EXECUTIVE SUMMARY

1. INTRODUCTION

Since 1987, WaterAid's main input in Nepal has been to a joint water and sanitation Project established with the Social Services National Co-ordination Council (SSNCC). The Project has a number of interesting features and WaterAid requested Dr David Wright, Management and Engineering Consultant, to evaluate the Project. He visited Nepal from 10 February to 22 February 1990 to assess the effectiveness of the work to date and to provide guidance on the way in which the future programme should be developed. During his visit he was briefed by Mr Jon Lane, WaterAid's resident engineer. He met the senior management of the SSNCC, the Directors of a number of NGOs, representatives of government departments and aid agencies and the Project staff. He was also able to visit two projects in the field in Lamjung and Gorkha districts.

2. WATER AND SANITATION IN NEPAL

2.1 Review of Present Position

The population of Nepal is estimated at around 18.5 million. Of these some 94% live in the rural areas. The population is increasing at around 2.7% per annum, a relatively high figure. Literacy rates are low; on average around 35% for men and around 11.5% for women. The literacy rates for women living in the rural areas is probably even lower.

It is estimated that 30-35% of the population have access to potable water, but that only 2-3% have access to any sanitation facilities. In the rural areas this is probably 1% or less.

Typical consumption of water is in the range of 12-18 litres per head per day, which is not high by international standards. It has been estimated that on average it requires four woman - hours per day per family to collect this water.

Sanitation in the rural areas beggars description - the construction of many latrines is so poor that they are impossible to keep clean and so are of no real aid to the hygienic disposal of excreta. This situation is largely responsible for the very poor health of people (see Table 1). The high incidence of diarrhoea and worms will be noted.

2.2 Organisations involved in the sector

The Ministry of Housing and Physical Planning is the lead agency for the government and is responsible for co-ordinating, planning and implementing the water and sanitation programme and for maintaining the data base. In the smaller towns and in the rural areas it does this through the Department of Water Supply and Sewerage (DWSS). The Ministry has recently established a national water and sanitation co-ordination committee to link the other ministries involved.

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IN: Wh 3479 LO: 822 NIP (822 - NP90-8479 National voluntary organisations in Nepal have a long and honourable history, often with royal patronage. They reflect the predisposition for self-development among the Nepali people, which is still very much alive. Conditions in Nepal have also attracted many international voluntary organisations to complement the national NGOs. There are around 50 international NGOs active at the present time and at least 200 Nepali ones. Improvements to health feature among the objectives of at least half of the expatriate NGOs, while improvements to water supply are listed as one of the objectives of nearly all the Nepali NGOs. Sanitation is noteworthy for the infrequence of its appearance.

Those NGOs with long experience in Nepal are firmly committed to bottom-up development and the full involvement of the community. Some see integrated rural development as the way to go. The importance of non-formal education for women as the prerequisite of other development activities is noted.

The Social Services National Co-ordination Council is the apex body which links the international and national NGOs. The Council is technically a non-government autonomous body and is chaired by Her Majesty the Queen. The Council recognises that it should seek to provide three types of assistance for its NGO members - institutional, financial and technical - to help them to improve the effectiveness of their delivery of services to the village people.

The main international aid agencies working in the field are the UNDP, the World Bank, and UNICEF. UNDP is supporting the government in a number of ways, including the 'Management Information for technical support for water supply sector agencies'(MITS) project (executed by the World Bank) whose overall objective is to improve the collection, processing and dissemination of information relating to water supply and sanitation projects.

UNICEF has provided major inputs since 1971. In 1989 UNICEF's inputs were some US\$2.3 million and the projects it has assisted represent some 40% of all rural water projects undertaken by the government. In its new five year plan (1992-96), UNICEF will be emphasizing the software aspects of the sector.

WATERAID IN NEPAL

3.1 Establishment of SSNCC/WaterAid Project

In recent years the Council has developed a more effective and pro-active role by which to help NGOs to formulate and execute development projects and to improve liaison between national and international NGOs.

Mr Collett, the Director of WaterAid, and Mr Bill Bailey, the Engineering Adviser for Nepal, visited Nepal in November 1984 and January to March 1986 respectively. They concluded that WaterAid should develop a water and sanitation project jointly with the Council. The first Memorandum of Understanding was signed in 1987: this has recently been renewed.

