the purposes of the sector evaluation is to assess "the compatibility between the sector policies and the principal objectives of the Norwegian development assistance" (Terms of Reference, 3.10 iii).

The conclusions and recommendations of this study, will, among others, contain the following issues:

- \* *Discussions on telecommunications sector policies in view of the general objectives of Norwegian development assistance.*
- \* *Discussions on telecommunications projects in the SADCC region in view of these objectives.*

In this introductory chapter the Team shall outline the objectives of Norwegian development aid as a background for the evaluation.

The most recent and comprehensive statements of the objectives of Norwegian development assistance are found in the two government white papers from 1984 (no 36) and 1986-87 (no 34).

While both papers agree on the overall objectives,

- \* *to contribute to lasting improvement in the economic, social and political conditions of the population in the developing countries*
- \* *to focus particularly on the needs of the poorest groups and countries*
- \* *to avoid creating dependence on continued aid,*

their perspective also differ in some respects.

The former (36) puts greater emphasis on a basic needs oriented strategy, while the latter (34) explicitly acknowledges the existence of several, in some respects competing, objectives. The major objectives, as stated in the last white paper, are

- \* *proper management of natural resources, nationally and internationally, to secure a sustainable development*
- \* *economic growth as a necessary precondition for improving living conditions*
- \* *improve living conditions of the poorest groups; in addition to assistance aimed at general economic growth, Norway should also give aid directly aimed at these groups. Particular emphasis is placed on improving the situation of women. This has been given additional strength by the adoption of a special strategy for assistance to women*
- \* *secure human rights*
- \* *promote peaceful coexistence between nations and regions.*

In addition, some other principles are stressed:

- \* *assistance should be based on the plans and priorities of the recipient countries*
- \* *assistance should be untied, and Norwegian suppliers should only be used when prices are internationally competitive. Use of Norwegian suppliers are accepted if they are not more than 10% above international market prices.*

The 1986-87 white paper explicitly discusses the relationship between economic growth and poverty alleviation. The white paper stresses that support aimed at increasing the general economic growth is a



necessary, although not sufficient, condition for improving life for the target groups.

The SADCC region has been a main recipient of Norwegian assistance to the telecommunications sector, funded from a separate grant for regional SADCC projects. Though the general objectives cited above are also valid for the SADCC support, this assistance also reflects a strong Norwegian support to the basic objectives of the SADCC cooperation. As spelled out in the Lusaka declaration, these are primarily to reduce the dependence on South Africa and to promote cooperation between the SADCC countries.

There is therefore a strong political dimension in the SADCC support, which may override the concern with the general objectives of Norwegian aid. Both SADCC's strategy in the initial years, and the Norwegian assistance to the cooperation, have focused heavily on major infrastructural activities (particularly within communication and energy) aimed at realizing the general objectives of the cooperation. In its content the assistance to SADCC has therefore come to differ from the main thrust of Norwegian aid during the 80's.

SADCC's role in the projects has normally been limited to the investment phase. The operation of the services created is the responsibility of the individual countries. The emphasis has therefore been on investment projects, with less emphasis on strengthening the institutions that are responsible for the future operation of the projects. Even if some changes have occurred lately, SADCC projects probably still differ in this respect from bilateral projects.

There is no overall Norwegian strategy for the assistance to the telecommunications sector, spelling out the objectives of this assistance and priority areas for Norwegian support. The present study may provide some background for the preparation of such a strategy.

The objectives of the Norwegian sector assistance will therefore be discussed on the basis of the objectives of some of the projects supported by MDC during the last years, as spelled out in the project documents.

## **2 A SHORT DESCRIPTION OF THE PROJECTS AND THE EVALUATION. MAJOR FINDINGS**

The projects were selected so as to present a representative picture of the assistance in this sector.

In evaluating the projects, the Team has put emphasis on the following four points:

- 1)-The planning and implementation process.*
- 2)-The functioning of the projects after implementation.*
- 3)-The use of the projects.*
- 4)-The impacts of the projects.*

### **REG 004 Microwave radio relay link Botswana-Zimbabwe-Zambia**

The project was initially planned for construction of an analogue microwave link with a capacity of 960 voice channels from Francistown in Botswana to Bulawayo in Zimbabwe and further to Livingstone in Zambia. A spur link from Livingstone to Kasane in the Northern part of Botswana, and some additional multiplexing equipment on an existing microwave link from Livingstone to Lusaka, was included later.

A total of 20 stations with buildings, towers, radio equipment and power supplies were included in the project, together with training and maintenance facilities and support.

The project was initiated in 1981 and financed jointly by NORAD (about 60 MNOK) and SIDA (about 45 MSEK). The radio equipment and total project management was the responsibility of NERA A/S, now EB Nera, and for the multiplex equipment Ericsson, Sweden. PTC, Zimbabwe was responsible for the civil works.

The stated purpose of the project was to improve the telecommunications services between the three countries and provide connection to the Pan African Telecommunication Network (PANAFTEL).

The project was well conceived and well executed. The analogue technology chosen at that time was a reasonable choice, and there are no major difficulties in the process of transition to the future all-digital network.

There were no major technical problems. A couple of design weaknesses in the equipment were immediately remedied by the manufacturer.

The project managers were responsive and flexible, and the Telecommunications Administrations involved were satisfied with the cooperation.

