

Selected Aspects on the University System of Nicaragua

**Yolanda Rojas
Jörgen Dahlgren**

**Department for Research
Cooperation, Sarec**

Selected Aspects on the University System of Nicaragua

**Yolanda Rojas
Jörgen Dahlgren**

Sida Evaluation 98/13

**Department for Research
Cooperation, Sarec**

Evaluation Reports may be ordered from:

Infocenter, Sida
S-105 25 Stockholm
Phone: (+46) 8 795 23 44
Fax: (+46) 8 760 58 95

Authors: Yolanda Rojas, Jörgen Dahlgren.

The views and interpretations expressed in this report are the authors and do not necessarily reflect those of the Swedish International Development Cooperation Agency, Sida.

Sida Evaluation 98/13
Commissioned by Sida, Department for Research Cooperation, Sarec

Copyright: Sida and the authors

Registration No.: SAREC-1997-0163
Date of Final Report: April 1998
Printed in Stockholm, Sweden 1998
ISBN 91 586 7598 1
ISSN 1401—0402

SWEDISH INTERNATIONAL DEVELOPMENT COOPERATION AGENCY

Address: S-105 25 Stockholm, Sweden. Office: Sveavägen 20, Stockholm
Telephone: +46 (0)8-698 50 00. Telefax: +46 (8)-20 88 64
Telegram: sida stockholm. Postgiro: 1 56 34—9
Homepage: <http://www.sida.se>

Table of contents

	EXECUTIVE SUMMARY	1
I.	INTRODUCTION	5
1.	Objectives of the study	5
2.	Universities included in the study	5
3.	Sources of information	6
3.1	Interviews	6
3.2	Written material	6
4.	Limitations	7
II.	GENERAL ISSUES IN NICARAGUAN HIGHER EDUCATION	8
1.	State Financing	8
2.	Effectiveness and efficiency	9
2.1	Ratio between academic and administrative personnel	10
2.2	Careers offered versus student demand	10
2.3	Output and employment	11
3.	The university and the productive sector	12
III.	SPECIFIC ISSUES	14
1.	Modernisation and reform in selected Nicaraguan universities	14
1.1	The CNU programme	14
1.2	The impact of the programme	16
1.3	Modernisation and reform actions and proposal in selected universities	18
1.4	Relation between modernisation and reform proposals and current issues	20
1.5	The CNU proposal for the continuation of the modernisation process	21
2.	The situation and perspectives of academic personnel	23
2.1	The situation for academic personnel	24
2.1.1	Low salaries	24
2.1.2	Dedication of the professors to the university	25
2.1.3	Tenure for professors	25
2.1.4	Academic level of the professors	26
2.1.5	Formation of new professors	27
2.1.6	Academic career	28
2.1.7	Incentive system	28
2.1.8	Control of academic workload and evaluation system	29
2.1.9	Relationship between academic and administrative personnel	29
2.1.10	Staff development programme	29
2.2	Main implications	30

3.	Building institutional capacity for research in selected Nicaraguan universities	31
3.1	Research in Nicaraguan universities	31
3.1.1	Strategies, policies and priorities	32
3.1.2	Structures to support research	33
3.1.3	Procedures for the approval of a research project	33
3.1.4	Evaluation of research projects	34
3.1.5	Financial aspects with the respect to the development of research in the universities	34
3.1.6	International exposure: international meetings and publications	36
3.1.7	Researchers	36
3.1.8	Infrastructure	36
3.1.9	The research project in an institutional context	38
3.1.10	Post-graduate programmes	39
3.1.11	National level support for research	40
3.2	Main implications of the situation for research	40
4.	Relations between universities and the productive sector	42
4.1	The relations between universities and the productive sector	42
4.1.1	Careers with the highest enrolment	43
4.1.2	Research or extension programmes related to the productive sector	44
4.1.3	Income generating activities	47
4.2	Main implications of the situation with respect to the relations between universities and the productive sector	49
IV.	CONCLUSIONS	50
V.	RECOMMENDATIONS	51
1.	Areas in which universities are requesting support	51
2.	The orientation of co-operation	52
3.	Specific recommendations for co-operation	53
3.1	With respect to management in Nicaraguan universities	54
3.2	With respect to critical aspects relating to the improvement of conditions	55
3.3	With respect to building institutional capacity for research	55
4.	The implementation of co-operation activities	56

