

**KomTech-Institute
Solingen**

**Evaluation Report
Cape Verde Inter-Island Sea Cable
Project No. 1672/94**

Final Report

Post Completion and Impact Evaluation

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**This evaluation was requested by:
Bundesministerium für auswärtige Angelegenheiten, Vienna, Austria**

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Only the authors are responsible for the content of this report.

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Curiculi Vitae

Daily Report KomTech-Institute

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Terms of Reference (German version)

Contrato de Concessão do Serviço Público de Telecomunicações

O. Executive Summary

The Cape Verde Inter-Island Sea Cable is an Austrian development aid project.

Discussions began in 1992 and resulted in a contract between Austria and Cape Verde on 7 December 1995. The objective of the project was to ensure an extensive infrastructural modernisation of telecommunications on the island republic, bringing it up to the latest technological standards. Siemens AG was commissioned to lay the inter-island sea cable. Between 1996 and 1997 the islands Sao Vicente, Sao Nicolau, Sal, Boa Vista and Santiago were linked by fibre glass sea cables. In 1998, the successfully completed project, managed by the meantime privatised company Cabo Verde Telecom (CVTelecom), was put into operation as planned and on time. The project funding was mixed: the OPEC Fund provided a loan of US\$ 3 m., Austria provided development aid amounting to US\$ 7 m., and Cape Verde provided US\$ 3 m. With its operational profit, CVTelecom financed a further sea cable between the island of Santiago and Sao Vicente in a second stage. This second cable cost approx. US\$ 6 m. It went into operation in 2002.

Also in 2002, the Federal Ministry of Foreign Affairs in Vienna commissioned the KomTech-Institute in Solingen to carry out an ex-post and impact evaluation. On the basis of an in-depth study of the documentation, general discussions with experts, special discussions with experts on Cape Verde, and a survey of approx. 100 potential telephone users on different Cape Verde islands, two main findings were made:

- o From a technical, economic and telecommunications point of view, the Cape Verde Inter-Island Sea Cable Project has been a formidable success. In the meantime, Cape Verde has a well-functioning telecommunications infrastructure, the standard of which is above that in comparable developing countries.

- o At the same time it must be stated that the specific objectives of public development aid projects (dismantling of social inequity, promotion of women, promotion of health and education, etc.) were not (or only indirectly) achieved through this project.

Our recommendations to the Federal Ministry of Foreign Affairs for the future pertain to four focal points in the telecommunications sector:

- o Telecommunications/social and cultural consequences in developing countries should be systematised into a single field and given due study.

- o Development aid projects to facilitate communications in the medical sector should be initiated on Cape Verde.

- o Telecommunications on Cape Verde exhibit a number of gender-specific peculiarities. Projects are recommended for the promotion of women (courses on gender issues, scholarships for women engineers and computer scientists, facilitation of access to telecommunications for rural women).

- o Support should be given to strengthen the telecommunications regulatory agency on Cape Verde.

1) Summary of the Conclusions and Recommendations

1. Gender

In order to ensure the appropriateness of such large technological projects in the future, a coherent integration of the social and cultural dimensions of the technology transfer should be dealt with from the very start of any such a project. Especially with regard to the male-dominated area of technology policy, the gender aspect is of utmost relevance in order not to increase existing disparities.

According to the guidelines for mainstreaming the gender approach (Austrian Development Cooperation 1998) such a proposal could mean, for example:

- gender awareness training in the institutions concerned,
- discussions over ways to ensure the access of poor rural women to basic telephone services and
- special grants and scholarships for female engineering/ informatics students.

2. Strengthening Socially Weak Groups

The expansion of telecommunications is a measure aimed at supporting a world market- orientated economic policy, especially in sectors such as tourism or “free production zones”. This policy, however, can also have negative consequences, especially when it comes to gender aspects, e.g. the over-exploitation of the (mostly female) workers in such zones, or prostitution in tourist areas.

We recommend that groups and institutions opposing these tendencies and assisting the affected persons should be supported.

3. Public Access

One of our many findings is that telecommunication tariffs and contract conditions (especially with regard to mobile phones) discriminate against target groups (socially underprivileged people and public institutions) who are of high importance in any development aid policy.

In order to remedy such grievances, a well-designed initiative by a state regulatory agency would be necessary. As a state agency, such an institution would be in the position to initiate socially relevant projects.

It is precisely in this context that we recommend a much better and cheaper access for hospitals to the telecommunications network. Without any additional costs for CVTelecom, it would be possible to offer hospitals, schools or other educational facilities fixed lines.

4. Reducing Prices

Binding social indicators for the price of telecommunications services in developing countries have not been internationally established. Currently, the German Federal

Statistics Office's basket of goods apportions 2-3% of the monthly expenditure of an average household to transmission of news (postage, telephone, Internet). Compared with the regular income on the Cape Verde islands, the proportion for an average household must be much higher.

We strongly recommend an adjustment of telecommunication tariffs to national wages, i.e., in the case of CVTelecom, lowering the prices. This could possibly increase the countrywide demand for telecommunications. At the same time, CVTelecom should consider longer validity periods for the prepaid contracts for mobiles, e.g., for single mothers. Any "dead" mobile which cannot be used because the prepaid contract has not been extended, does not stimulate business as incoming calls cannot be responded to.

5. Legal Re-examination of the PIC 1993-95

The authors of the recently published *Cape Verde Internet Case Study* for the International Telecommunication Union (ITU) argue that the necessary regulative of the present situation is market liberalisation, i.e., the abolition of the absolute monopoly of CVTelecom for all telecommunication services. Perhaps this demand cannot be met because of a clause in the Memorandum of Understanding of the PIC 1993-1995, where one can find the following paragraph: "The Government [...] shall not provide licenses to bypass operators".

We recommend a legal re-examination of the Memorandum of Understanding of the PIC 1993-1995.

6. Regulatory Agency

A private-sector telecommunications market needs an independent regulatory agency. This authority not only develops and monitors the rules for the network and service providers on the market, it also has to take the public interest into account (for example, basic provision for the general public).

A development aid project aimed at strengthening such a regulatory agency on Cape Verde is to be recommended.

7. Project Objectives

This project came into being for the following reasons:

- Strong export market interests of Siemens Austria AG supported by different Austrian Government officials,
- Interest of Austrian Government officials in the development aid field for which Cape Verde is one of the nine Austrian focus countries in the Third World,
- Interest of the Cape Verdean Government in drastically improving its hitherto poor telecommunications performance.

Because of the heterogeneity of these three different interests, there was never any clear project aim. Nor was it clear whether the first aim was export support or development aid.

For future projects we recommend a much more transparent, open, precise and operational-focused discussion of the project aims.

8. Competitive Offers

From the very beginning of the project, the bidding and competition process between Siemens AG and other possible industrial suppliers for sea cable technology was not a very open one. Had offers by for example Alcatel been taken more seriously, it certainly would have been possible to reduce the overall price by a margin of 10-15%.

For future projects we strongly recommend an open and fair bidding process.

9. Avoiding Conflicts of Interests

The relationship between the Austrian Government and the Austrian consultancy company Austroconsult remains strange and difficult to judge: Who chose at which time and for which reasons Austroconsult to do a feasibility study, to select the supplier, and later to also take care of the technical control of the overall project and even sign its final acceptance vis à vis the Cape Verdean Government?

We recommend that in future projects, one of many project partners should be given one project role only and not two, as one of the two or more roles might result in a conflict of interest with the other role.

2) Introduction

a) *Background (context, history and logic of the project)*

In the English language of the early 20th century the term “communication” still had a very broad meaning. It meant railways, ships, as well as wireless telegraphy and telephony. Because of their geographical location, islands like Madeira or Cape Verde were always of utmost importance for international communications, be it as harbours or as links for telegraph cables. In the last third of the 19th century Cape Verde was at the centre of a lot of telegraph cable activities connecting the UK, Portugal and Brazil. The first telegraph cable connecting Cape Verde with other countries was laid in 1874 by the British company Western Telegraph (a predecessor company of Cable & Wireless) and linked in Mindelo on the island of Sao Vicente. In 1975 a celebratory tower was built in Mindelo in commemoration of this 100-year-old cable.



Book Cover from the late 19th Century

When the Inter-Island Sea Cable Telecommunications Project was conceived in the beginning of the nineties, it was influenced by the essential technological change of the time: the global telecommunications system’s digitalisation was reaching even the poor and remote periphery, and everywhere, national PTT administrations had to deal with the cost-intensive need for modernization.

At that point various interests coincided:

- Strong export market interests of Siemens Austria AG supported by different Austrian Government officials,
- interests of Austrian Government officials in the development aid field for whom Cape Verde is one of the eight focus countries in the Third World,
- interest of the Cape Verdean Government to drastically improve its hitherto poor telecommunication performance.

The evaluation team was unable to detect which was the strongest power in this triangle of different and sometimes even divergent interests.

b) Short Description of the Project

The sea-cable project was part of a complete modernisation project for Cape Verdean telecommunications, with an estimated volume of US\$ 30 m. In this context, the inter-island connection was given first priority. From the start in 1992, there seemed to be a preference for Siemens AG as the supplier of the equipment (then foreseen: digital microwave transmission). The first financial request to the Austrian authorities was for US\$ 9 m. The initial reaction of the Austrian Federal Ministry of Foreign Affairs (FMFA) was positive, namely, to grant an interest-free loan with a long maturity. Furthermore, there was a plan to integrate the local telephone network in Austria's main project region, Sta. Cruz, into the overall modernisation of the telecommunications infrastructure.

Simultaneously, the Cape Verdean authorities had asked the German telecommunications consultancy Detecon (a daughter company of Deutsche Telekom AG) for a feasibility study on the modernisation of the infrastructure of the Public Enterprise of Postal Service and Telecommunications CTT-EP. Resulting recommendations were: to use sea cable instead of radio microwave technology for the inter-island trunk network, and to assign one more consultant for the precise planning of the modernisation.

In the same year, an Austrian consultant was sent to Cape Verde. The responsibilities of Austroconsult were extended to include the supervision of the whole implementation process of the project.

In the "Accord sur le Programme Indicatif de Cooperation (PIC)" of February 1993 the formerly proposed loan was changed into a grant. There was no explanation found for such a rather unusual procedure in the context of telecommunications projects. Still based on microwave technology, the Austrian financial participation was fixed at US\$ 3.8 m., but it was recommended that the pros and cons of sea-cable technology should be examined.

The Austroconsult report of June 1993 confirmed the Detecon recommendation for cable technology, emphasising the availability of an Austrian supplier. But the estimated costs were much higher for cable, at US\$13 m, than for microwave technology, at US\$5 m. Therefore the financing showed a difference of US\$ 8 m. which could not be covered by supplier credits because of unacceptable interest rates.