These services provided by the Project include:

- * advice on project formulation and proposal writing
- * technical work on survey design, budgeting programming and purchasing
- * supervision of construction, including training
- * advice on community management, project operation and maintenance
- * training and supervision for hygiene education
- * provision of external funds
- * general information and advice.

At present the Project is supporting 19 schemes being undertaken by Nepali engineers or by village water and sanitation committees to benefit approximately 50,000 people.

In the period from October 1987 to January 1990, the staff in the Project office increased from five in October 1987 to 14 in January 1989 and to 17 in January 1990. The first two projects undertaken were for sanitation, largely as a result of the hygiene education activities of the Decade cell in the period 1982-87. Since then the majority of the projects have been for water. Table 2 summarises the water projects executed between 1987 to 1990.

3.2 Annual Planning and Implementation Cycle

The cycle for community-based water projects is dominated by the occurrence of the monsoon, the planting and harvesting periods and the festivals. The overall planning cycle for projects to be funded out of the budget approved by the Council for a financial year (which runs from 1 July to 30 June) starts by around the preceding December with the submission of proposals by the NGOs to the Council.

The annual cycle of sanitation projects is less dominated by the seasons, though still influenced to some extent by harvest and festivals.

Thought is being given to the basic order in which the various components of a sanitation programme are best organised. It is likely that the hygiene education/sanitation component could last for around three years.

3.3 Project Procedures

The Report summarises the various technical and management procedures which are used in the Project office to make the work more efficient and cost-effective.

The Project applies a two-stage process to selecting the schemes it will adopt out of those submitted to it by the SSNCC. Schemes are shortlisted, taking into account criteria like balance between different types, location in the poorer communities, some concentration geographically, development of some new locations, and reasonable travelling logistics.

The capital costs of most schemes are less than £10 per head. The technical and financial requirements of maintenance and repair are explained to the village people, but recurrent cost data are not available at present.

The Project office is gradually developing a range of standard documentation to guide its operations, for example on policy, survey procedures, design, standard agreements, and maintenance.

It is noteworthy that the Project treats the NGOs and village communities as responsible entities and this enhances respect and trust.

3.4 Project Staff

The staff are just adequate at present to meet the present annual commitments of around 14 projects. However any increase in projects will mean that additional technicians, health educators, maintenance technicians and maintenance supervisors will need to be recruited. Careful resource planning will be needed to decide what projects can be responsibly accepted in the future.

It was noted that :

- * there are at present no regular professional or technical development training programmes for staff.
- * each of the project staff has opportunities for the training of others, particularly NGOs and the Village Project Committees. However (with one exception) none of the staff has been trained as trainers.

WaterAid's representative engineer, Mr Jon Lane, spends roughly equal time on each of his three main duties as engineer, as manager, and caring for Water-Aid's affairs with respect to the Council.

On the engineering side, Mr Lane's most time consuming duties are his visits to the field with the overseers, but these inputs are quite essential if quality and cost-effectiveness are to be maintained. On the management side, since Mr Lane set up the office and recruited all the staff, his influence is all-pervasive. Mr Lane has taken his responsibilities towards the Council very seriously and has kept the senior management informed of project progress and developed a most constructive relationship with them.

3.5 NGOs and Village Project Committees

3.5.1 NGOs

The inputs of the NGOs and village project committees are absolutely vital to the success of the self-help projects. In the time available the author had the opportunity to meet only a few representatives of local NGOs. His main impressions were that NGO committee members have a genuine concern for the welfare of the village people, take time to assess their problems and appreciate the written agreement between the Project and NGO/village committee. The NGOs frequently act successfully as fixed price contractors for the schemes.

3.5.2 Village Project Committee

The report notes of the village project committees that:

- * they tend to be male dominated since women are the key to the achievement of improved health there is an institutional-cultural problem here which needs to be solved.
- * the formal written arrangement with the Project appears to work well.
- * their organisation of contributions in kind to construction appears to work well.
- * the key importance of educating the children at school in hygiene is well appreciated.
- * more work needs to be done to identify and promote the basic types of latrine which are appropriate for the village people.

4 Conclusions

4.1 The SSNCC/WaterAid Project

The aim of the Project is really quite sophisticated: that is, it is $\underline{\text{not}}$ to implement water and sanitation schemes directly itself but rather, through the cooperation of the NGOs and the village committees, to show what the village people can do for themselves. This means developing and training a group of professional and technical staff in the required range of technical and management skills so that they can train and assist others.