The training was adequate, and so was the supply of spare parts. Delays in repair of equipment sent to the factory were attributed to the customs authorities, on both sides.

Economically, this project seems to be very viable. However, so far there is no indication that improved telecommunications has increased inter-regional trade-flows between the countries.

The project has contributed to a reduction in the dependence on RSA as to telephone traffic. In general, particularly as to trade-flows, the improved telecommunications system has so far *not* reduced the dependence on RSA.

#### **REG 020 Microwave Radio Relay System For North-Western Province in Zambia**

The project comprises the construction of a radio relay system in the North-Western province of Zambia, a high capacity link from Chingola to the provincial capital of Solwezi, and 300-channel links between Solwezi and Zambezi, and Solwezi - Mwinilunga. The project includes 23 stations with buildings, towers, radio equipment and power supplies, and the system connects all the regional centres of the province to the national network.

The project also contains a component of technical assistance to the PTC, the Telecommunications Corporation of Zambia, with special attention to maintenance.

The radio link project was initiated in 1982 and financed by NORAD at a cost of (75 + 12) MNOK + 4.5 MZK. The agreements were concluded in 1983 and 1986. EB NERA was the supplier of the radiolink project, and start of service of the system was 1985.

The purpose of the project was to extend the national telecommunications system to the last remaining province in Zambia, the North-Western Province, down to district centre level and to form a basis for extension into the rural areas of the province. It shall also be an element of a future international connection between Zambia and Angola in accordance with the PANAFTTEL plans.

The system structure is considered to be suitable for its purpose. The traffic is still low, but some of the capacity is allocated for the future links to Angola. The system does not allow for distribution of TV programs beyond Solwezi, which is considered as a disadvantage, in particular in view of the unstable political situation in the border areas.

EB Nera have delivered a system for which the PTC are satisfied. The program management has been flexible and responsive to problems that might arise during the implementation. The technical assistance project has ensured the permanent assistance of maintenance personnel for which there is a strong need. Our impression is that the resident NORAD personnel are filling very important functions, and that their services are highly appreciated by the PTC. The number of personnel is, however smaller than anticipated, explained by the lack of candidates, and the security situation.

For the time being the economic, social and political impacts affect Zambia only.

The North-Western province is sparsely populated and economically very backward. It is thus not to be expected that improved telecommunications in itself should bring about a substantial change in development.

Revenues from telecommunications created in the province do not cover the costs of operating the system.

The completion of REG 020 implies that the district headquarters in the province have become a part of the national telecommunications system to the effect that the local bureaucracies are able to communicate efficiently throughout the political and administrative hierarchy.

So far, these political and administrative impacts are the most obvious ones.

**REG 024 Microwave Radio Relay System Zimbabwe - Mozambique - Malawi**

The project comprises the construction of a high capacity digital microwave radio link system from Harare via Bereru to Tete in Mozambique and further to Blantyre in Malawi.

This link has been on the SADCC list of priority projects, and fills significant gaps in the PANAFTEL system. In addition the system provides important national communications links, in the Machona East Region of Zimbabwe and in Mozambique.

Responsible Coordinator for the project was the Zimbabwe PTC, and NORAD was responsible on the donor side. The project cost was estimated at NOK 55 million plus SEK 40 million, which was financed by SIDA.

The radio equipment was delivered by EB Nera, and the multiplexing equipment was delivered by Ericsson. Local contractors were used for the civil works.

A survey of the part from Harare to Susamoya and the stations in between, and discussions with representatives of the telecommunications authorities, gave a favourable impression of the contractor's work. The steering committee in Zimbabwe and Mozambique, which had monitored the implementation had performed a very useful function and represented a positive experience.

Parts of the civil work had been difficult and expensive, in particular when building of access roads and earthings systems are concerned.

It was apparent that this new microwave link was a starting point for expansion of telecommunications into the rural areas. The repeater stations were equipped with multiplexing equipment which allows voice channels to be inserted and dropped. These would in turn allow operation of telephone switches to which subscribers were connected via individual lines, and party lines, also electronic ones.

The equipment has been running since September last year without any special problems, and the system will be commissioned in September, 1989. There is therefore no operational experience from the system.

It is too early to make any assessment of the project as to the economic, social and political implications.

### **ZAM 100 Commodity Assistance, Rural exchanges**

The project comprises the delivery of rural telephone exchanges of type MCR (Metaconta Rural Exchanges) manufactured by STK Alcatel and delivered to the Zambian PTC.

The project was initiated in 1984 and completed in October 1988 with a total cost of NOK 24.4 million and local cost K 4.9 million.

The 16 exchanges came in addition to 26 exchanges of the same type and financed by the World Bank, and it is important from a maintenance and logistics point of view to standardize on the type.

The PTC was very satisfied with the exchanges, both from operational and maintenance point of view. The only difficulty mentioned were lightning strokes.

The MCRs are repaired at the Electronic Repair Centre in Lusaka, and of the 1143 items received for repair, 1133 were repaired and not a single one returned to factory.

The exchanges are in general well utilized, and expansion of capacity is now required. Two exchanges are underutilized due to inadequate development of external plant.

Since the exchanges are located in places representing the lowest level in the centre hierarchy in Zambia, they are important for the political and administrative communications in the country.

They are also vital for further expansion of the telecommunications system down to the rural level.