During a visit to Vienna in February 1994, a Cape Verdean delegation (Ministry of Foreign Affairs, DG for International Cooperation; Ministry of Finance, DG of Public Finance; CTT-EP) proposed to fill this gap with a credit from the OPEC Fund and an increase in the Austrian contribution, from US\$ 3.8 to US\$ 5.8 m. The Austrian side insisted on financing this additional support through reallocation within the PIC 1993-1995.

In November 1995 the "Agreement between the FMFA Austria and the Government of Cape Verde (...) on the Financing of the Inter-Island Sea Cable Telecommunications Project" was signed. Before signing the contract, namely in February 1994, the public CTT-EP had already been separated into two independent enterprises. The

telecommunications enterprise Cape Verde Telecom (CVTelecom) had already been privatised in June/July 1995. The recipient of the grant of US\$ 5.8 m. was the Cape Verdean Ministry of Economic Coordination. The respective law designates that the telecommunications infrastructure remains the property of the Government and is operated by the licensed public service operator.

In 1998 Austroconsult certified the final acceptance of the contracted works by Siemens Austria. Santiago, Boa Vista, Sal, Sao Nicolau and Sao Vicente were connected via fibre-optic sea cable (green line).



In March 2002 the “ring” was closed by a second project (red line), self-financed by CVTelecom (see 4d). Any cable damage will now no longer result in reduced transmission capacity via a satellite or a loss of traffic because the signals are re-routed via the other leg of the ring.

Today CVTelecom is a successful private telecommunications company as the enterprise's revenues show (Table 3).

c) Changes in the Project during the Negotiations and its Implementation

During the initial phase of this project, there were several profound changes in the process of its negotiation and implementation:

1. The change from a loan to a grant contribution.
2. The change from radio microwave to fibre-optic sea cable technology.
3. The increase in the Austrian contribution from US\$ 3.8 m. to US\$ 5.8 m.
4. The change of the executing agency from the state agency CTT-EP to the private joint stock company CVTelecom.

d) Evaluation Method (general approach, information sources, investigation tools, profile of the evaluation team, coverage of the investigation and its limitations)

There was a wide range of very different sources of information for this investigation: a selection of official and semi-official documents from FMFA in Vienna, interviews and talks with different Austrian Government officials, documents, interviews and talks at the Cabo Verde Telecom (CVTelecom) headquarters in Praia, interviews and talks with several expert telecommunications users at different locations in Cape Verde, opinion research among 100 potential telephone users, expert interviews with ITU officials at the headquarters of the International Telecommunication Union (ITU) in Geneva, evaluation of scholarly literature and data resources from the Internet.

The investigations in Cape Verde were influenced by the narrow time frame (ten days), so that some limitations had to be taken into account. Although the colleagues from the Coordination Office of the Austrian Cooperation in Praia did everything possible to organise the meetings for the evaluation team, a few appointments could not be realised. Furthermore, there were difficulties in getting actual economic data from the National Statistics Institute. We were even told that all data after 1998 are estimates only.

In our field study with potential telephone users it was not possible to reach a strictly defined representative sample. But we did our best to approximate to average values: we had interviews with 50 women and 50 men, 41 people from the biggest and most populated island Santiago, 20 from the tourist centre Sal and the volcanic island Fogo, and 19 from the cultural centre in Mindelo on S. Vicente. We chose people from 15 to 72, achieving an average age 33.5. Unfortunately, there is a small urban bias in our sample. Nevertheless, the answers show the relationship of the Cape Verdeans to their telecommunications infrastructure in a relatively appropriate way.

The evaluation team consisted of Professor Dr. Jörg Becker and Christine Höbermann, M.A., from KomTech Institute (www.komtech.org) and as the technical expert, Dr. Clemens Unger from the Norddeutsche Seekabel Werke (NSW) (www.nsw.com). Professor Becker is an expert in the area of communication and development (mass media, telecommunications and information technologies). He had the overall responsibility for the evaluation report. Christine Höbermann is an expert on the social impact of telecommunications in Third World countries. In this project she conceptualised and carried out the field study (user study) in ten different locations in Cape Verde. Her responsibility was also the analysis of the documents from the FMFA, the preparation of interviews and design of questionnaires for the investigations in Cape Verde, the expert meetings in Cape Verde, the data collection and processing of the field study, the organization of the local investigation team, and the elaboration of the presentations of both the preliminary and the final report. Dr. Clemens Unger is a graduate engineer who works worldwide as a manager for the cable company NSW, now owned by Corning Incorporated. He worked closely with the CVTelecom engineers, analysed the technical and economic documentation of the sea cable project at CVTelecom, participated in various expert meetings, took

numerous photographs and prepared the presentation of the preliminary report in Praia.

e) Structure of the Report/Terms of Reference

The Report is structured according to the quality criteria of the Austrian Development Cooperation. The strict orientation around the Terms of Reference (ToR) of the Preliminary Report presented in Vienna on 11 February 2003 was criticised and replaced in favour of a more compact, analytical statement on the respective criteria. The particular ToR have the following structure:

Terms of Reference

1. Coherence

- Were cross sectoral priorities considered in the conception of the project?
- Did the project lead to savings in other important sectors of Austrian Development cooperation with Cape Verde?

2. Relevance of the Project

- Did the project correspond to Cape Verdean priorities at the time of the Austrian promise?
- Was the expansion of telecommunications the express goal of development aid for Cape Verde?
- Did the telecommunications project correspond to the need and presumed interests (better health service, better educational opportunities, better access to jobs, etc.) of the rural population in the integrated islands?
- Has the revenue of CTT-EP, due to the implementation of the sponsored system, been increased significantly, as expected? What portion of these CTT-EP revenues consists of proceeds from the international and the national network? Are non-profitable parts of the network (rural and public telephony) cross-financed with the income of other profitable units?
- Are further extensions of the telephone network planned by the Cape Verde government or CVTelecom?

3. Participation

- To what degree were Cape Verdean interests taken into consideration when the principal choice for sea-cable technology was made?
- Were demand studies made before the start of the project?
- Which user groups can afford access to telecommunications? How is the tariff structure of CVTelecom organised? Does the tariff schedule permit the transfer of the Austrian contribution to important target groups (women, sick people)?

4. Impact

- Are there positive impacts of the telecommunications net on the overall economic performance of the country?
- Which population groups have got the majority of the newly installed connections since (approximately) 1997 and where are they located?
- In the opinion of the responsible CVTelecom managers, could the goals of the project be achieved? How is the capability of the network assessed?
- Could new qualified jobs be created by the expansion of the total network by CVTelecom (comparison 1995 - 2002)?
- Are the above named target groups (women, micro enterprises (MPME), people in need of education or health services and the rural population) preferentially integrated into the network?
- Are the social, economic, cultural or political effects, which can be brought about causally in context with the building of the telephone network, detectable?
- Do the above mentioned target groups know about the possibility of access to telecommunications? Which factors facilitate or obstruct their access?
- Could the Austrian Development Cooperation enhance the efficiency of project communications (especially in Sta. Cruz)? Could the Austrian Development Cooperation make use of the experiences in co-financing?

5. Sustainability

- Was the original assumption of the practical maintenance-free use of the submarine cables confirmed? Is CVTelecom in the position, on the basis of the introduced tariff structure, to guarantee a professional maintenance of the cable network without neglecting the remaining facilities revenues?
- Are statistics and records available of the (annually) accruing maintenance costs of the cable business and CV Telecom's share of the total costs?
- Is the lifetime of the network (originally 40 years) still realistic on the basis of the previous experience?
- What are the most frequent causes of failure? Had the operators already considered these causes before deciding on the technology?
- Does the chosen technology comply with the conditions and needs on Cape Verde to the anticipated extent?
- Will the required repairs be carried out exclusively by PTT-EP's Cape Verde experts, or is the supplier (as the case may be) involved in these (percentage)?
- Has the participation of the Austrian enterprises (Austroconsult, Siemens) resulted positively in sustainability? Were "new economic partnerships" created?
- Could Cape Verde provide its share of the implementation costs of the project as foreseen during planning?
- How does PTT-EP assess the payback of the OPEC loan?

6. Efficiency

- Does the actual network and the chosen technology justify the total expense of more than ATS 140 m.? Was there freedom of choice for Cape Verde in the course of the bidding?
- Does the decision for cable technology in 1994 measure up to up-to-date technical know-how?

3) Coherence

In order to assess the coherence of the project, the project planners were asked about the extent to which the respective focal points were considered. It also had to be clarified whether the project led to savings in other focal points of the cooperation effort.

a) Central Priorities of the Austrian Development Cooperation

As for the coherence between this inter-island sea cable project and the general central priorities of the Austrian Development Cooperation (explicitly: environmental and gender issues, good governance and poverty reduction), it is clear that these priorities are scarcely present in early project documents.

They are mentioned in several documents, but in the subsequent communication with the project partners there are no more references to the priorities. Any step or concretisation towards assuring their consideration in the project's implementation is missing. The realisation of the requested effects on health services, education and unemployment is neither defined in any way in specific measures, nor are any benchmarks set.

The conditions set for the grant from the Austrian Government were: the prevention of teleports (in this context: international voice telephony through the Internet), the ban on licenses to any competitors (!), the security of basic rural and urban telephone service in the case of privatisation, the support of the Austrian consultancy, the provision of local works as CVTelecom's responsibility, and the improvement of the bill-collecting system. No further social aspects were integrated, either regarding the specific provision of the basic telephone service, or the utilisation of revenues for gender, health, education or employment issues.

In addition, the dispensed consultancy was limited to economic and technical aspects, and hence excluded from the verification of developmental, cross-sectoral priorities of gender and environmental issues, or even health, unemployment and education.

As a possible explanation for this deficit, one can argue that although the above mentioned priorities were already essential criteria for the FMFA, they had not yet been implemented in administrative measures at the beginning of the Cape Verde Inter-Island Sea Cable Project (cf. for example, the environmental impact assessment or the gender check list since 1997). Another important aspect is the process of restructuring Austrian cooperation, which was taking place at the time.

b) Reduction of Resources in Other Important Sectors of the Austrian Development Cooperation

With regard to the possibility of a reduction of resources in other important sectors of Austrian Development cooperation with Cape Verde, it has to be taken into account

that the amount of Official Development Assistance (ODA) to Cape Verde in the period 1994 to 1998, when the sea-cable grant was disbursed, significantly increased:

Table 1: Official Development Assistance (ODA) Austria/Cape Verde 1990 – 1999 (in M ATS)

| | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 |
|----------------|------|-------|-------|-------|--------|-------|-------|-------|-------|-------|
| ODA | 39.3 | 31.80 | 36.9 | 28.2 | 66.4 | 64.87 | 40.17 | 58.82 | 47.86 | 36.57 |
| Communications | 0 | 0 | 0.25 | 1.07 | 4.35* | 28.52 | 15.9 | 21.12 | 4.33 | 0 |
| Others | 39.3 | 31.80 | 36.65 | 27.13 | 62.05* | 36.35 | 24.27 | 37.7 | 43.53 | 36.57 |

Source: FMFA; Note: There are statistical incoherencies in the different documents for this table. Furthermore, the data for 1994 is not precise as we do not have any sectoral figures for that year.