Appendixes

Appendix 1: Modernisation and reform actions and proposals in selected Nicaraguan universities

Appendix 2: List of persons interviewed

Appendix 3: Documents consulted

Appendix 4: Questionnaire

Appendix 5: List of Research Centres and Institutes

Appendix 6: List of Research Projects

Appendix 7: Post graduate programmes in Nicaraguan universities

Executive Summary

The higher education system in Nicaragua is presently undergoing a change with the purpose of improving both undergraduate and graduate programmes as well as research. Given the starting point for change, a number of serious general problems still remain.

Some of the more problematic areas are:

1. The financing system

According to law, Nicaraguan universities are entitled to 6% of the national budget. The amount annually allocated to the universities then depends on what is meant by the concept "national budget". This has been, and still is, a matter of dispute between the government and the universities. This dispute has diverted focus from relevant areas for change.

Regardless of how the 6% are calculated, the amount represents a fixed income for the universities as a group. This amount is then allocated between the universities in a process which reflects tradition and negotiating power, more than considerations of need or quality.

2. Effectiveness and efficiency

The budget allocation process contains no considerations for effectiveness or efficiency, nor is there any accountability for money received. University planning has understandably been based on an internal perspective which has resulted in both low effectiveness and efficiency.

The effects can, *inter alia*, be seen in:

- a very high ratio of non-academic to academic personnel
- careers that are neither adapted to student demand or ability
- an output of students who don't find relevant employment or leave the country after their education

3. Relation to the productive sector

In general, universities in Nicaragua still have very limited relations with the productive sector. Within the framework of such contacts it would provide the universities with a possibility to draw on the knowledge in other organisations and, even more important, provide a basis for developing programmes more adapted to society's needs. There is also the possibility that universities could provide services, which in turn could yield an income and improve upon the financial situation of the universities.

The CNU¹ has, financed jointly by SAREC and UNDP, together with the universities carried out the first step in a programme intended to introduce changes into the university sector. The programme had the following objectives:

- Strengthening CNU
- Design of an information system for the university and CNU
- Improve the systems for planning and evaluation in the universities
- Improve the administration of the universities
- Improve the financial control in the universities

The programme is considered to have been successful by the CNU, creating a common culture and platform for further development. The more substantial impact seems, however, to vary between the different universities and the programme has been most successful in those universities which were already in a process of change.

The CNU programme does not seem to be built on any clear change process model. The programme was most successful in its practical areas (information system, financial control system etc.) whereas the more theoretical parts presumably have had limited impact. Furthermore, the programme does not really focus the general problems of effectiveness and efficiency.

One of the main problems which was not addressed is the situation for the academic personnel. The low salary for professors and other teaching personnel, leads to a tendency to find work outside the university where one is employed full-time. Such a behaviour has of course negative consequences both for the individual performance and the function of the department in question. The situation is aggravated by the fact no control of work load or other evaluation system exists.

Too few professors seem to have a doctoral degree or do research. Tied to this is the fact that the universities also lack any academic career and that no incentive system exists for promoting quality teaching and research.

A university's fundamental activities consist of teaching and research. In general, research is still too rare and too dispersed. For academic personnel not working in special research centres, teaching is still by and large the only activity. No culture, no incentives and no time exists for doing research. In this situation, externally funded projects run the risk of deciding research priorities and also of research being restricted to the areas and the people financed by them.

The problem of creating institutional infrastructures for research has to be attacked not only by financing specific projects. In order to produce any effects, efforts have to be focused on the entire range of requirements. These include among others research being given equal priority to teaching, the design of a research strategy, a process for quality control of research projects, the quality of libraries, incentives for doing research, a policy of involvement of as many as possible, the publication of the results of research, national and international seminars and conferences. It has to be remembered that there is a close link between the quality of teaching and research.