## **3 CONCLUSIONS AND RECOMMENDATIONS**

### **3.1 Telecommunications sector policy in general: Conclusions and recommendations**

Our analyses, conclusions and recommendations are based on the basic assumption that the developing countries' long run objective is to develop into societies with a variety of industries being able to compete on the international market. We thus take it to be a basic precondition that the developing countries wish to, or have to, adopt to the prevailing trends of international economic development.

Furthermore, our conclusions and recommendations shall take into account the general objectives of Norwegian development assistance.

According to the above conditions, the Team finds it reasonable to state:

- \* *Interregional telecommunications projects (international projects) are clearly profitable and vital for international trade, regional cooperation and international contacts in general, and the Team concludes that such projects should to be supported by NORAD. It is a fact that Norwegian companies have the technology and competence to assist in such projects.*
- \* *On the national level, Norway should be prepared to support "missing main links" in the national networks. Such projects are favourable economically, socially and, not the least, politically, and constitute a precondition for rural telecommunications development at a later stage. As in the case of interregional projects, Norwegian companies can contribute.*

The question of Norwegian support to telecommunications becomes more complicated when considering further expansion of the national networks. One has to evaluate the question of urban versus rural networks, of regions (areas) experiencing growth versus backwards regions, the question of supporting "growth poles" versus balanced growth in all regions and balanced growth in all parts of regions, and the question of which groups of people should benefit most.

We shall discuss the matter in view of two basically different strategies of development:

*Strategy 1: A strategy primarily aiming at equality with respect to development among regions (provinces, districts), among industries, and among social groups of the population*

*Strategy 2: A strategy aiming at a fast economic devel-*

*opment in regions (areas) with the best growth potential.*

The principle of equality in strategy 1 is advantageous in order to avoid social disparity and political instability. However, resources are used in a very "scattered" way, which may hamper economic growth. A balanced growth strategy may develop a rather large unproductive public bureaucracy, busy in planning and administering projects never implemented or implemented at a very slow pace. There are few incitements for entrepreneurship and for mobilization of private resources, production, distribution and transport may not be cost-effective, and the working moral may be low.

The main advantage of strategy 2 is the focus on releasing productive resources, private capital, know-how and entrepreneurial skills. The largest disadvantage is a tendency to create and possibly enlarge inequalities among regions, industries and groups of people. High migration may also be a problem, creating slums and increased number of criminals in the bigger cities.

Experience from developing countries over the last decades shows that countries, which have mainly followed strategy 2, have had the highest economic growth. The economic benefits have been very unevenly distributed, however, both among regions (areas) and among groups of people.

Economic growth is a major objective of Norwegian development assistance. However, another important objective is to support projects improving conditions of the poorest and least resourceful groups. While the first objective is supported by strategy 2, the second objective seems to be better met by strategy 1.

*\* In a long run perspective the strategies may be combined. Hence both the above mentioned objectives may be accounted for. By focusing on development of productive forces, particularly in areas with good growth potentials at the early stages of development, the economy may come faster to a "take-off". In a later stage, more attention could be paid to equity problems.*



For political/social/cultural reasons, however, all regions (provinces) should be involved in the growth process in some defined priority areas.

Traditionally, the estimated internal rate of return on investment is used as an economic criterion for evaluation of telecommunications projects. The incremental revenues generated by a new project are estimated (as a proxy for benefits) and are compared with the investment, operating and maintenance costs over a certain time span.

Since the effects of telecommunications projects have a much broader perspective, however, the following conclusion is valid:

- \* *Although a network expansion in a given area may be implemented and operated at a loss for the telecommunications organization, the expansion may be favourable from a national economic point of view. In order to evaluate expansion projects in a broader context, cost/benefit analyses should be used. Expansion projects may be evaluated and chosen among, according to the ratio of benefits to costs.*

The cost-benefit analysis reflects the economic potentials of an area and is as such a useful tool for giving priority to specific projects and to the development of growth poles.

As could be expected, cost/benefit-analyses undertaken in several developing countries indicate that the ratio benefit to costs is higher the more urbanized the area, and highest for the higher income groups. However, the ratio is positive also in many rural areas, indicating, among others, the existence of huge unsatisfied demand, and the high costs of alternative forms of communication.

- \* *As a conclusion, we will state that in a long run perspective, NORAD should focus more on strategy 2 than strategy 1 in the first stages of development, primarily supporting the objective of economic growth. The main point is that such a policy will bring the country in question faster to a development stage, where it is economically feasible to start devel-*

*oping backward areas. When this stage has been reached, NORAD should support projects in such areas.*

- \* NORAD should thus be willing to support telecommunications project in urban areas, as well as in selected rural areas. When concentrating on rural areas, support should be given on the basis of a cost/benefit analysis, and as a part of an integrated rural development plan.*
- \* Whether or not Norwegian firms should contribute in rural telecommunications projects is an open question. So far, Norwegian firms have little experience in this field.*

The above conclusions and recommendations are based on a long term perspective. In a more short term perspective and according to a policy giving more weight to other objectives than economic growth, the conclusions may be others.