The author's conclusions are summarised under the heads of the terms of reference.

4.2 Effect of the Project on the SSNCC

The senior management of the Council is actively attempting to make it more responsive to the operational needs of the agencies working in Nepal and more supportive of their role. Relations between WaterAid and the Council are good, not least because Mr Lane adopts a policy of keeping the staff of the Council informed of WaterAid's plans and policies.

The result is confidence by the Council in WaterAid: one outcome of this has been an invitation from the council to WaterAid to participate in the formation of the newly proposed "Technological Resources Centre".

4.3 Project Management

The Report highlights the following points as evidence of effective Project team management:

- * the Project now has clear policy goals on water, hygiene education and most recently, sanitation
- * a monthly management meeting for senior staff is held

- a series of guidance notes for the staff and NGOs is in the course of preparation
- * standard details for construction have been prepared.
- * an annual planning cycle has been established for the water components of the Project
- * a high quality of work is expected and usually achieved

There are areas where further improvement is needed:

- * the staff are stretched to their limits technically and they could all benefit from further training
- * the organisation needs to operate under one manager
- * the full implications of the sanitation programme on staffing levels are only now being worked through
- * simple corporate planning should be introduced to determine the resource implications of acceptance by the Project of responsibility for an increasing number of schemes. Only then can rational judgments be made about what is and what is not feasible
- * every member of staff has the opportunity to be involved with training others and needs instruction

The management change proposed is that direct responsibility for managing the office should pass to a Nepali, while the WaterAid engineer adopts an essentially advisory role (see Section 5.7 and 5.8).

4.4 Field work and sustainability

Work in the field which is appropriate in terms of operation, maintenance and repair is also <u>sustainable</u>. The development of such projects requires the participation of the community in the essential decisions leading to the development concerned, and this lies behind WaterAid's basic decision to work through the NGOs. The features of the Project which lead the author to conclude that the field work for water schemes is appropriate include:

- * baseline surveys of engineering and health needs are made
- * schemes are designed to be as simple and reliable as possible
- * the adoption of a written form of agreement between the Project and the NGO
- * the collection of monies for maintenance prior to installation
- * the appointment of a maintenance worker by the village project committee

* regular meetings between the Project and the NGO and the village project committee

All four of the sanitation projects are still ongoing and thus it is too soon to form any conclusions about their sustainability.

The full involvement of women in community participation is crucial. Nepaliculture often makes it difficult for the village women to play a full part and the project is encouraging the use of women health educators and motivators.

4.5 Technical Aspects

4.5.1 Water Supply

The Project is developing a standard range of management procedures, site practices and designs, which will go a long way to ensuring a good standard of constructed works.

Among points that the author feels require further consideration are:

- * 45 litres per head per day should be taken as the norm for design, instead of a figure of 35 litres per head per day. This lower figure should be regarded as the minimum acceptable value.
- * some designs are a bit 'pinched'; the author recommends that the extra benefits and costs of using a delivery pipe one increment larger than what would be needed strictly on hydraulic grounds should always be carefully assessed.
- * the ordinary taps available in Nepal are of very poor quality and some only survive a few weeks in service: a new and more robust design which can be made locally is needed.
- * there is no simple means of pressure-testing the joints in the HDPE pipes made up on site
- * rainwater harvesting does not seem to be known in Nepal, and should be reevaluated.

4.5.2 Hygiene Education and Sanitation

There is comparatively little operational experience to go on as yet, but the Report notes that:

- * a booklet is in preparation which illustrates the main types of latrine available. This should include indicative costs.
- * the interrelation between the components for hygiene education, latrine demonstration and promotion, and latrine construction has still to be worked out in detail. A policy document on sanitation was in draft.
- * as a matter of policy, hygiene and sanitation components should be insisted upon in all projects, even those where the initial request is only for water supply.

4.6 Cost Effectiveness of the Project

At present there is little comparative data in Nepal on which to assess the relative cost-effectiveness of schemes carried out by different organisations. On the evidence available, the schemes carried out by the Project are cost effective and meet WaterAid's global norm for capital costs of around £10 per head. Data is not yet available for recurrent costs.