¹ Consejo nacional de Universidades

A final aspect which needs to be addressed is the relationship between universities and the productive sector. By and large there is no tradition for close links and it is often assumed that productive sector looks at the universities with scepticism, a scepticism which was given further support by the latest dispute over the budgetary 6%.

There several aspects to this question. One vital such aspect has to do with the match between university programmes and the needs of the surrounding society. Today, most university planning seems to be driven by considerations which are internal e.g number and qualification of teaching personnel. Such a perspective, in its isolation, leads to a situation where the programmes offered are neither in demand from the students, nor do they give adequate employment opportunities. Although the relationship between the structure of the offered services and external demand is more complex in the case of universities compared to commercial companies, lack of an external perspective in university planning certainly leads to ineffectiveness.

Another aspect has to do with generation of financial resources. As has been mentioned before, universities pay very low salaries for the academic personnel and generally lack financial resources for doing research. On the other hand, universities possess knowledge which is valuable for organisations and companies in the universities environment. Given this situation, universities are well advised to improve upon their financial situation and therefore try to find ways of generating commercial revenue from the sale of services. Because of the weak financial situation for Nicaraguan industry in general, this support might initially be limited, but supporting the establishment and development of such linkages is certainly a well-worth focus for external aid.

The future support to Nicaraguan higher education ought be oriented in the following directions:

- Continued support to research. This aspect includes not only a continued support to specific research projects or PhD programmes, but also more general funds to "buy time" from teaching. This presupposes an adequate university structure for evaluating research projects.

The importance of institutional support has been stressed earlier but needs to be emphasised. The support to individual projects might lead to positive effects on the development of knowledge in a disciplinary context, but does not automatically provide any spin off effects on the surrounding organisation. If the ambition is to promote a more general research perspective in the universities, the support also needs to focus e.g the material conditions (libraries, Internet connections), incentive structures, the dissemination of results, quality control, the linkage between research and undergraduate and graduate programmes, the degree of involvement by academics etc.

- Infra-structural support to the continued development of better data systems and also development of indicators of performance. The infra-structural aspect also includes continued support to the development of libraries.
- Selective support to specific development projects in universities. As mentioned earlier, some of the universities are already by themselves in a process of change and have ideas and projects which could serve as a basis for learning in other universities.

For development on a national level e.g. a common statistical data system, support should be channelled to the CNU, but the rest of the support should be directed to each university on a project basis, based on an evaluation of each university's capability. Priority areas would be improvement of the situation for academic personnel, university management including indicators of performance, building institutional capacity for research and improving libraries.

As far as the process of change is concerned, based on the experience from the first phase of the CNU programme, it is recommended that projects for change have a practical rather than theoretical focus. It is also recommended that workshops, seminars and the like are organised to facilitate that experience from different projects is shared among the universities. The latter aspect could be made a requirement for support.

I. INTRODUCTION

1. Objectives of the study

According to the terms of reference, the purposes of this study were²:

- to provide an overview of the present system for higher education in Nicaragua
- to describe and assess the achievements of CNU and the universities towards a reform for the development of higher education and research in Nicaragua

The revision of the study done in 1994 by Brunner & Eduards, **Nicaragua: Higher Education and Research**³ and the situation we observed with respect to the evolution of higher education in Nicaragua led us to the conclusion that, rather than updating this report and prepare a second overview, it might be more useful to deepen the study of selected aspects: those that appeared to be most outstanding in terms of the future of higher education in Nicaragua. With respect to the assessment of the achievements of the CNU and the universities towards a reform for the development of higher education and research, we concluded that, since the Final Report on the Project⁴ was quite specific on the achievements of the project, we would orient our assessment towards the formulation of recommendations which could be help in future ventures towards the betterment of higher education institutions in Nicaragua.

2. Universities included in the study

Law No. 89 which grants autonomy to higher education institutions (April 4, 1990) recognised eight higher education institutions in Nicaragua: four public universities, two private universities and two agricultural-technical centres. Selected for this study were the six universities covered by this law. These universities offer the widest selection of career choices for students and attend to the needs of 34,969 students (84%) out of a total of 41,991 in 1994⁵.