A fast expansion of the telecommunications networks tends to create "bottlenecks" in the system, which may severely reduce operating capacities. Inadequate capacities result in huge numbers of unsuccessful calls, reducing the efficiency of private and public enterprises and organizations. Thus:

- \* NORAD should be prepared to support projects eliminating such bottlenecks. The benefit/cost ratio is likely to be very high for such projects, and the gain is distributed to all areas and groups of people connected to the system.*

For rural telecommunications projects NORAD should apply "an integrated development approach". More generally, the question of "a sector approach" compared to "an integrated development approach" depends on the type of project considered. The Team draws the following conclusion:

- \* *All projects concerning rural telecommunications should be evaluated in a context of integrated development plans, and the more so in poor and remote districts. Main national links, and particularly international links, which are economically profitable and vital for developing the countries' economic potentials, do not need the same broad scope of evaluation.*

The choice of appropriate technology is important for all development projects, and in particular for telecommunications projects where the technology content is so high, and where the choice will have strong impact on performance, costs and ease of operation.

It is not possible to define generally what appropriate technology is. However, as a general rule the latest technology should be applied, because of:

- *improved performance*
- *wider choice of equipment and stronger competition on the world market with a corresponding reduced cost*
- *easier operation and maintenance*

One particular question concerns digital versus analogue systems. The digital systems are basically more complex, but once they are properly developed, mass produced and with adequate operational experience, they are usually superior in performance, lower in cost and easier to operate and maintain.

The Team thus conclude:

- \* *As a general rule, digital technology should be preferred for future projects supported by NORAD.*

A critical element in rural systems is the supply of power. Since modern electronics can be constructed with a decreasing requirement of power, the renewable power sources become more attractive. Solar power generators are one of the possibilities. It must be empha-

sized, however, that the conditions must be suitable with regard to sunshine statistics. It may also be necessary to use supplementary power sources, like wind generators.

- \* Because of the cost-decreasing elements, solar power will be more attractive in the future in places with favourable sunshine statistics.*

An important objective of Norwegian development aid is to secure a sustainable development, and to avoid creating dependence on continued aid. Telecommunications development has the following characteristics:

- \* Since telecommunications are a highly developed, technologically advanced industry, with relatively few, quite large firms competing on the world market, most developing countries have to import a major part of investment facilities and spare parts. In such a respect, the developing countries will be dependent on developed countries in a long run perspective.*

*Furthermore, the telecommunications sector needs well educated and highly trained manpower, particularly in engineering, a fact which may create dependence on outside help for many years to come.*

- \* The marginal capital-output ratio in the telecommunications sector (the relation between new investment and expansion in output) is large compared to most other industries.*

*In many countries the foreign exchange component range between 50 and 60 percent of total investment requirements in the sector, for some countries even higher. As such, the telecommunications sector is rather foreign-exchange-intensive, and thus very much dependent on the balance of payment situation. However, as a result of improved and expanded*

*telecommunications, foreign exchange requirements of a country may be reduced in other sectors of the economy.*

*So far, there is no research indicating the net effects on the balance of payment.*

Another aid objective is to contribute to lasting improvement in the economic, social and political conditions of the population in the respective developing country. Generally, the Team concludes:

- \* Like other infrastructure investments telecommunications are important for the above objective.*

*Since telecommunications are a cost-declining industry, tending to become cheaper relative to other means of communication, the relative importance of the sector is increasing with respect to economic, social and political integration.*

An objective of Norwegian aid concerns environmental issues. The main conclusion is:

- \* To establish and operate telecommunications systems create few environmental problems.*

*To the extent telecommunications can substitute transport, or be a means for making better utilization of transport fleets, the sector contributes to reduced energy consumption. Misuse of cars is a widespread problem in many developing countries, very much caused by false or inaccurate information. The potential for saving transport seems to be rather big.*

*Research both in developed and developing countries support this conclusion.*

According to the Norwegian aid objectives, particular emphasis is placed on improving the situation for women.

In developing countries, the development of rural telecommunications is important for health and different aspects of family welfare. Traditionally, women have taken responsibility for these matters. Therefore, a strong focus on women's situation and welfare, would imply giving some priority to development of rural telecommunications.

With respect to telecommunications development, the Team will conclude the following:

- \* Like in many other technologically oriented sectors, few women are employed in telecommunications. Planning authorities in ministries and in the telecommunications organizations have not put particular emphasis on this question. The question is one of attitudes, both on the part of men and women. NORAD could contribute by emphasizing the matter more strongly.*

*A fast development of rural telecommunications could contribute to improving conditions for women.*

The stated Norwegian objectives also put emphasis on national plans and priorities. The following conclusions seems reasonable:

- \* Telecommunications are not given the priority the sector deserves in national development plans and recurrent budgets.*

*Although having problems with qualified manpower, the telecommunications organizations are rather professional entities, whereas planning ministries often lack the competence needed to fully integrate the sector in the development plans.*

*At provincial level, the Team experienced that there were no cooperation between the telecommunications sector and the Regional Planning Authorities with respect to planning. PTC did its own collection of essential statistics in the North-Western Province,*

*information which was available in the Regional Planning Office. Hence, telecommunications were not well integrated in the Provincial Development Plans.*

Another key issue is the question of turn key projects compared to projects involving to a higher degree the Local Administration in the planning and implementation process.

Turn key projects are usually most effective for system implementation with given performance and within a specified time. This is mainly because the responsibility is uniquely defined. The responsible contractor can direct its efforts to the "critical path" of the project, whether this is transportation, civil works or equipment installation.

The turn-key approach is not so easy to combine with strong involvement from the receiving side. Difficulties can therefore arise when the receiving organization shall take over the responsibility for operation and maintenance of the system.

It is also a disadvantage of turn-key projects that the learning element for system implementation is missing.