Regarding the allocation of these resources to different sectors (Table 2), there is some lack of clarity because of structural changes in the sectoral criteria in the documents, due to organisational changes in the FMFA (see below). But after the careful merging of some categories, the statistics show that the considerable increase in communication sector support (in 1995 44% of total ODA) most probably would have reduced the quota of energy and multi-sector projects (in 1993: 17.14% + 34.33% = 51.47% of ODA).

Obviously the sea cable project induced or accompanied a fundamental reorganisation of the development cooperation between Austria and Cape Verde: Former regionally focused projects became sectorally structured. At the same time, the protagonists changed: Until 1993, multi-sector projects of twin-city associations dominated. After 1994, more and more consultancy agencies and technical enterprises were integrated. But even before the telecom project started, priority was given to infrastructural projects, as e.g. the energy sector shows.

Table 2: Sectoral Distribution of ODA Austria/Cape Verde 1992 – 2000 (adjusted criteria)

| | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 |
|---------------------------------|---------|---------|-------|--------|--------|--------|--------|--------|--------|
| Sectoral distribution | % ODA | % ODA | % ODA | % ODA | % ODA | % ODA | % ODA | % ODA | % ODA |
| Education, level unspecified | 6.49 % | 11.59 % | n.d. | 10.2 % | 12.5 % | 23.6 % | 13.3 % | 23.8 % | 11.2 % |
| Water supply/ river development | 7.88 % | 6.61 % | n.d. | 1.7 % | 4.5 % | 0.0 % | 15.7 % | 19.5 % | 9.8 % |
| Government and civil society | n.d. | n.d. | n.d. | 0.2 % | -0.3 % | 0.0 % | 7.3 % | 3.9 % | 47.1 % |
| Communications | 0.69 % | 3.79 % | n.d. | 44.0 % | 39.6 % | 35.9 % | 9.1 % | 0.0 % | 0.0 % |
| Energy generation and supply | 0.96 % | 17.14 % | n.d. | 10.5 % | 2.2 % | 0.0 % | 1.0 % | 0.8 % | 0.0 % |
| Industry (manufacturing) | 0.05 % | 6.68 % | n.d. | 9.3 % | 12.3 % | 5.2 % | 21.1 % | 5.6 % | 11.2 % |
| Other multi-sector | 33.17 % | 34.33 % | n.d. | 2.5 % | 2.7 % | -0.2 % | 0.0 % | -0.4 % | 0.0 % |
| Food aid | 27.67 % | 0.31 % | n.d. | 14.7 % | 22.3 % | 28.0 % | 28.0 % | 31.4 % | 17.0 % |
| Agriculture | 12.82 % | 1.09 % | n.d. | n.d. | n.d. | n.d. | n.d. | n.d. | n.d. |
| Administrative costs of donors | n.d. | 9.02 % | n.d. | 6.9 % | 4.2 % | 7.0 % | 4.4 % | 14.8 % | 3.5 % |
| Construction | 3.47 % | n.d. | n.d. | n.d. | n.d. | n.d. | n.d. | n.d. | n.d. |
| Development/ planning services | 6.50 % | 5.85 % | n.d. | n.d. | n.d. | n.d. | n.d. | n.d. | n.d. |
| Supp. to private voluntary org. | 0.01 % | n.d. | n.d. | n.d. | n.d. | n.d. | n.d. | n.d. | n.d. |
| Unspecified | 0.28 % | 3.61 % | n.d. | n.d. | n.d. | n.d. | n.d. | n.d. | n.d. |

*** No data is available in FMFA for 1994

4) Relevance of the Project

To measure the project's relevance, compliance with the Cape Verdean developmental priorities, the interests of the rural population and the income and expansion plans of CVTelecom and the Cape Verdean government must be examined.

a) Cape Verdean Developmental Priorities

Communications in general and the development of telecommunications in particular were given first priority in the Cape Verdean development strategies right from the beginning of independence in 1975.

The envisaged sea-cable project was part of a complete modernisation project for Cape Verdean telecommunications, with an overall estimated cost of US\$ 30 m. In this context, the inter-island connection was given first priority.

The relevance of the project as a crucial step for the Cape Verdean authorities towards technically improving the telecommunications infrastructure and thus increasing economic growth is beyond any doubt. Or as former coordinator Markus Repnik wrote: "That's what the Cape Verdeans wanted, and that's what they wanted from the Austrian Development Cooperation."

b) Interests of the Population

To examine the level of compliance with the *presumed interests (better health service, better educational opportunities, better access to jobs)* of the rural population, we carried out an empirical investigation on four islands, three of them integrated in the sea-cable project (annex 1). The findings of expert interviews have also been included (annex 3).

This examination was not exclusively focused on the rural population, but attempted to represent as wide a spectrum of Cape Verdean society as possible, which is 62% urban (HDR 2002). However, living conditions between city and country differ greatly, for example, only half of Cape Verdean households have electricity. According to the Cape Verde Internet Case Study, some rural communities on Cape Verde are not connected to an electricity supply or road network, but have a telephone connection.

In order to differentiate between different population groups, various categories were introduced: the islands, the degree of urbanisation of the residential area, sex, age, adherence to a professional group. The statistical significance of the differences in the replies of these sub-groups was examined. In the following, the significant differences are presented.

The connection of telecommunications with the health sector is obvious. When asked what they would do in an emergency, 22% of the people questioned in our survey spontaneously mentioned the use of the telephone or the mobile to procure a vehicle. Regarding the possibilities of getting medical advice, the telephone was not mentioned.

In an interview with the former Minister for Economic Coordination, José Thomas Veiga, it was verified that the use of telecommunications for the health service, which he mentioned in the negotiations with the Austrian authorities, was not primarily conceived for the rural area.

Clinician Emily Santos from Mindelo, Sao Vicente, pointed out the significance of telemedical diagnosis in her area. Thanks to support from a private foundation, she was able to take part in teleconferences with hospitals in Praia, Mindelo and Sal. Telecontact with Portuguese hospitals effected good results in radiography and mammography, and should also be extended to teleconferences. The problem is that the hospitals cannot afford high communication expenses.

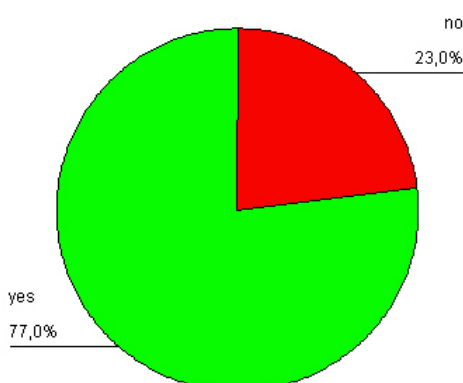
It was not possible to prove any direct impact of telephony on education. In Cape Verde, the enrolment rate in primary and secondary education is relatively high for an LDC (2001: 96%, resp. 45.8%). There is a serious bottleneck in tertiary education; most young Cape Verdeans have to go abroad for academic studies.

The potential educational impact of the Internet is being widely discussed all over the world. In Cape Verde, however, our team met only a small minority of people who reported experience in Internet usage. But 9 out of the 27 existing secondary schools in Cape Verde have access to the Internet. CVTelecom gives them a 50% discount for the Internet connection.

We were told that in the joint project of the International Telecommunications Union, CVTelecom and the Cape Verdean Telecentro Comunitario de Asomada, many students are users of the low price online offer. There is great potential for tele-education in Cape Verde (especially due to the missing tertiary education possibilities), but there is still a lack of experience in this field.

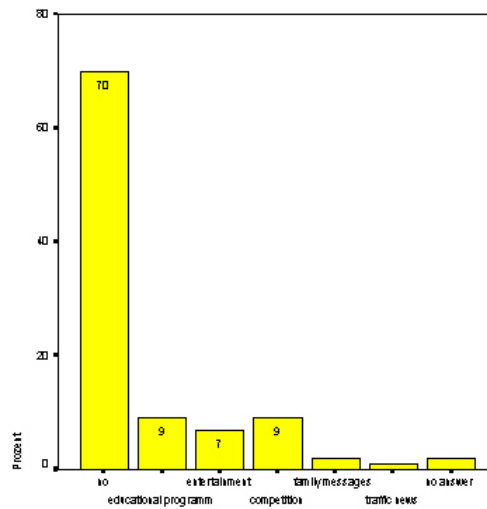
Sea-cable technology is also the infrastructure for radio and television broadcasting. A great majority of the people we interviewed knew about educational programmes in broadcasting.

Figure 1: Familiarity with the Educational Programmes on Radio and TV



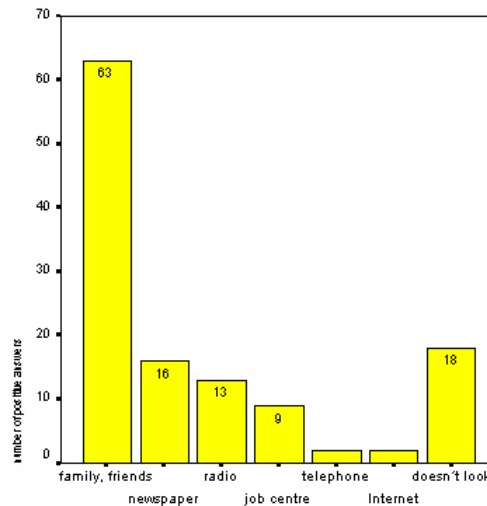
Nearly one third of the interviewees uses the telephone to participate in different radio programmes; 9% in the educational programmes:

Figure 2: Calling to Participate in Radio or TV Transmissions



A direct impact of telephone usage as a means, e.g., to speed up the labour market could not be detected in our investigation. Most of those interviewed rely on personal contacts in their search for work.

Figure 3: Ways of Looking for Work



Thus half of those interviewed knew someone who travels or has travelled to another island for training or work reasons. Significantly, on Sal it is only 15%, whereas on the other islands it is 53 to 61%. This can be explained by the fact that due to possible employment in tourism, workers migrate from the other islands to Sal but not vice versa.