Information was collected on these institutions, they were visited and their rectors, vice-rectors and other personnel were interviewed by the authors of this study. They all belong to the CNU (Consejo Nacional de Universidades) and the four public universities are beneficiaries of aid for research from SAREC. They are:

² See Terms of Reference 1997-06-15

³ Brunner, José Joaquín and Krister Eduards. Nicaragua: Higher Education and Research. SAREC. 1994.

⁴ National Council of Universities. Final Report on the Project NIC/92/031 "Support for the Process of University Reform and Modernization promoted by the National Council of Universities (CNU)". Technical Secretary of the CNU. Managua, January 1997.

⁵ Most statistical information used in this report, unless otherwise noted is taken from Consejo Nacional de Universidades. Información Estadística de la Educación Superior de Nicaragua 1985 - 1994.

- Universidad Nacional Autónoma de Nicaragua-Managua (UNAN-Managua)
- Universidad Nacional Autónoma de Nicaragua-León (UNAN-León)
- Universidad Nacional de Ingeniería (UNI)
- Universidad Nacional Agraria (UNA)
- Universidad Centroamericana (UCA)
- Universidad Politécnica (UPOLI)

In addition to the two technical agricultural schools mentioned (Escuela de Agricultura y Ganadería de Estelí y Escuela Internacional de Agricultura y Ganadería, EIAG), six other institutions have been authorised by CNU, according to the terms of the above mentioned law: five universities (Universidad Autónoma Americana, UAM; Universidad Popular de Nicaragua, UPONIC; Universidad Católica “Redemptoris Mater”, UNICA; Bluefields Indian and Caribbean University, BICU and Universidad de las Regiones Autónomas de la Costa Atlántica, URACCAN) and a technical center: el Centro de Ciencias Comerciales.

3. Sources of information

3.1. Interviews

Key resource persons were interviewed at each one of the six institutions included in the study, at the CNU, the Ministry of Education, UNDP and the Swedish Embassy. A list of these persons is included in Appendix 2.

3.2. Written material

A starting point for this study was the report made by Brunner & Eduards on higher education and research in Nicaragua.⁶ We were also provided with material on SAREC financed research in Nicaragua⁷ and scientific evaluations of SAREC supported research. Before the on-site visit to Nicaragua and the institutions, we also received the CNU evaluation of the implemented phase of the modernisation process.⁸

In Nicaragua we received ample material from each university, both descriptive and evaluative. The CNU has provided us with statistics and books which were part of the modernisation project. See Appendix 3.

In addition to the above, a questionnaire was sent to each university in our study (See Appendix 4); questions were included on the reform process, the situation for the teaching personnel, the role of research and the relationship between the universities and the productive sector.

⁶ Brunner, J J & Eduards, K: Nicaragua. Higher Education and Research, SAREC, 1994

⁷ SAREC: Research Cooperation with Nicaragua 1994/95-1995/96, 1995

⁸ CNU: Informe final sobre la ejecución del proyecto NIC/92/031 “Apoyo al proceso de reforma y modernización universitarias promovido por el Consejo Nacional de las Universidades”, 1997

4. Limitations

The Brunner & Eduards report contains a broad description of higher education in Nicaragua together with Latin American comparisons. Since much of the data remains valid today, we have tried to avoid repeating these facts in this report. Instead, we have concentrated on analysing aspects that we believe to be important but were not included in the Brunner & Eduards report. When relevant, we have also tried to update data in the Brunner & Eduards report.

Our onsite visit to Nicaragua was of less than two weeks in August 1997. During such a short period it is of course impossible to make a truly thorough scrutiny of the present situation and the reform process. We have tried, however, to improve the quality of the study as much as possible, using written material, interviews with persons not directly involved in the universities and using our pre-study knowledge of the Nicaraguan higher education system. All the interviews were taped in an attempt to make it possible to review the interviews at a later stage.

Although there has been an attempt to collect valid statistical information on higher education in Nicaragua, the information system is still to be refined and we have found discrepancies between the information made available by the institutions and that which is reported by the CNU; additionally, some of the information concepts are not quite clear. This can be reported as another limitation of the study.