A general rule for the choice of project cannot be given, but turn-key projects are most attractive to solve unique problems for which a timely completion is important, such as removal of bottlenecks in the telecommunications system.

A stronger participation by the Administration is important for projects initiating activities for which the Administration will bear the long time responsibility, and where building up own competence is essential. It must, however, be emphasized that the Administration must have the necessary resources to accomplish their part, in terms of manpower and financial resources. This was a problem for the ZAM 100 project.

Norwegian companies have been strongly involved in the projects evaluated by the Team. According to Norwegian development policies, Norwegian firms may be involved in the aid projects if they are competitive in the world market. In general, the Team concludes:

*It is very difficult to establish a competitive price level for delivery of telecommunications equipment, and*

*particularly for equipment delivered and installed in developing countries.*

*This is due to the fact that the telecommunications industry is considered as strategic in the wide sense in most industrialized countries, and therefore supported in different ways, through development contracts and protective procurement systems.*

*Regarding deliveries to developing countries, there could be additional elements of support that distort the competitive situation.*

Prior to the implementation of the REG 004 project, the combination EB NERA and Ericsson had been evaluated by SWEDTEL, the consultancy company of the Swedish Telecommunications Administration, as competitive on international level.

Also the offer from EB NERA / Ericsson for this project was examined by the Contract Revision Office of the Norwegian Defence Supply Command, and by independent telecommunications consultants.

The REG 020 project was initiated by an international invitation to tender by the PTC of Zambia. Companies from the United Kingdom, Japan and Germany in addition to EB NERA submitted their bids, and EB NERA was selected after a thorough evaluation of price, delivery time etc.

The REG 024 project was awarded EB NERA on the basis of direct negotiation. This approach was chosen based on previous experience with the company, both with respect to cost and with respect to the cooperative relations with the telecommunications administrations concerned. In addition, the project would be closely monitored, economically and technically, by the telecommunications consultant of NORAD.

The ZAM 100 project, telephone exchanges to rural areas in Zambia, was an extension of an earlier delivery of 26 automatic exchanges by the Norwegian company STK, then a subsidiary of ITT, now STK Alcatel, financed by a World Bank loan. This should demonstrate the competitiveness of this supplier.



*The conclusion to be drawn from this is that the suppliers used for these projects are competitive in price and equipment performance, and contact with the administrations involved indicate clearly that the companies are appreciated for their cooperative attitude.*

### **3.2 Telecommunications policy in the SADCC region: Conclusions and recommendations**

Telecommunications development is one of the priority areas within the SADCC regional cooperation, and considered to be one of the basic requirements for economic development in the region and for effective cooperation among the member states. The main aim of regional telecommunication development is to reduce the dependence on the Republic of South Africa as a transit point for intra-regional traffic and promote increased communication between the member states. The Southern African Transport and Communications Commission (SATCC) is therefore responsible for promoting projects with a regional impact such as the PANAFTTEL microwave network, satellite earth stations, international switching centres etc.

The telecommunications development within the SADCC region is based on the SATCC Ten-year Development Plan of January, 1987 which primarily consists of project listing country by country. The Plan is due for revision in 1991 and the new plan will be based on strategic planning, and each SADCC country is supposed to have a telecommunications master plan. SATCC's priority areas will include the completion of the "missing links" in the PANAFTTEL network, to Namibia through Nghazi in Botswana and to Angola through the North-Western Province of Zambia.

As a matter of policy, SATCC's involvement in telecommunications development ends at the investment stage. The administration and management of the telecommunications projects fall under the responsibility of the national telecommunication authorities. With regard to manpower development in the telecommunication

sector, basic training (i.e. at technician level) is a national responsibility, while the medium to high level training, technical training and management training, is proposed to be conducted on a regional basis.

At the national level, each SADCC country aims at providing telecommunications services to both urban and rural areas. Telecommunications development is included in the national development plans, as a subsector together with transport in most countries. There is generally a lack of integration between telecommunications and other sectors both in the national plans, and more particularly so for planning at sub-national level. In several countries development of the local telecommunications network is linked to different types of growth centre strategies for regional/rural development.

Only **Zimbabwe** has a fully developed telecommunications master plan.

Most countries seem to have followed a strategy for telecommunications development with three stages

- 1. establishment of a national network covering the main centres of population and economic activities,*
- 2. coverage of the whole country down to the level of provincial or district headquarters, and*
- 3. emerging approaches to rural telecommunications.*

The basic policy of the **Zambian** Government is to provide telecommunications services to support the productive sectors of the economy such as mining, manufacturing, agriculture, tourism, etc. Thus the existing telephone network covers all provincial capitals and almost all district centres throughout the country. Within rural telecommunications priority is given to commercial farming and other productive activities.

In **Botswana**, the Government policy is to provide telecommunication services to all urban areas and a telephone service facility to all rural communities or villages with at least 500 inhabitants using pay phones (public telephones). A strategy for rural telecommunications is under development.

In **Mozambique**, the sector strategy aims at interconnecting all provincial capitals to the national digital system while improving rural telecommunications simultaneously. Because of the security situation, Mozambique has great difficulties in establishing a reliable, terrestrial network.

The financial policy with regard to telecommunication development in all SADCC member states is based on the profitability of the entire telecommunications network which means complete coverage of the cost (i.e. investment and operational costs). This policy allows for possible cross-subsidization between profitable (urban) and non-profitable (rural) areas, but without subsidies to the sector as a whole.