Factors identified by the author which contribute to cost effectiveness include:

- * schemes are shortlisted on the basis of logical criteria
- * a survey is done for each of the shortlisted schemes
- * surveyed schemes are carefully considered for technical, financial and management feasibility
- * tenders for materials are issued to get competitive prices
- * fixed price contracts are placed for construction, often with the NGOs
- * the work is properly planned and monitored from the Project office.

4.7 Impact on NGOs

The Project has had considerable beneficial influence nationally through the advice it gives to a number of national and international NGOs.

Policies which the author feels are of most benefit to NGOs include:

- * an explanation about the Project's procedures, which helps the NGO to feel responsible
- * the existence of a written agreement between the Project and the NGO
- * regular meetings between the Project and the village project committees
- * the comprehensive, fair and simple way in which the works are described in the cost schedules, so that the NGO knows what is expected
- * the simple and effective way in which progress payments are authorised and made

4.8 Effectiveness of Hygiene Education

The staff of the UNDP Decade Cell (1982-87) within the Council developed hygiene education programmes which bore fruit in two of the original project areas. The Project had to pick this work up after a partial interregnum and only within the last fifteen months has the programme of hygiene education been systematised.

The messages conveyed by hygiene education may be better understood and accepted if the women to whom it is directed first have the benefit of non-formal literacy programmes.

The author strongly supports a policy in which:

- * hygiene education and sanitation are seen as essential companions of the water programme, not as afterthoughts
- * the main target group for hygiene education is the women in the villages, with women Project workers playing key roles
- * a carefully phased hygiene education and latrine promotion and construction programme is planned on a pilot basis, so that lessons can be fed back as the work progresses.

The staffing implications will have to be assessed carefully as part of the corporate planning exercise.

The possibility of evaluating health impacts is often raised. Although a statistically valid result would often require expensive, large-scale field data-collection exercises, it may be possible in Nepal to design a survey using a reduction in occurrence of diarrhoea (or worms) as a proxy measure of the impact of improved water and sanitation Expert advice needs to be taken.

4.9 Overall Assessment

The three basic questions to be answered in any evaluation are :

- a) Is the work relevant?
- b) Has the work been done efficiently?
- c) Has the work achieved its objectives ?

No-one who has studied the health statistics of Nepal can doubt for a moment that improved water and sanitation have the utmost <u>relevance</u>.

The technical and management procedures developed by the Project office and the costs per head of the schemes executed lead the author to conclude that the work is being done <u>efficiently</u> and cost-effectively. However, corporate planning now needs to be introduced to ensure that the increasing demands likely to be placed on the Project can continue to be met in the same efficient way.

Achievements are described in terms of outputs, effects and impacts. The immediate outputs of the Project are most helpfully thought of as the trained staff in the Project office and the management procedures. On the water supply and hygiene education sides, staff are in place and procedures have been developed or are developing. On the latrine construction side, more staff have yet to be recruited. The mid-term effects of the presence of trained staff in the Project office and a developed set of policies and procedures shown in the construction, operation, maintenance and repair of appropriate water supply and sanitation projects. The author has no doubt that the Project is having considerable effect.

The boped for <u>longer term impacts</u> of the Project lie of course with improvements to the health of the people and here it is too soon to make any judgment. All that can be said is that provided hygiene education programmes can be established, there is every likelihood that the facilities being provided by the Project will have a beneficial impact on health.

5. RECOMMENDATIONS ON THE FUTURE OF THE PROJECT

5.1 Fundamentals

The author takes it as axiomatic that WaterAid does not seek to perpetuate itself as an organisation in Nepal, but wishes to build up appropriate institutions which will themselves have the capacity to promote and develop self-sustaining village water and sanitation projects.

5.2 Role of Project with Respect to SSNCC

Self-help co-operation with village communities is the key to self-sustaining projects. The path to this goal lies via the national voluntary organisations and the recognised vehicle for liaison and partnership with them lies through the Council. The Report therefore recommends that WaterAid continue to operate under the umbrella of the SSNCC and in close working association with its staff.

5.3 Technological Resource Centre

The senior management of the Council has very recently proposed that a Technological Resource Centre be formed. It perceives this as a district autonomous group under the umbrella of the council, from which NGOs can obtain expert professional management and technical advice when they need it, quickly and without bureaucracy. The Council has invited WaterAid to be a founding member of the TRC.