The direct or indirect impact of the telecommunications system on the development of the labour market and the possibility of finding job opportunities is hard to measure, but is doubtlessly significant, especially in the growing tourism sector. It is also reported, for example, that Cape Verdeans work as “virtual security guards”, monitoring office parks in the US East Coast by webcam.

Nevertheless, reference must be made to the low degree of institutionalisation in the employment search sector, which greatly increases the importance of family contacts and friends.

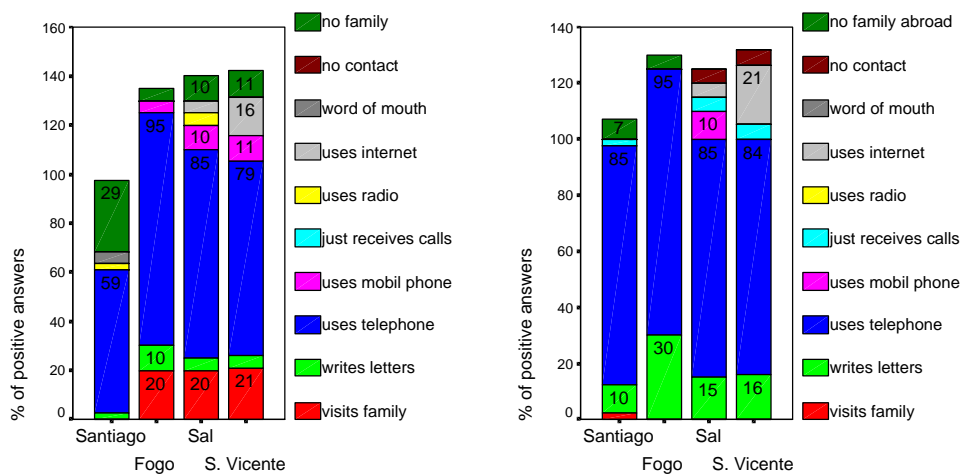
A central function of telephone communication in rural as well as in urban zones is contact with distant family members. Cape Verde is strongly marked by migration: of c. 1.1 million Cape Verdeans, 700 000 live abroad.

The telephone is the most important medium both for inter-island (75%) and for international (87%) contact. A striking fact in our sample is that more people have contacts abroad (96%) than with the other islands (82%). However, more visits are made between the islands, while from abroad, more letters (and e-mails) are written and telephone calls made.

According to sex, there are scarcely any differences, except in the use of the telephone for contacts abroad: 47% of the men, but only 40% of the women make international calls.

Between the islands there are also significant differences:

Figure 4: Inter-Island Contact/Island **Figure 5: International Contact/Island**



1. Visits between the islands: the inhabitants of Santiago are the only ones in the sample who make no visits to the other islands.
2. Telephone calls: significantly less private calls are made from Santiago to the other islands.
3. Internet: only on S. Vicente and Sal are e-mails mentioned as a national and international contact medium.

The only significant difference as regards contact between the rural and urban zones is that many more letters are written abroad from the rural areas.

As for international telephone calls, there are quite significant differences between the various professional groups: 90% of both higher-level employees and craftspeople use the telephone for their international contacts, only 84% of the unemployed, and only 50% in the informal sector.

In the 1980s telecommunication studies used to classify private communication as “not productive”. Today, when many poor countries depend to a large degree on the remittances of migrants to their homeland (Cape Verde: 20% of GNP), this classification has to be adjusted to reality: Family communication is vital, also in economic terms. In recent studies on international migration, the crucial function of these transnational family networks in the survival strategies of Third World societies is pointed out.

Although it is difficult to an extent to deduce from this user study a direct connection with the assumed interests of health, education and employment search, it does clearly indicate that for many of those interviewed the relevance of functioning telecommunications links could not be underestimated. With the support of their relatives abroad they could, under certain circumstances, also solve problems to do with health, education and employment. However, social mechanisms would have to be established for the disadvantaged minority who have no support abroad.

c) Revenue of CTT-EP resp. CVTelecom

As stated in the introduction, CTT-EP (Public Enterprise for Postal Services and Telecommunications) was divided into two enterprises in 1994. The legal successor is the privatised Cape Verde Telecom. CVTelecom is profitable, as was its predecessor.

Table 3: Evolution of CVTelecom Revenues

| Year | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 |
|-----------------------|-------------|-------------|-------------|-------------|-------------|-------------|
| Revenues, in 1 m. CVE | 2 020 | 2 456 | 2 918 | 3 538 | 4 529 | 5 213 |
| In U \$ m. | 24.3 | 26.3 | 29.5 | 34.6 | 38.2 | 41.4 |
| \$ US/ rate | 83 | 93.4 | 98.8 | 102.3 | 118.5 | 125.2 |
| % rise | 8.6 | 21.6 | 18.8 | 21.2 | 28.0 | 15.1 |

Source: CVTelecom Annual Reports; CVE = Cape Verde Escudos

It is always difficult to attribute any economic success to one single input. Starting from the high demand for international communication because of large migrant communities overseas, three important steps in the expansion of supply fostered this outcome:

1. The determinate consolidation of the network – with additional receipts of US\$ 20 m. from the sale of 40% of the stocks to Portugal Telecom,
2. More traffic because of better connections through the submarine cable 1, co-financed by Austria, followed by the connection to the international ATLANTIS II sea cable in 1999, and the closing of the inter-island ring in 2002, and
3. The introduction of mobile phones in 1998.

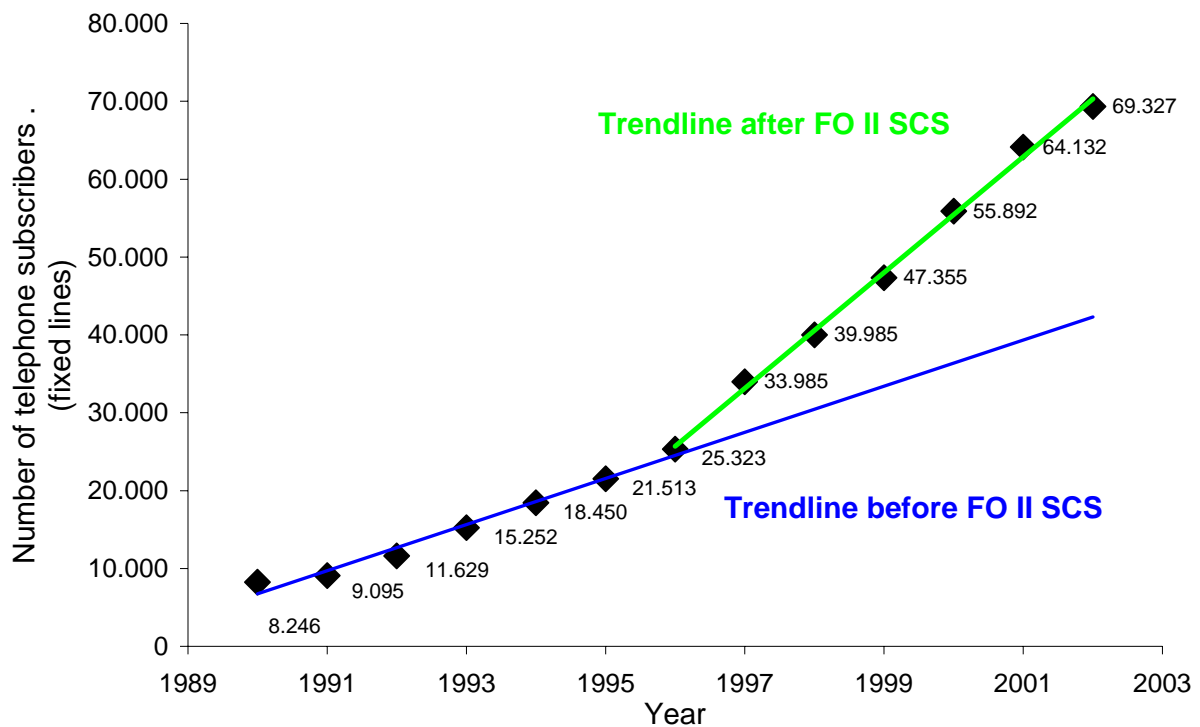
Table 4: CVTelecom Indicators

| | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 |
|--|--------|--------|--------|--------|--------|--------|
| NETWORK INDICATORS | | | | | | |
| Telephone Lines | 25 232 | 33 241 | 39 985 | 46 865 | 55 892 | 64 132 |
| Mobile Phones GSM | 0 | 0 | 1 020 | 8 068 | 19 729 | 31 507 |
| Leased Lines | 0 | 54 | 80 | 108 | 125 | 160 |
| Internet | 0 | 474 | 1 139 | 1 654 | 2 456 | 2974 |
| Density (Lines/100 inhab.) | 6.8 | 8.8 | 10.5 | 10.9 | 12.9 | 14.4 |
| Public Phone | 307 | 425 | 407 | 411 | 394 | 448 |
| International Traffic (% growth) | 5.8 | 28.5 | 18.2 | 21.2 | 15.3 | 41.5 |
| Switching-Lines (10 ³) | 32.0 | 43.4 | 50.5 | 56.9 | 68.3 | 77.4 |
| Digital | 63.5 | 76.0 | 86.6 | 88.8 | 100 | 100 |
| Local Loop (10 ³ Pairs) | 48.4 | 61.4 | 62.8 | 75.0 | 82.4 | 99.5 |
| IU Network (% Digital) | 63.7 | 96.5 | 99.2 | 99.4 | 100 | 100 |
| International Network (% Digitization) | 100 | 100 | 100 | 100 | 100 | 100 |

Source: CVTelecom, Ing. Almeida.