Because of its heavy reliance on imports, telecommunications has benefitted from the "over-evaluation" of local currencies in several countries and will be heavily affected by substantial increases in the costs of foreign exchange.

The 1980's has been a period of heavy investments in expansion and modernization of the telecommunications network in the region. As a result of this expansion, in combination with severe manpower and in some countries foreign exchange constraints, the capacity to operate and maintain the networks is now a major concern in several countries. During the same period there have been rapid changes in the technology used. This has dramatically improved the communications system in the region. Much of this expansion has been funded by donors, and implemented by foreign companies, as has been the case with the NORAD/SIDA funded projects.

The operation and maintenance of this expanded network is now a major challenge to the telecommunications authorities in the countries, but should also be of concern to the donors who have been involved in the expansion of the systems. This requires a strengthening of these telecommunications administrations, and more particularly their operations and maintenance functions, the latter both in terms of manpower and status within the institutions. Manpower and organizational development will therefore in the future be equally important issues in the development of the sector.

Both in Zimbabwe and Zambia, the PTCs have experienced a

loss of qualified and experienced manpower during the 1980's, which in some respects have actually reduced their capacities.

The NORAD assistance has already to some extent moved in this direction, through the second phase of REG 020 in Zambia, and REG 043 in Zimbabwe.

An analysis of the manpower situation in the sector, and the preparation of both a regional strategy and national strategies for manpower development is one of the most urgent tasks, including the development and coordination of training facilities within the region.

A major part of the Norwegian assistance to telecommunications in the SADCC region has been to international radio links forwarded for funding through SADCC, and funded from MDC's special grant for regional projects.

The radio links are, together with other types of international transport and communications, the most easily identifiable projects with a regional impact. This to a large extent explains the prevalence of such projects in the early years of the SADCC cooperation. So far it is perhaps also the area in which the SADCC cooperation has accomplished the best results. Without the SADCC cooperation, and the backing to this cooperation by donors like NORAD, some of the links would have taken much longer time to be realized.

As discussed in Chapters 9 and 10 (Main Report), there has been a tendency to move from an initial investment project orientation, gradually towards more concern for operation, maintenance and institutional support to the national telecommunications administrations. This touches a wider issue of the relationship between SADCC and the member countries, and, from the donor's perspective, the relationship between regional and bilateral assistance.

For SADCC, there is a need to focus more on clarifying the regional dimension in systems operation, e.g. the role of regional repair facilities and regional training facilities, and also define more clearly the criteria for "regionality" for a project/activity.

Today, Norway supports the Zambian and Zimbabwean PTCs with personnel, with funds allocated from the regional SADCC grant. This way of using the regional funds may have been a practical way for MDC and the recipient countries to find money for necessary follow-up of regional investment projects, for which it may

not have been possible to find bilateral funding. However, the projects are for all purposes bilateral. The personnel is not working particularly with the maintenance of the international links or training with a regional orientation. MDC should therefore consider if it is natural to continue funding them from the regional grant. This is probably an issue which is of relevance not only for telecommunications projects, but also in other sectors.

On the basis of both the experiences from the evaluated projects, and a general assessment of the sector in the SADCC countries visited, the Team would outline five main options for further Norwegian assistance to telecommunications in the SADCC region. The options represent broad directions of future assistance rather than specific interventions.

The options are:

**1) Support to new microwave links, to complete the terrestrial PANAFTEL network.**

*The major part of past assistance has been to such links, and the experience with the Norwegian equipment and the Norwegian company has in general been to the satisfaction of the recipient countries.*

*There are still "missing links" in the PANAFTEL network, and some of these links are natural continuation of past Norwegian assistance. This applies in particular to the link Zambia-Angola, which is a continuation of REG 020, and the link Botswana- Namibia, once Namibia becomes independent, which is a continuation of the present commercial assistance to Botswana. Particularly the connection of an independent Namibia to the SADCC region, without transit through RSA, would seem to be a natural continuation of the past Norwegian support to both telecommunications and Namibia's struggle for independence.*

*Experience from Zambia and Zimbabwe indicates that support to investment projects of this type, easily leads to a broader involvement with the national telecommu-*

*nications administrations, and a need to continue with other types of assistance. As part of the assessment of possible future investment projects, there is also a need for a realistic assessment of the capacities of these administrations, and the likely future needs for assistance to secure the operation and maintenance of the links.*

**2) Support to regional training and repair facilities.**

*The individual SADCC countries have too limited requirements for specialized manpower, both technical and managerial, to justify the establishment of advanced national training institutions. As a whole, the training needs in the SADCC region may be sufficient for the establishment of regional training facilities, rather than relying on overseas training. The same argument applies for repair facilities, since the market in the individual countries may be too limited.*

*The establishment of regional institutions, both for training and repairs, requires careful planning to identify the needs and in order to agree on how and where the needs should be met. It also requires clarification of responsibilities with respect to the operation of such regional institutions, and a strong commitment from the individual countries (where the facility is not located) to make use of the facilities. For training, the language problem may be a problem when including Mozambique and Angola in such arrangements.*

*From NORAD's perspective, this would have the advantage of continuing the regional perspective of the telecommunications assistance, while at the same time orienting it more towards operation and maintenance.*

**3) Support to the national telecommunications administrations to strengthen their capacity to operate and maintain the existing networks.**