The author strongly recommends that WaterAid welcomes the Council's initiative to participate and offers to enter into serious negotiation on terms and conditions. These should include: a clear definition of management responsibilities; the financial independence of the TRC; a realistic staff salary structure; perception by NGOs of its independence; the TRC to have its own staff recruitment procedures; the ability of the TRC to decide its own day-to-day priorities, and the balance to be struck between fee income obtained from the international NGOs and local NGOs. These discussions will identify, the continuing level of financial support which WaterAid will need to provide.

5.4 Project as a Consultancy

Within the TRC, the Project will act as a consultancy and accept the technical, professional and financial disciplines of so doing. The author recommends that the following principles should guide the operation of this new NGO consultancy:

- * charges for services must be set at levels which will produce income sufficient to meet all the costs not met by WaterAid.
- * proper corporate planning procedures must be established to provide a clear connection between an accepted work load and the resources required to meet it.
- * the full acceptance of normal contractual, professional and financial disciplines and responsibilities to meet obligations to work to time and budget.
- * the continued professional development of all Project staff.
- * the continued development of systematic management and technical procedures.

Within the TRC, the Project could gradually move to a position where it was providing the technical resources for other groups to implement projects in the field, rather than seeking to do all the work itself as at present. It is realistic to expect the TRC to be set up by July 1991.

5.5 Policy Directions and Scope of Programme

The author recommends that, after due consultation with the Council, the Project within the TRC should adopt a number of clear policy professional guidelines. These should include:

- * Advocacy of the importance of hygiene education and sanitation as complementary inputs to water supply, with a view to an NGO implementing all the components
- * while remaining free to accept commissions from NGOs working in any area of Nepal, recognition that the cost-effectiveness of its field operation will be enhanced when projects are located in geographical proximity.
- * the services of the Project to be made available to any NGO able to pay for them.
- * although the Project is offering essentially a sectoral service, it would be willing to be involved in integrated rural development projects with appropriate NGOs.
- * formal and non-formal training should feature strongly as one of the services offered.
- * the Project will encourage the adoption of proved policy and field practices in the water and sanitation sector.

5.6 Corporate Planning

The demand for the services of the Project look set to continue to increase. For the effective and efficient use of limited resources, a proper corporate planning strategy needs to be established and the author strongly recommends that such planning become a regular feature of management of the Project.

Such a planning process will help to ensure that demands and resources are made compatible and that the full implications of field policies and work are understood and accepted by all concerned.

5.7 Management of the Project

The author believes that it is in the interest of long-term sound development for the Project to move to a position where it is managed on a day-to-day basis by a wholly Nepali staff, trained in the required professional, technical, financial and management skills. Nothing else in the long-term is sustainable. To recommend this is no criticism of Mr Lane, who has done a most impressive job in building the team up to its present position. However the inputs of any expatriate can only be for a limited duration and it is essential to plan ahead for an orderly transfer of responsibility.

One implication of this is that a Nepali engineer would need to be appointed who would report to the Nepali Project manager.

Obviously there are risks in proposing such changes, but the alternative is either to keep the work under direct WaterAid control or eventually to see it stop. The author does not believe that either of these alternatives is tenable.

5.8 Timetable for Proposed Management Changes

Mr Lane is scheduled to leave Kathmandu July 1991. The aim should be to have the new management arrangements in place and office staff used to working on a day-to-day basis under a Nepali manager without reference to a WaterAid adviser well before mid-1991. Thus a newly appointed Nepali manager should be in post well before February 1991. The author recommends that in the next twelve months Mr Lane moves in defined stages to the position of adviser.

The author further recommends that Mr Lane's successor (who will be appointed adviser and not engineer) should arrive in October 1990 and take over responsibility as adviser in February/March 1991. This would leave Mr Lane four to five months before his departure for intensive training of staff and updating of the standard management procedures. He could also work out with the manager and adviser the procedures to be used by the Project when it starts to act as a consultancy within the TRC.

The author suggests that Mr Collett or Mr King should visit Nepal in January/February 1991 to confirm the plans for management changes with the Council.