The following figures gives a clear impression of the development of the Cape Verdean telephone market before and after the installation of the fibre optic inter-island sea cable system (FO II SCS):

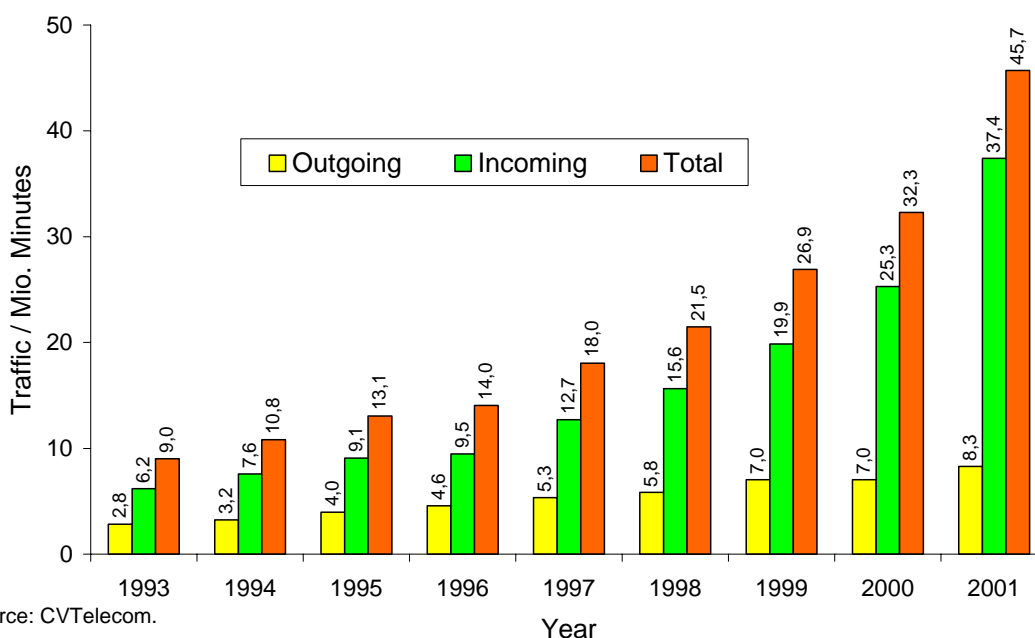
Figure 6: Number of Telephone Subscribers



Source: CV Telecom

Cape Verde's incoming and outgoing international traffic reflects its demographic structure: About 400 000 Cape Verdeans live on the islands, while the majority (about 700,000) lives abroad. One third of the traffic is international calls, and two thirds are calls from abroad – mostly from Europe and the United States.

Figure 7: International Data Traffic



In the CVTelecom concession, the Cape Verdean government set the condition that every village with more than 200 inhabitants had to be supplied with at least one telephone. We were told that this goal was reached in 2002. Of necessity, CVTelecom had to invest a considerable quantity of its revenues in this project. We did not, however, get any detailed financial information on cross-financing matters, although we asked for it.

d) Further Extensions of the Telephone Network

Since the implementation of the inter-island sea cable, there have been several important extensions, fully funded by CVTelecom.

There were fibre optic land cable extensions on the following islands:

- Sal from Espargos to Santa Maria
- Sao Nicolao from Taraffal to Ribeira Brava
- Sao Vicente from Mindelo to Monte Verde
- Santiago from Praia to Monte Tchota.

Most important was the closing of the Cape Verde Inter-Island Fibre Optic Submarine Cable ring between the islands of Santiago to Sao Vicente (224 km) and the connection of the island of Santo Antão with the network via Sao Vicente (31 km). There were and will also be other projects to create fibre optic terrestrial networks on other islands, in order to improve the quality of the service and provide land cable rings to increase the security of the system.

5) Participation

a) Consideration of Cape Verdean Interests in the Choice of Sea Cable Technology

As outlined in the introduction, the recommendation to use sea cable technology initially came from the German consultancy group Detecon, supported by technical arguments. These were reconsidered by Austroconsult. Based on the expertise of our submarine cable specialist Dr. Unger, we will again present the pros and cons of this technological choice in this report. The comparison between submarine cable and microwave in the study by Austroconsult resulted in the general advantage of the fibre optic solution becoming evident (arguments of Austroconsult in *italics*) thanks to:

Reliability: No dependence on the weather situation with the submarine system and down time due to fading in the microwave solution.

No user of a modern telecommunication service (all data transfer of computers, e.g. banks) accepts an interruption in traffic of more than 0.05 seconds. On the other hand, the closing of the fibre optic ring was the only way of achieving the basis for this feature of the submarine cable. Additionally, CVTelecom was having very bad experiences with the microwave system on the island of Fogo (supplied by a Japanese company).

Length/Capacity Restriction of Microwaves.

The alternative telecommunications network with a radio delay system is today still showing the same physical and technical limitations for distances of over 70 km (or very limited bandwidth at 100 km), as discussed in the studies. It was necessary and correct to design a fibre optic network because of the long distances of 101 km, 176 km and 193 km for three of the total four links in phase 1.

The information from our cable expert was confirmed by e-mail by a microwave expert at the IEEE, Prof. Wolfgang Heinrich. The farther the distance, the higher the masts. Only low frequencies can be transmitted over longer distances.

Furthermore, the choice of a submarine cable was right with a view to a closed fibre optic ring and bandwidth upgrade possibilities.

Longer Lifetime: 15 years for microwave, 40 years for the submarine system.

A 40-year lifespan may not be completely realistic because the transmission equipment will most probably need upgrading earlier, but with an investment of only 11% of the project and the increased traffic demand, these possible technical changes easily justify new, more powerful equipment.

Lower operational cost of the submarine cable.

Today, there are more maintenance costs than expected, but the costs are still reasonable. The impact of fishing activities and prohibited anchoring was underestimated. Due to the expansion of the CVTelecom network to include fibre optic land cables, however, there must have been, and still are, a lot of synergy effects which will have reduced the cost of the fibre optic solution.

The possibility of an Austrian production of system parts for the sea cable is higher than that for Microwave.

The cable was produced in Germany.

Cutting-edge technology with optical fibre.

This was, and is, the most important technical argument, since the development of the traffic (customers), mobile phone business (which was not foreseen in the studies) and new services (Internet, etc.) are filling the network to a satisfactory degree and thus there is no technical restriction to the network. For example, the traffic for TV/radio distribution uses a transmission speed of 140 Mb/s instead of the assumed 34 Mb/s. Furthermore, CVTelecom decided to close the ring with a 4-times higher capacity for Phase 2 than Phase 1. The assumed 3 x 34 Mb/s, capacity, which will be needed by CVTelecom in 2008, is smaller than the actual use of 4 x 622 Mb/s in 2003. On the other hand, the assumed expandability limit of 5 x 2.5 Mb/s can be increased to 5 x 16 x 10 Mb/s.

The higher cost and longer repair time of the submarine cable were considered acceptable in comparison to the above mentioned advantages. The assumed equivalence of the revenues and the sufficient spare capacity compared to the future need were not correct, according to present-day knowledge. But the decision to choose the modern technology of optic fibres led the project to be much more successful than expected.

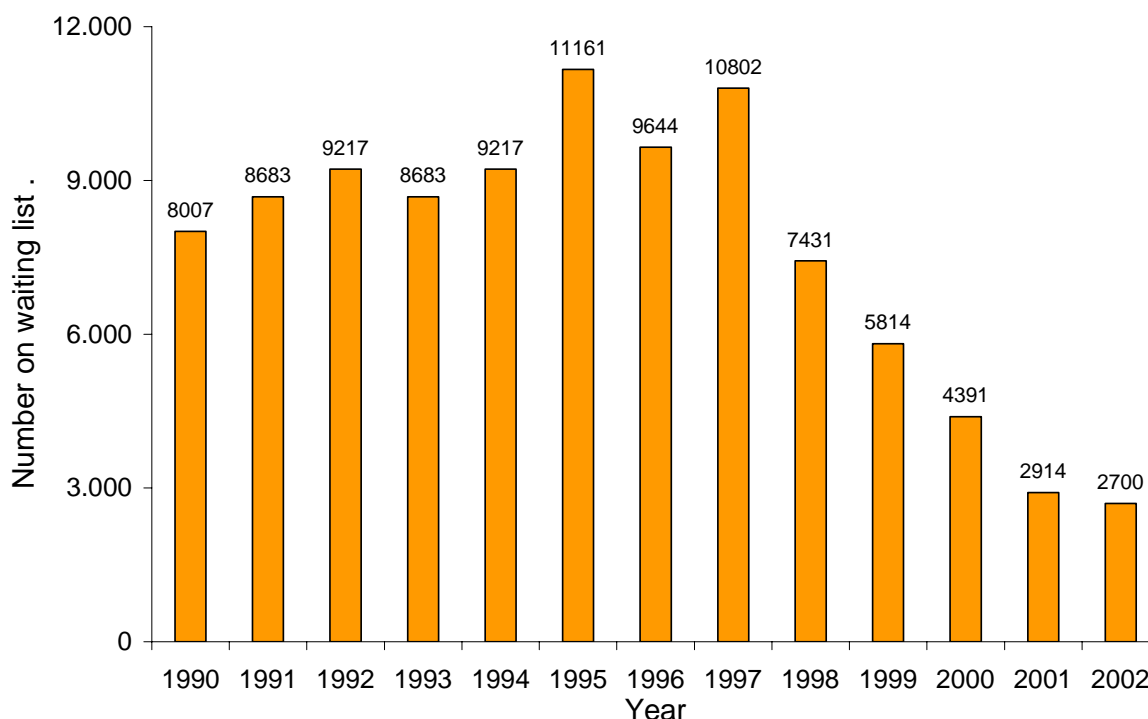
As for the participation of the Cape Verdean partners in this project, there can be no doubt whatsoever

- a) that the Cape Verdean partners in this sea-cable technology project participated very actively in the decision-making processes involved, and
- b) they got what they wanted, namely, the realisation of the best technical option.

b) Studies of Demand before Start of the Project

The Detecon study mentions the need for rural telephony without specifying it. There is a hint of the communication needs of families with migrants. But there were no specified figures. In the official documents, more studies were referred to but were not available for evaluation. But there was, and still is, a waiting list of potential subscribers, as can be seen in the following figure.

Figure 8: Development of Waiting List



Source: CVTelecom.

The fact that 2700 applications are still on the waiting list maybe indicates that a better offer creates a new demand.

c) Affordability of Telecommunications Services

It was not possible to get official figures about the average or minimum wage in Cape Verde. But we can offer some observations and comparisons. In an interview in a German-owned clothing factory in Mindelo, we were told that beginners get a monthly salary of CVE 7,000, which is about 64 euros. At CVTelecom, beginners start with a salary of 227 euros, the highest wage group is paid approximately 1,850 euros. In addition, a high unemployment rate is reported. These remarks give a rough frame of reference for the following tariffs.

Table 5: Telephone Subscriber Tariffs

| | Fixed | Mobile |
|-----------------------------|----------------------|---------------------|
| Connection charge | CVE 3 000 €27.3 | CVE 4 045 €36.8 |
| Monthly subscription | CVE 250 €2.3 | CVE 3 000 €27.3 |
| Three minute local call | CVE 3 x 1,5 €0.04 | CVE 3 x 25 €0.68 |
| Three minute call to mobile | CVE 3 X 45 €1.23 | ? |

Source: CVTelecom 2002. Note: 1 Euro = 110 CVE.

If one compares the budget of a young sewer with the connection charges, one can easily see that such a connection cannot be financed with one's own salary, but only with foreign support. Vis à vis this financial background, it is understandable that many Cape Verdeans get mobile phones and prepaid card contracts from their relatives as gifts, although using the prepaid mobile phone is even more expensive, as can be seen in Table 6.