*The SADCC countries have implemented ambitious*

*investment programmes, leading to rapid expansion of their telecommunications networks during the 1980's. Generally, the development of the organizations and their capacities to operate and maintain the expanded networks, have not kept pace with the system expansion. This applies particularly in the field of manpower development, but also development of maintenance routines, and strengthening of the organizations in the field of maintenance. The economic situation in some of the countries, with an acute scarcity of foreign exchange for necessary imports, also makes the import of spares, vehicles for maintaining the vast networks etc. a major constraint.*

*Depending on the specific situation in the country, there is a need for import support to spares, for support to training and manpower development, for technical assistance and management support particularly in the field of maintenance.*

*Such assistance should be based on a broad assessment of the organizations in question, based on a perspective of institution building and should be integrated parts of plans for organizational development supported by the organizations themselves. This requires a much closer dialogue with both the telecommunications administrations and their parent ministries than has so far been the case, and a more active, and thus demanding, role for NORAD, both during planning and follow-up of the assistance. It also implies a continuation of the process of "bilateralization" of the telecommunications support, and may raise the question of use of bilateral rather than regional funds.*

#### **4) Support to the development of rural telecommunications.**

*The countries, with the exception of Mozambique, have or will shortly have a telecommunications network covering most of the countries down to the level of district headquarters. This is a necessary precondition*

*for a future development of a rural telecommunication system. Development of rural communications is a priority area, and some countries are preparing more elaborate strategies for this development, including technological options and strategies for funding. This strategy implies a further expansion of the telecommunications networks, into more remote areas, and thus a further addition to the already existing maintenance problems. Since rural telecommunications normally need to be subsidised, it will also influence the financial position of the sector as a whole.*

*Development of rural telecommunications can be primarily oriented towards high potential areas for commercial production (commercial farmers and other producers), able to pay quite high costs for installation and operation of a network. This seems to be the strategy in Zambia. It can also be more oriented towards rural service institutions like health centres, payphones in rural areas etc., which would mean users less able to pay the costs of the system, and thus more need for subsidies.*

*An advantage for NORAD with this option is that it makes it easier to orient the support towards poorer sections of the societies. Such an orientation would, however, need subsidies.*

*This option also implies a more bilateral orientation of the support, and it would be difficult to maintain the present pattern of funding from the SADCC grant. It would therefore require that NORAD and the recipient countries agree on including the telecommunications sector under the bilateral country programmes.*

*Assistance to rural telecommunications requires a careful analysis of the relationship between telecommunications and other sectors in the area in question. To realize the potential benefits from telecommunications, there will often be a need for supplementary assistance to other sectors. This option can therefore best be con-*



*sidered in areas where NORAD is involved in other sectors, e.g. through integrated rural development programmes, or in cooperation with other donors involved in rural development in the area.*

*Because of the need for a more multisectorial approach, the option should, if considered relevant, preferably be implemented on a pilot basis. As for option 3) it will require a stronger involvement from NORAD in project planning and implementation, more so since there are no experienced Norwegian companies, with an experience similar to EB NERA's for microwave links, to rely upon. It is also uncertain if the pattern of using Norwegian equipment will be possible with this option.*

**5) Support to capacity adjustment in the existing national networks.**

*Unbalance in capacity in the networks may represent serious bottlenecks, implying very bad utilization of the systems. Selective investments with respect to capacity adjustment are likely to have huge immediate effects on overall system performance.*

*Capacity adjustments may be needed with respect to links and exchanges, both main and local exchanges.*

Having outlined the options, there is a need also to develop criteria for prioritizing between the options. The priorities will have to depend upon the policy guidelines outlined in Chapter 14.1 in the Main Report, and take into account the differences between the countries.

On the basis of the analysis of the situation in the SADCC countries presented in the present evaluation, the Team would generally recommend that priority is given to option 2 and 3, i.e. assistance aimed at strengthening the national telecommunications administrations' capacity to operate and maintain the existing network.

Two main factors support this conclusion:

*\* the rapid system expansion during the last decade,*

*and the absence of a parallel development of the institutional capacities*

- \* the critical economic situation in several SADCC countries, and the general policy in these countries of giving priority to rehabilitation and maintenance of existing infrastructure as part of the economic recovery programmes.*

Thus both the situation within the sector, and the general situation in the countries support the conclusion.

Regional and bilateral assistance could be used in a complementary manner in a strategy for creating a more sustainable telecommunication network. Such a strategy would, however, require a stronger involvement from NORAD, and in particular the NORAD representations in the respective countries, both in the sector in general and in the individual projects.

The above conclusions and recommendations seem to be the most relevant ones in a short run context. To increase the countries capacity to plan and run their telecommunications systems projects is vital before, or at least along with further expansion of the networks. In a longer perspective, however, option 1, 4 and 5 should also be considered.

The strategy should also take into account the contributions from other donor countries in order that different projects supplement each other.

**TERMS OF REFERENCE FOR EVALUATION****REG 403 - TELECOMMUNICATIONS INFRASTRUCTURE****OCTOBER 4TH, 1988****1.00 BACKGROUND**

The telecommunications infrastructure is a relatively new sector in the MDC's development assistance programmes, but in financial terms it has had a rapid growth over the last 7 - 8 years with a total investment of NOK 700 million. Whilst some 30 % of these funds have been channelled through the Department of Industrial and Commercial Cooperation, the remaining 470 million have been given as grants to projects for which NORAD's Project Department also has been responsible for planning and implementation in cooperation with both Norwegian and Swedish telecommunications companies. Such companies have over the years gained considerable experience in developing countries, and completed projects are generally considered successful.