II. GENERAL ISSUES IN NICARAGUAN HIGHER EDUCATION

The purpose of this section is to discuss some of the more important challenges that higher education in Nicaragua is facing. We do not propose that these are the only ones, but only that the issues discussed below represent important enough dimensions to merit further analysis and change. The issues covered are state financing, effectiveness and efficiency and relation between universities and the productive sector.

1. State financing

The system for financing higher education has been described in Brunner. Suffice it to say here that the formula for determining the allocation of resources to higher education is that these resources should equal 6% of the national budget. In 1996, according to government figures, this resulted in an amount of 198,2 million córdobas (\$20 million).

The calculation of the 6% has, for a number of years been a contested area. The CNU has e.g. for 1996 requested 280 million córdobas (\$28,4 million). The difference between the government's position and that of CNU is basically based on whether aid, donations, investment support and the like should be included in the base for calculation or not. According to the government's interpretation of article 125 in the Constitution, these amounts should not be included. The government's position is further that *"se ha beneficiado a la educación superior en detrimento de la educación básica"* (higher education has benefited at the expense of basic education).

Regardless of position in the dispute, it is obvious that the conflict has led to interest being diverted from other areas in pressing need of attention and which still need to be addressed.

After allocating the stipulated university resources to the CNU, the Nicaraguan government has no more influence on its further allocation or use. In this sense, the universities in Nicaragua are privileged compared to e.g. universities in Sweden. The Swedish system, where the allocation of resources is based on both the number of students admitted and the performance of these students, gives the government a substantial control over the activities of the universities. In addition, the government can, at will, change the amounts allocated per student and therefore maintain a control over total financial resources allocated. Each university in Sweden is then held accountable for the resources it has received, resulting in a comparison between budgeted commitment and outcome in terms of number of students and student performance.

The resources allocated to the CNU are in the next step further allocated to each respective university and other higher education institutions through agreements amongst the rectors. This allocation seems to follow a historical pattern closely linked to the budgeted amounts in previous periods. This leads to the conclusion that the university financing process in Nicaragua does not include any considerations for neither effectiveness nor efficiency of each respective organisation.

According to the information provided to us, the 1997 budget from January to May was allocated as follows:

<u>University</u>	<u>Percentage</u>
UNAN-León	17,8%
UNAN-Managua	30,7%
UCA	14,2%
UPOLI	5,4%
UNI	16,0%
UNA	8,4%
EIAG-Rivas	2,0%
EAG-Estelí	2,0%
URACCAN	1,9%
BICU	1,6%
Total	100,0%

2. Effectiveness and efficiency

Higher education, as a system, must achieve goals of both effectiveness and efficiency. Effectiveness in this sense has to do with the system's responsiveness and adaptability to the environment in terms of e. g. capacity and differentiation of supply. In education, an analysis of effectiveness focuses e g on the number of students who are admitted, the match between student demand for different programmes and the supply, the required knowledge to successfully go through a programme compared to student qualifications and, on the other hand, the relation between degrees granted and the needs of the labour market.

Efficiency considerations focus on the internal process in terms of how well admitted students successfully pass through the respective programmes in terms of quantity, time and cost.

The following sections discuss some of the more important areas in the analysis of effectiveness and efficiency in Nicaraguan institutions of higher education.

2.1. Ratio between academic and administrative personnel

Given the way the state's allocation of resources to the university sector is computed, the universities within CNU enjoy a fixed income as a group. The proportion of these resources that are devoted to education directly, is, *inter alia*, dependant upon how much of that is allocated to cover indirect costs. Since in universities the cost for personnel is the single largest item in the budget (65-80%), the cost for indirect personnel also tends to be the largest item of indirect cost. The more indirect personnel, the less goes to direct cost for the programmes.⁹

From the statistics gathered by CNU, it can be seen that the ratio between indirect personnel ("personal no docente") and direct personnel ("personal docente") is on average 1,4. This means that for every direct teaching individual, there are almost 1,5 persons to support him/her. Although no university can operate without support by indirect personnel, this seems to be a very high proportion. As a comparison the figure for a university in Sweden is 0,6. This is of course not a suggestion that no contextual differences exist between Nicaragua and Sweden. The ratio is, however, useful as it points to an area for rationalisations, leaving more resources to direct teaching.