Table 6: Mobile Cellular Connection Tariff (Prepaid Card)

| | | |
|-------------------|--------------|---------------------|
| | New contract | Renewal in 6 months |
| Connection charge | CVE 7 045 | CVE 5 045 |

Source: CVMovel: Cartao Grilo, Manual de Utilizacao.

There is no monthly subscription fee, but the price policy of CVTelecom for prepaid cards is very restrictive: if a new card is not bought every three to four months, it is not even possible to receive calls (Table 7). According to some short research in the Internet, such oppressive contracts are quite common in Third World countries. By this means, companies try to ensure a regular cash receipt from low income users. In Cape Verde, over 8,000 subscribers were disconnected for not recharging their prepaid cards in 2001.

Table 7: Mobile Cellular Tariff (Prepaid Card)

| Amount of card | Validity of amount/ Month | Validity of contract/ Month | Total |
|-------------------------|---------------------------|-----------------------------|-------|
| 1 500 CVE | 1 | 2 | 3 |
| 3 000 CVE | 2 | 2 | 4 |
| 5 000 CVE (+ 10% bonus) | 2 | 2 | 4 |

Source: CVMovel: Cartao Grilo, Manual de Utilizacao.

The national tariffs for prepaid card users are CVE 35 to another mobile and CVE 40 per minute to the fixed main connections. An interurban call inside the fixed network costs CVE 18. International tariffs are also not encouraging Cape Verdeans to use communications actively, as can be seen from Table 8.

Table 8: International Tariffs 2002

| | Fixed (3 min) | Mobile prepaid (0.5 min) |
|--|---------------|--------------------------|
| Senegal | 90 CVE | 110 CVE |
| Guiné-Bissau | 120 CVE | 150 CVE |
| Portugal | 140 CVE | 170 CVE |
| USA/Canada | 180 CVE | 220 CVE |
| Angola, Mozambique, S. Tomé, France, Netherlands, Italy, Spain, Brazil | 240 CVE | 280 CVE |
| Europe, Sahara Countries | 300 CVE | 320 CVE |
| Other Countries | 300 CVE | 420 CVE |

Sources: CVTelecom: Lista Telefónica 2002-2003, Praia; CVMovel: Cartao Grilo, Manual de Utilizaca. Note: CVE/ 1 € = appr. 110 CVE).

To illustrate the expense of international calls, the following example is indicative. A CVE 3,000 prepaid card is consumed in a 14-minute call to the USA.

In the official project documents there was no definition of any special “target groups” for the project. The paragraphs above show the obstructions set for low-income private users (and also for “not profitable” governmental institutions, such as schools and hospitals). In our user study we therefore asked the people for their assessment of the CVTelecom tariff structure.

Figure 9: Price for Local Calls

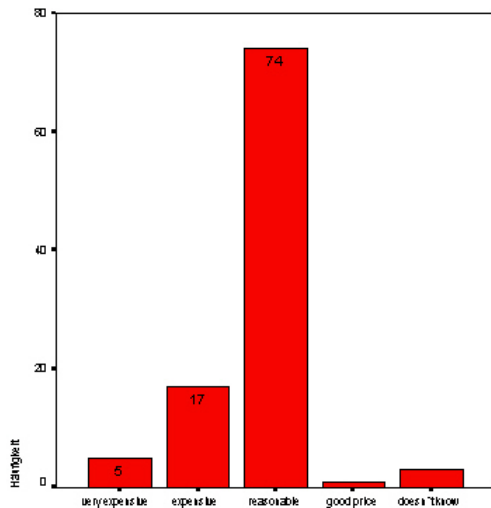


Figure 10: Price for Inter-Island Calls

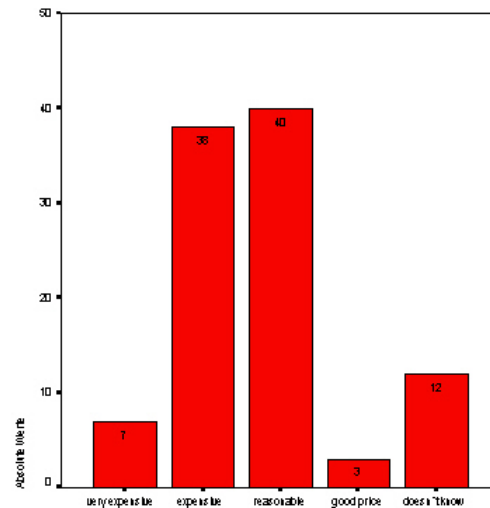
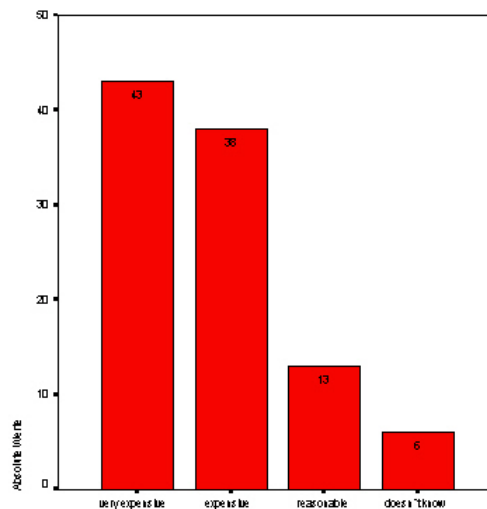
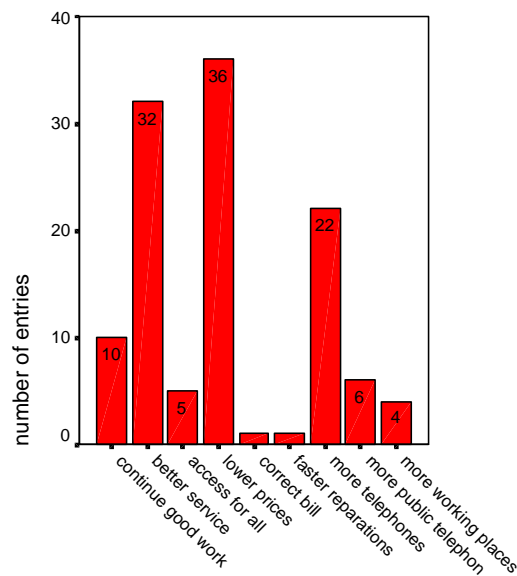


Figure 11: Price for International Calls



As one can see from the answers to our questionnaire, one thing is very clear: The prices are a central problem, and there are hardly any significant differences between the user groups. The local price is accepted, the inter-island price is regarded as being a little bit expensive, and the international one is looked on as being really expensive. When we asked our interview partners what they expected from CVTelecom, the most important reply was lower prices.

Figure 12: Expectations in regard to CVTelecom



The price is really a prohibitive fact, especially in times of economic crisis, when migrant communities overseas have to reduce their support because they often belong to the groups which suffer first from austerity measures in the economies of the industrialised countries.

If CVTelecom will not adjust its tariff policy to the average purchasing power of the national people, the mobile boom could possibly soon collapse. From a social point of view, CVTelecom's price policy is to the disadvantage of those groups in Cape Verde who do not have any relatives in rich countries. These people not only lack resources from abroad, but may even become disconnected from national communications structures.

As regards linking information- and communications technologies (ICT) into measures to combat poverty, a very recent study by the FAO demands that rural access be financially secured and that equal access be guaranteed.

There are no internationally established, binding social indicators for the price of telecommunications services in developing countries.

In Germany the monthly expenditure of an average household to telecommunications comes to 2 – 3 % of the monthly income. Compared with Cape Verdean wages, the expenditure there on telecommunications in an average household must be much higher.

6) Impact

a) Impacts of Telecommunications on Overall Economic Performance

The present strategy of the Cape Verdean Government for economic development is based on integration into the world market. So the sectors on which resources and attention are focused are, for example, tourism and, on a still small scale, “free production zones”, for example, for the international textile market. This policy, however, can have also negative consequences, especially when it comes to gender aspects, e.g., the over-exploitation of the (mostly female) workers in such zones, or prostitution in tourist areas. Furthermore, these sectors are made highly vulnerable by factors on which Cape Verde has no influence, for example, the crisis after 9/11 (the terrorist attack on the WTC and the Pentagon).

The age-old chicken-and-egg argument over the statistical problem as to whether economic growth results in more telecommunications usage or whether an increase in telecommunications possibilities stimulates more economic growth cannot be solved here. Although for reasons of principal, a causal relation between economic and telecommunication growth cannot be measured, we can find a positive relationship between the economic development in Cape Verde and the installation of the sea-cable. Between 1996 and 2000, Cape Verde’s GNP grew at the following annual growth rates: 10.0%, 13.7%, 12.3%, 14.0% and 7.1%. Measured in import and export statistics, the Cape Verde economy had a medium/moderate dynamic in the same time period.

If one does not concentrate only on the overall economic situation of Cape Verde, but also takes into consideration a broader perspective of social development, the relationship between the improvement of the telecommunications sector on the one hand and social development on the other, appears to be a mixed blessing. The 1999 UNDP-Human Development Index (HDI) lists Cape Verde with 0.708 points at rank 91, but one year later it slid down to rank 100 with 0.715 points. But these changes are smaller than the larger ones in the early nineties: in 1994 Cape Verde was then ranked 123 on the HDI and in 1995, 117.

b) Increase in International and Domestic Communication

It was not possible to get data about the development of *national* traffic. CVTelecom authorities confirmed that their internal information system does not process such data.

As already argued under point 4f and in Figure 7, the incoming and outgoing international telecommunications traffic reflects the demographic structure of Cape Verde: one third of the traffic is calls abroad, and two thirds are calls from abroad, mainly from Europe and the United States. More detailed and exact statistics were not made available to us.

c) Location of and Access to the New Connections

There is no data available on CVTelecom subscribers according to special population groups. Furthermore, there is the methodological problem that all statistics are unreliable, as up to 95% of the mobile phone users have prepaid cards. Data is available, however, on the allocation of fixed lines on each island.