It is, however, also recognized that the introduction of high-technology infrastructure in developing countries require careful planning and coordination, and MDC will now carry out an independent evaluation of achievements and impacts of the Norwegian development assistance to this field.

**2.00 OBJECTIVES**

The objectives of the evaluation are:

- to undertake a general policy study of aid-financed projects/programmes in the telecommunications sector;
- to evaluate a number of selected Norwegian supported telecommunications projects/programmes in Africa; all to be used by the MDC in planning of programmes and support within this sector in the future.

**3.00 SCOPE OF WORK**

The evaluation shall cover the following two main sections:

- a) A general sector policy analysis, and
- b) a review of the MDC's sector support.

The review shall be based on a comprehensive evaluation on 3 - 5 completed projects in the SADCC region of Africa.

Note: The MDC reserves the right to review and modify the specifications of service given below. Such modifications shall, however, only take place in between the two phases of the programme (see 4.20).

**3.10 Sector Policy Analysis (Phase I)**

The section shall include, but not necessarily be limited to, the following sub-themes:

- i) A general review of international development policies in the telecommunications sector. (Ref ITU/OECD studies)
- ii) An analysis of the role of telecommunications in the overall socio-economic and socio-cultural development in the developing world.
- iii) An assessment of the compatibility between the sector policies and the principle objectives of the Norwegian development assistance.
- iv) A general overview of the sector investment and other assistance inputs provided by the MDC over the past 8 years.

**3.20 Sector Support Evaluation (Phase II)****3.21 Preparations:**

The preparations for sector for sector support evaluation will be carried out in close cooperation with NORAD's project personnel. The work will include, but not necessarily be limited to:

- i) Selection of projects;
- ii) compilation of projects documents;
- iii) desk studies of project documents (for definition of planning models, targets, target indicators, special problem areas etc.);
- iv) review of TOR for phase II as seen in the light of the project information;
- v) planning of the field studies.

**3.22 Implementation:**

The implementation team will evaluate the projects' activities and achievements in relation to goals, production targets and inputs, as these are stated in project plans and other documents.

The evaluation will address the following aspects:

- i) The impact of projects on socio-economic, regional, and local/rural levels. Possible implications of such development to gender related conditions (distribution of labour etc.), as well as the environmental impact of the projects will also be discussed.

ii) Conformity of the projects to existing telecommunications services within the sector, and coordination with the recipient governments' own development activities.

iii) Adequacy of internal organization and management of telecommunications, institutional and administrative procedures, communications between local authorities and project personnel, training of local staff, and progress towards full responsibility by local institutions and personnel for continued operation and maintenance of the projects.

iv) Constraints and problems having affected and/or presently affecting the development of telecommunications in the region in question, e.g. financial situation (local funds, foreign exchange etc.), choice of technology (analogue, digital, satellite, fiberoptics), technology transfer (training, technical assistance etc.).

v) Any other matter relevant to the framing of conclusions and recommendations for future assistance.

### **3.30 Recommendations**

On the basis of the Sector Policy Analysis and the Sector Support Evaluation, the Consultants shall discuss options for future Norwegian development assistance in the telecommunications sector, and analyse pros and contras to alternative forms of assistance, such as project support, management, training, institution building and technical assistance.

## **4.00 WORK PLAN**

### **4.10 Premises**

The implementation of the evaluation will include comprehensive desk studies as well as field studies. The desk studies will be based on available information, such as project documents (feasibility reports, appraisals etc.), research reports by international organizations (e.g. ITU, OECD), and interviews with MDC/NORAD staff and other resource persons.

The field studies include visits to the recipient countries and discussions with local authorities at central and district level, beneficiaries and users, local staff and trainees, project staff etc.

### **4.20 Work Programme**

Phase I will be based on desk studies only and conclude in an Inception Report containing the following documentation:

i) Sector Policy Analysis (3.10) - draft.

ii) List of selected projects with brief descriptions of project components and identification of aspects of special relevance to the evaluation objectives.

- iii) Review the TOR for Phase II.
- iv) Detailed plan for the field studies.
- v) Outline the format of the final report.

Phase II shall not commence until the MDC/Norad's comments on the Inception Report are available and the proposed work programme, budget, etc. are approved. (time required for the MDC's administration of the inter-section activities is estimated to 6 weeks.)

#### **4.30 Time frames**

The resource requirements and timing for presentation of reports etc. will be stipulated in the Consultancy Agreement.

#### **4.40 Implementation Team**

The evaluation project, depending on an acceptable proposal and agreement, will be commissioned to the Centre for Studies of Development and Technology Transfer (CDT). The Team shall comprise 3-5 resource persons, together covering the following disciplines:

- a) Telecommunications engineering, economy and social science; and special experience.
- b) Relevant working experience from Africa, knowledge of development assistance cooperation, and project management experience.

The MDC's policies regarding women's participation in work teams, committees etc. shall be observed.

CDT shall coordinate the activities and the recruitment of staff with the other evaluation studies REG 404 and LES 401. The total number of staff shall be limited to the extent possible.

#### **4.50 Language**

All reports and documentation shall be presented in English.