5.9 External Advice

The author recommends that the Project should consider retaining external advice (from within sources in Nepal) on :

- * the order and duration of the components of the programme required for hygiene education and latrine promotion and construction
- * the structure of a health impact study

* the development of programmes to teach Project staff to train others

5.10 <u>Technical Developments</u>

The Report makes a number of recommendations for further technical development. These include:

- * promotion of the technique of rainwater harvesting
- * manufacture in Nepal of the low head "plug" tap invented by Mr Lane
- * adoption of newer types of handpump in the terai
- introduction of a range of latrines for household and community use.
- * development of a much more robust tap capable of dealing with heads of up to 70 metres
- * development of a device to enable the heat welded joints in the HDPE pipe to be tested for leaks under pressure on site
- * systematic monitoring and feedback gained from the development and delivery of hygiene education programmes, and the experience of users with various types of latrines
- * the collection and analysis of capital and recurrent costs of water and sanitation schemes for circulation to other agencies in Nepal
- * the author suggested a design competition might be held for the new type of tap

6 RECOMMENDATIONS FOR WATERAID IN LONDON

The author's suggestions are grouped under four heads:

a) Preparation of staff - clearly the choice of the right person is the single most important decision WaterAid has to make and the author recognises there are limits to what can usefully be done before a person arrives on his overseas posting.

However he suggests that WaterAid should give more systematic preparation in four areas:

- * orientation on the country, its culture and political development
- * WaterAid's ethos, role and methods
- the management and planning of people, projects, programmes, budgets and guidance on how to cope on one's own
- * the analysis of training needs, development of training programmes and planning of staff development
- b) Management although the reports prepared by Mr Collett and Mr Bailey

showed considerable insight into the types of input needed in Nepal there was little written guidance available either for Mr Lane or the SSNCC about how the Project was to be implemented and developed. The author suggests a statement of objectives should always be agreed at the start of a project.

For historical reasons monthly reports are sent to Mr Collett, not Mr King, the Overseas Development Officer. It was felt in Nepal that this was not wholly rogical and increased the risk of inconsistent management responses.

The perception in Nepal is that there is comparatively little response from London to the regular monthly reports. However from London, an apparent lack of detailed guidance is viewed rather as evidence of trust of those in the field in allowing them the freedom to act as they see fit. Clearly this is a matter of balance.

At present the accounts for the office and field projects have to be sent back in full to London for verification. The author would propose that the Project office gets its accounts approved by a local accountant.

- c) Communication WaterAid engineers in Nepal had experienced a sense of isolation in particular phases in their work. The author strongly supports WaterAid's policy of telephoning their staff in the field at least once a month in order to maintain personal contact
- d) Technical Support WaterAid had not been able to arrange for the Engineering Adviser to visit Nepal at regular six month intervals and this had reduced the value of his advice. The Project has gone some way towards standardisation of management procedures and technical designs and the author considers it would be of value for these documents to be made available to other Water-Aid projects.

TABLE 1 Leading Health Indicators of Nepal

Infant Mortality (under one year)

11%

Mortality of Children (under five years)

16%

Life Expectancy

50 yrs for females (decreasing) 52 yrs for males (decreasing)

Population below

43%

poverty line

Average Caloric Intake

86% of requirement

Average Protein Intake

45% of requirement

Proportion of Children

7%

under 5 adequately

nourished

Common causes of

morbidity

Skin diseases, worm infestations,

enteritis and other diarrhoeal diseases,

infections, acute respiratory,

pheadaches, bacillary dysentery and

ameobasis

15 %...

Diarrhoea episodes in 6 per year children under 5 (average)

Deaths from diarrhoea among children under 5

46% of all child deaths

Children under 10 infected with worms 96% of total

TABLE 2 Water Projects executed 1987 - 1990

Type of subproject	Number	Population Served	Cost to donor(b) RsN	Cost per person RsN
Spring protection	40	2560	668000	261 (e)
Gravity flow	16	7100	3572000(c)	• •
Gravity rehabilitation	2	4300	349000	81
Hydraulic ram	4	1090	641000	588(g)
Tube well(a) (average depth 35m)	4 (186 wel:		1865000(c)	74
Hand dug well (average depth 14 m)	1 7 wells		217000(c)	86
Total	67	42670	7312000	171

<u>Notes</u>

- a) Bored by sludger method b) Includes material, equipment, transport, site overheads, design, surveys and supervision (excluding expatriate engineer).
- c) Projected figures for June 1990
- d) Maybe overestimated by up to 20%
- e)
- f)
- Range RsN 200 350
 Range RsN 300 750
 Range RsN 400 1100 g)
- h) £1 = RsN48