Table 9: Development of the Number of Subscribers on Each Island

| Island | Subscribers 1997 | Subscribers 2002 | Difference | Growth Rate | Connection since |
|------------|------------------|------------------|------------|-------------|------------------|
| Santiago | 7,780 | 20,770 | 12,990 | 167.0% | 1998 |
| S. Vicente | 5,347 | 14,400 | 9,053 | 169.3% | 1998 |
| Sal | 1,083 | 3,827 | 2,744 | 253.4% | 1998 |
| Sto Antao | 963 | 5,692 | 4,729 | 491.1% | 2002 |
| Fogo | 942 | 4,248 | 3,306 | 351.0% | No |
| S. Nicolau | 801 | 2,660 | 1,859 | 232.1% | 1998 |
| Brava | 431 | 1,011 | 580 | 134.6% | No |
| Maio | 255 | 1,349 | 1,094 | 429.0% | No |
| Boavista | 238 | 746 | 508 | 213.4% | 1998 |
| | 17,840 | 54,703 | 36,863 | 206.6% | |

Source: CVTelecom

The table shows the distribution of telephones on each island, comparing the years 1997 and 2002. There is no simple correlation between the number of telephone subscribers and connections to the submarine cable. Neither could we determine a correlation with the number of telephones per 100 inhabitants (teledensity):

Table 10: Teledensity on each Island

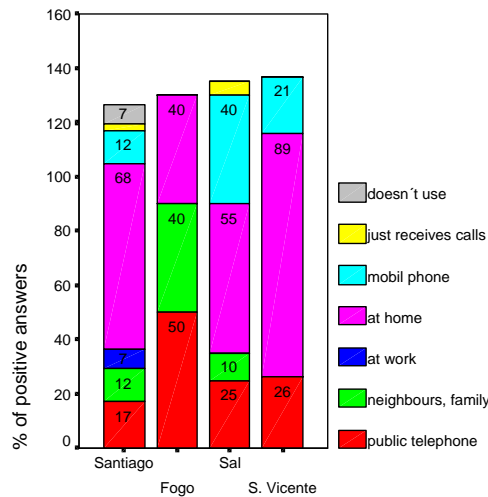
| Island | Population 2002 | %Subscribers 2002 | Subscribers 2002 | Teledensity 2002 | Connection since |
|------------|-----------------|-------------------|------------------|------------------|------------------|
| Santiago | 236,400 | 54.30% | 20,770 | 8.8% | 1998 |
| S. Vicente | 67,800 | 15.50% | 14,400 | 21.2% | 1998 |
| Sal | 14,800 | 3.40% | 3,827 | 25.9% | 1998 |
| Sto Antao | 47,100 | 10.80% | 5,692 | 12.1% | 2002 |
| Fogo | 37,400 | 8.60% | 4,248 | 11.4% | No |
| S, Nicolau | 13,500 | 3.10% | 2,660 | 19.7% | 1998 |
| Brava | 6,800 | 1.50% | 1,011 | 14.9% | No |
| Maio | 6,700 | 1.50% | 1,349 | 20.1% | No |
| Boavista | 4,200 | 0.90% | 746 | 17.8% | 1998 |
| Overall: | 434,700 | 99.60% | 54,703 | 12.6% | |

Source: www.world-gazetteer.com/CVTelecom

Geographic, technical and economic considerations are decisive for the connection to the cable, whereas the installation of new telephones is determined primarily by economic reasons. The case of Fogo seems to be an exception: Though Fogo, especially in the northern part of the island, is an important agricultural centre, the unique geography of this volcano island seems to obstruct the expansion of the telephone network.

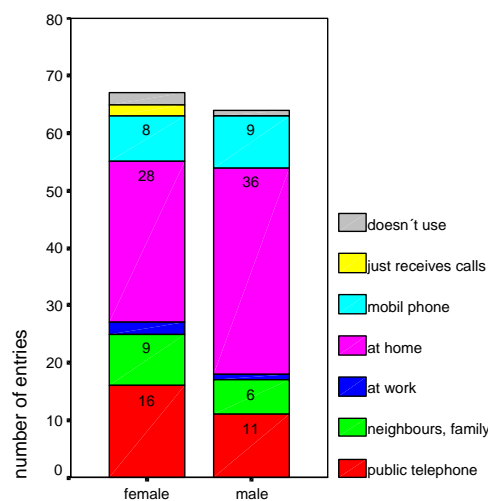
The findings of the survey on access to the telephone networks and the installation of new connections complement the official data. Regarding access, there were numerous important differences between the islands: on S: Vicente 89% of those interviewed had a telephone at home, on Fogo only 40%. On Sal 40% use a mobile telephone, on Fogo nobody. Correspondingly, half of those interviewed on Fogo use public telephones, while on Santiago the figure is only 17%. 40% of those interviewed on Fogo use their neighbours' phone, while none of the interview partners on S. Vicente do.

Fig. 19: Usage of Telephone/Island



What is striking here is that the telephone use on Fogo falls behind that on the other islands. This has little to do with the fact that Fogo is not linked to the sea cable. Rather, telephone density on this island is comparably poor, and the geographic conditions hinder the development of a wide-ranging mobile phone network. The above average use of the telephone by those interviewed on S. Vicente has to do with the fact that the structure of this island is dominated by its capital city Mindelo (96% of the island's population).

Fig. 20: Usage of Telephone/Sex



In our interviews we found out that more male than female interview partners had a telephone at home. That corresponds to the fact that female-headed households in Cape Verde (HDI: 38%) are generally the poorest.

Moving from the centres to the rural regions, the percentage of owners of home telephone connections and mobile phones decreases constantly, while the percentage of those who use their neighbours' telephone increases. In this category there were also big differences on the question of newly installed telephones: in the small towns 91% say that a lot of telephones have been installed, in the rural regions only 55%; of those 20% even say that no new telephones have been connected.

As the Tables 9 and 10 show, the majority of new telephones were installed on Santiago, which still has the lowest teledensity of all the islands. The highest teledensity is found on Sal due to the high needs of international tourism.

d) Opinion of CVTelecom Managers about the Project

Leading engineer Graciano Borges answered as follows:

“Yes, the goals of the project were fully realised. The implemented communication system is able to supply current needs and can be upgraded for future demand. Currently 6 fibres (out of 10) are used on average. If there is any need for higher capacity, the bit rate of the transmission equipment can be increased, also on selected links only. A very important step to guarantee the quality of the service was the closing of the ring in Phase 2 (financed by CV Telecom only).”

A similar answer was also given by other experts we talked to.

e) Job Situation

Leading CVTelecom manager Francisco Almeida said this about this complex:

“Naturally, yes, by itself, the project introduced new technology into the network. Although CVTelecom had introduced digital technology by that time, the submarine cable system was the first SDH system in the CVTelecom network. Starting from that point, the whole network started to grow in size and complexity, with the introduction of these new services. This has led CVTelecom to recruit new engineers and qualified technicians. The percentage of highly-qualified staff in CVTelecom has increased from about 9% in 1997 to 15% (of 466 employees) in 2002.”

Another important aspect is that in spite of the privatisation of the former public enterprise, there was no reduction in the number of employees (one third female). The biggest union SITTHUR is satisfied with the enterprise's development. In 2002 the first collective wage agreement in the history of Cape Verdean telecommunications enterprises was signed.

f) Integration of Target Groups

There were no defined target groups. The expansion of the network is guided by market conditions. In our user study, 78% of our interview partners evaluated the distribution of telephones in their country as satisfactory. Here a significant difference

between the islands is that on Sal only 50% find the distribution fair. On this island, many of the phones are reserved for the hotels.

g) Social, Economic, Cultural or Political Effects of the Telephone Network

The President of the CV Telecom Council of Administration answered this question in the following way:

"For Cape Verde, international communication was and is of unusual importance, and international traffic constitutes a high proportion of the overall telephone traffic. The fact that the country is composed of scattered islands makes it important to have a well-established national telecommunications network, not to forget the communities living abroad and the fact that tourism is considered to be one of the major sectors of development. The number of telephone subscribers has grown from 1,700 in 1975 to almost 9,000 in 1992, but there were numerous shortcomings to be resolved, at all levels of the network. The ability of the fibre optic technology to extend capacity was a crucial factor in spreading the telephone service all over the country, achieving over 68,000 fixed phones and 39,000 mobile phones. Nowadays, the banking, insurance and travel services are online 24 hours a day, thanks to the improvement of telecommunications quality. The role of telecommunications as a key factor in the accelerated growth of the economy was recognised by the Government and by all the operators in the private sector, as well as the common users."

As argued already in our answer to question 6a, for reasons of principal any causal relation between a telephone network and a social impact cannot be proven in a strict empirical sense. But we agree with our expert interview partners, who unanimously argued that the sea-cable supported telephone network in Cape Verde did indeed play a "crucial" role in improving the overall living conditions of the people.

h) Knowledge of Telecommunications/ Obstructions to Use

97% of the interviewed people used the telephone casually. Many of them complained about high prices. The expansion of the network and the support by relatives from overseas facilitate access to the network – the high prices hamper it.

i) Project Communications of the Austrian Development Cooperation (especially in Sta. Cruz)

Regarding the case of Sta. Cruz, project communications were not affected by the new equipment, because problems with the community administration in 1994/1995 impeded further cooperation with the region.

The Austrian Development Cooperation with Cape Verde was almost exclusively centred on the main island Santiago, and therefore had few direct advantages from better inter-island connections, but the immediate benefit of more and generally better telecommunications connections, including mobile phones and the Internet, is obvious.

j) Usable Experiences in Co-financing

The answers to this complex subject differed fundamentally, so that it is problematic to draw a clear conclusion. The fact is, however, that other projects co-financed by the OPEC fund and the Austrian Government in Cape Verde have followed (water and energy supplies in 1999).

k) Institution Building

In our evaluation procedure in Cape Verde we came to the conclusion that the governmental regulatory agency is still not working well, and such an agency is necessary for the functioning of any privatised telecommunication infrastructure, as it a) has to set the rules for private business competitors, and b) has to take public interests into account. In Cape Verde, neither the question of fixing tariffs, nor the supply of the telecommunication infrastructure at appropriate costs to public agencies such as hospitals and schools are dealt with in any kind of urgency, which would be appropriate.

7) Sustainability

a) Repair and Maintenance of the Submarine Cable

Five cases of damage to the submarine cables installed in phase 1 have been reported so far. Siemens organised the first repair and CVTelecom have carried out the following repairs and maintenance operations.

Table 11: Damage to the Inter-island Sea-cable

| <i>Date</i> | <i>Section of the Cable</i> | <i>Duration</i> |
|-------------|--|-----------------|
| 10.02.98 | Santiago to Boa Vista (near Boa Vista) | 13 days |
| 05.07.98 | Sao Nicolao to Sao Vicente (near S. Vicente) | 12 days |
| 31.08.98 | Sal to Sao Nicolao (near Sao Nicolao) | 10 days |
| 31.12.00 | Santiago to Boa Vista (near Boa Vista) | 8 days |
| 25.10.02 | Boa Vista to Sal (near Boa Vista) | 6 days |

The submarine cable requires more maintenance than expected. The main reason for damage was fishing activities and unauthorised anchoring (in prohibited areas). Unpredictably, there was damage to cable sections that have two layers of steel armouring; only one lightweight armoured cable was damaged. The concept of using lightweight armoured cables (one layer of armouring) was correct. Most of the damage was due to the dragging of fishing nets and anchors. Thus a stronger cable (three layers of steel armouring) could be better, but this would be no guarantee of protection. That is why CVTelecom decided to fix the cable, using concrete blocks with suitable holes, to avoid movement of the cables and to generate coverage of the cable by sand. For further protection, the position of the cables are also being marked (project ongoing) with buoys and the fishing association and maritime authorities informed.

If damage to the cable occurs with the same frequency as experienced, the loss of the fibres will reach a limit. Thus a lifespan of 40 years with the original transmission equipment is not realistic. The power budget (optical transmission power) of the system probably allows repairs for the next 5 years.

There is an annual maintenance budget of approx. CVE 5 m. (\approx US \$ 40 000 \approx Euro 45 500) plus the same amount for the average annual repair cost (compared to approx. US\$ 96 000 \approx Euro 109 000 which was only for the ship used by Siemens for the first repair).

CVTelecom revenue is ensuring professional maintenance of the fibre optic cables and network. The selection of a local company to provide the ship for cable repair is reducing the costs and involving local people. The costs of the repair and maintenance of the fibre optic network are reasonable compared to the telecommunication revenue of CVTelecom of CVE 5 213 m. (\approx US \$ 41.1) in 2002. CVTelecom is providing locally trained experts for the work on the fibre optic cable.

On March 31, 2002 CVTelecom finished a second sea cable project, called phase 2, from Praia on the island of Santiago to Tarrafal via a land cable, and from there to Sao Pedro on the island of Sao Vicente via a sea cable, plus an extension to Porto

Novo on the island of Santo Antao (see the red line on the map in section 2b). With the termination of this second project, the so-called ring could be closed. This closing has a lot of positive consequences for repairs and maintenance.

Before the closing of the ring, there was a backup of the network via a domestic satellite system from Praia to Mindelo via an F3 antenna (capacity 3 x 2Mb/s with DCM), but the transmission capacity was at its limit and only very reduced traffic could be transmitted. For instance, radio and TV broadcasting were not possible via this national satellite link. Banks were partially disconnected and special leased lines for airlines were not operational. Today, the domestic satellite system is not really necessary due to the ring network, but it might be used (extended) in the future for international traffic.

Cable damage will now no longer result in reduced transmission capacity via a satellite or a loss of traffic because the signals are re-routed via the other leg of the ring.

One solution to overcoming the higher loss of capacity due to repairs could be a modernisation of the transmission equipment. State-of-the-art equipment could provide more optical power and a higher bit rate, resulting in at least 15 years more lifespan for the system with the existing cable. On the other hand, modernisation of transmission equipment is a standard procedure in telecommunications and the initial investment for the line terminal equipment and multiplexers was only 11% of the whole network cost.

b) “New Economic Partnerships”

The Austrian Government supported the first phase of the network with US\$ 7 m. Unlike the first project, CVTelecom could raise the sum of US\$ 6.5 m. from its own resources for the second stage of the sea cable project with Siemens Austria.

Sustainability is a term and concept with which to comment on and judge this follow-up business between Siemens and CVTelecom. It certainly had a positive impact on both the Austrian foreign economy as well as on the Cape Verdean economy, and in particular provided consistency of technical standards for both sea cables, as they were both provided by the same industrial supplier.

But there is also a second way to judge and comment on this follow-up business between CVTelecom and Siemens. Within this second possibility of interpretation one can argue that public money from Austria was privatised by Siemens, as the main winner from phase one. This public money was invested in a new private market which was to grow and blossom without any risk to the Siemens company. After enough private profits were realised in this new market, the Siemens company got a second contract to enlarge its business (again without any great risk).

With such an interpretation, the term “sustainability” would be misleading; it would be more appropriate to call this process “privatisation of public funds”. This process is anything but new, especially in the telecommunications market and business. In the tradition of the state/ business structures of an “Amtsbaufirma” (a company which

often wins governmental contracts), Austria and Germany have been, and still are to some extent, captive markets for Siemens AG.

Dealing with sustainability, also the ecological effects of this technology should be considered.

c) Cape Verde's Share of Costs

Leading CVTelecom engineer Carlos Inocencio and other experts assured us that CVTelecom has contributed 22.6% of the total amount of approximately US\$ 14 m., according to the project finance plan, for local work, support of the project management and contacts to local companies, for example Siemens. The evaluation team has no reason to doubt this answer.

d) Payback of the OPEC Loan

In February 2003 a credit advice from the OPEC Fund for International Development dated 2 October 2002 was received affirming the entry of US\$ 235,287.00 from the Cape Verdean Ministry of Finance in September 2002.

The amount of US\$ 50,000.00 plus US\$ 48.96 charges were repaid for loan No. 291P, and the amount of US\$ 124,240.00 plus US\$ 60,998.04 charges was paid back for loan No. 622P.

In the documents available for the evaluation, the respective loan number for the US\$ 3 m. loan for the Inter-Island Sea Cable Project is not registered, with the result that our conclusions from the mentioned OPEC receipt are limited: We note the fact that the Cape Verdean Ministry of Finance is paying something back to OPEC. Definitely a 'good sign'.

8) Efficiency

a) Justification of Expenses

The Cape Verdean project partners chose the fibre optic cable technology and defended it against Austrian economic scruples. The investment of \$US 14 m. in the technology is also justified by the price of US\$ 20 m. for 40% of the stocks given by Portugal Telecom, and by the annual revenues of CVTelecom (2002: more than US\$ 40 m.).

b) Comparison with Up to date Technical Know How

As described under 5a, the decision for the technology with optic fibres led to the project being much more successful than expected. Another advantage of this choice of technology was/ is an affordable possibility to upgrade the installations with new transmission equipment when needed.

9) "Lessons Learned"

a) Operative Experiences concerning this Project

- Some delays in this project could have been avoided had the Detecon study been studied in advance and more carefully. The option for sea cable technology was already technically well justified in 1992.
- Although in the addendum to PIC 1993-1995 conditions for cooperation had been laid down, a meaningful concretisation and follow-up of these conditions were not formulated.
- From the very beginning of the project, the bidding and competition process between Siemens AG and other possible industrial suppliers for sea cable technology was not a very open one. Had offers from Alcatel, for example, been taken more seriously, it would have been possible to reduce the overall price by a margin of 10-15%, according to our estimations.
- The relationship between the Austrian Government and the Austrian consultancy Austroconsult remains strange and difficult to judge: Who decided at which time and for what reasons that Austroconsult should do a feasibility study, select the supplier, and later also take responsibility for the technical control of the overall project and even sign for its final acceptance vis à vis the Cape Verdean Government?

b) General Experiences in Development Aid Policy

In not a single document did we find an explanation why the support for Cape Verde was changed from a loan to a grant. (Perhaps loans were not planned in the general cooperation agreement?) On the one hand, we do not want to recommend loans as the only appropriate means in development aid policy, especially as a lot of poor Third World countries are suffering from their inability to pay back such loans. On the other hand, telecommunications infrastructures in Third World countries very often produce profits similar to state-owned money printing facilities, so that it is difficult to understand why this project was not financed via loans. What must be stressed, however, is the following fact: If the Austrian side had its own good reasons for financing this profit-making project in the form of a grant, why were the conditions for this grant not coupled with legally binding obligations to ensure the socially relevant impacts of telecommunications in Cape Verde?

Granting telecommunications infrastructures free of charge to poor countries in the South neither conforms with market mechanisms, nor with the "normal" European philosophy of development aid policy. Technological projects, which are very often conceptualised in the area of financial and not technical cooperation with Third World countries, tend to neglect actual developmental dimensions like gender, environment or culture. In such technological projects, from the very beginning one should look systematically into the question of how, when and why the typical developmental issues can be embodied strictly (and even in a legally binding way) into contracts.

10) Conclusions and Recommendations

a) Conclusions

In this report we could establish that telecommunication tariffs as well as contract conditions (especially for mobile phones) discriminate against target groups (socially underprivileged people and public institutions) which are of high importance in any development aid policy.

In order to remedy such grievances, a well-designed institution such as a state regulatory agency would be necessary. As a state agency, such an institution would be in a position to initiate socially relevant projects.

It is precisely in this context that we recommend a much better and cheaper access for hospitals to the telecommunication network. Without any additional costs for CVTelecom, it would be possible to offer hospitals, schools or other educational facilities fixed lines.

Adjustments of telecommunication tariffs to national wages, which means in this case that CVTelecom should lower its prices, could possibly increase the nationwide demand for telecommunications.

The authors of the recently published "Cape Verde Internet Case Study" for the International Telecommunication Union (ITU) argue that the necessary regulative of the present situation is market liberalisation, i.e. the abolition of CVTelecom's absolute monopoly of all telecommunication services. Perhaps this demand cannot be met because of a clause in the Memorandum of Understanding of the PIC 1993-1995, where one can find the following paragraph: "The Government [...] shall not provide licenses to bypass operators".

b) Recommendations for Future Actions

To FMFA:

The Austrian Government should re-consider the meaningfulness of the clause whereby competitors are excluded from the Cape Verdean telecommunications market.

To FMFA:

In order to guarantee the appropriateness of such large technological projects in the future, a coherent integration of the social and cultural dimensions of technology transfer should be implemented right from the very start of any such project. Especially in the case of the male-dominated area of technology policy, the gender aspect is of utmost relevance in order not to increase existing disparities.

To FMFA and project partners, in this case CVTelecom:

According to the guidelines for mainstreaming the gender approach (Austrian Development Cooperation 1998) such a proposal could mean, for example:

- gender awareness training in the institutions concerned,
- discussions of ways in which to ensure the access of poor rural women to basic telephone services, and
- special grants and scholarships for female engineering/information technology students.

To FMFA and Coordination Office:

The expansion of telecommunications is a measure to support a world market-orientated economic policy, especially in sectors such as tourism or “free production zones”. This policy, however, can also have negative consequences, especially when it comes to gender aspects, e.g. the over-exploitation of the (mostly female) workers in such zones, or prostitution in tourist areas. Groups and institutions opposing these tendencies and assisting the affected persons should be supported.

To FMFA and Cape Verdean Government:

The regulatory agency should be set up and assisted. For this purpose, the FMFA could offer legal, organisational, and telecommunications policy advice through a new project.

To CVTelecom:

Measures should be taken to guarantee access to telecommunications for the socially disadvantaged and institutions like hospitals.

CVTelecom should consider longer validity periods for the prepaid contracts for mobiles, e.g., for single mothers. Any “dead” mobile which cannot be used because the prepaid contract was not extended does not increase business as incoming calls cannot be received.