2.2. Careers offered vs. student demand

The task of strategically deciding what programmes and courses a university should offer is a difficult one. One basis is clearly the capacity and competence each university possesses. Planning a university's supply of education solely with such an internal perspective leads, however, to a university isolated from its environment where the programmes and courses are not in line with the demand of the surrounding society. The consequences are normally that demand for some programmes and courses is less than the supply, some programmes and courses also have too large a demand and a number of students leave the universities without finding relevant employment.

Another vantage point is student demand. The idea is that the university supply of programmes and courses should reflect student demand. Although a complete match between education supplied and student demand is neither attainable nor desirable, a planning which ignores this dimension is clearly inadequate. University strategy must, *inter alia*, be based on not only what students demand, but also the quantity of students and their qualifications. We have no statistical evidence describing the present situation in Nicaragua. From our interviews we have, however, learned that it is common that the demand for some courses and programmes is too large while others have problems of attracting the expected number of students. We have also understood that the qualifications of the admitted students sometimes do not attain the levels required in the course planning, something which has triggered off the introduction of a number of remedial courses to compensate for the lack of necessary knowledge.

⁹ The term indirect does not imply any value judgement as to the tasks performed by this personnel. Indirect personnel perform all kinds different necessary jobs like accounting, technical support, library services, cleaning etc.

Both these phenomena lead to inefficiency in the utilisation of scarce resources. The university in León plans to introduce a system where every qualified applicant is admitted. University studies then start with a common first year (año común), during which the student is expected to develop a clearer view of his or her interests and capabilities in order to be able to make a more well-founded choice of career. It seems to us, however, that this idea, although sensible in many respects, only introduces new financial and organisational burdens, without leaving any guarantee of attaining a better adaptation to student demand and capability.

A final basis for strategy is the demand in the labour market. The purpose of planning for this dimension is to achieve that degree students find a relevant employment after their university studies. This aspect will be covered in the following section.

2.3. Output and employment

As pointed out in the Brunner report, when it comes to measuring the output from academic studies, one has to distinguish between "graduados" and "egresados". The former leave universities in possession of a degree, while the latter leave without degree, not as drop outs during a programme, but with most of the requirements fulfilled. The reason for leaving as "egresado" is sometimes financial problems, but in many cases it is connected with the problems involved in carrying out an independent thesis work at the end of the programme.

According to the Brunner report 1.766 graduated between 1990-91 from institutions of higher education. During 1996 the corresponding figure for the CNU universities alone was 2.331, which indicates a substantial increase. The ratio of graduates to total enrolment was 1:16 compared to 1:17 in 1991 (Brunner). This ratio varies between universities. UCA has e g 1:8, while the ratio for UNAN-Managua is 1:20.

Compared to this, the number of "egresados" was 4.810. Adding these to the number of "graduados" as a measure of the total output means 7.141 leaving the universities in 1996.

While studies take longer than standard time to complete an even worse problem seems to be the total lack of relation between careers chosen and degrees taken on one hand and the demand of the labour market on the other. There does not seem to exist any reliable statistics on how many students find an adequate and relevant job after completion of their studies. Some professional programmes like medicine and law have an established national market. However, according to our interviews, many students seem to leave the country after the completion of their studies. In reality this means that Nicaragua is paying for benefits that are enjoyed only by the individuals and/or the country they move to. In other areas, however, the national market is not large enough to absorb the output from the universities, something which leads either to the individuals taking a job which does not correspond to their education or to

outright unemployment. At the same time Nicaragua, in other areas, lacks professionally trained people.

An example of this is law. There are presently 14 law faculties in Nicaragua. Most of these offer traditional law programmes with excess demand and, given the number of programmes, produce too many lawyers, some of which find their employment abroad. There is simultaneously, however, a lack of programmes within e.g. *derecho financiero mercantil* (business law), *derecho comercial internacional* (international business law) and *derecho internacional* (international law).

In teacher education, on the other hand, there is a national lack of qualified teachers, while at the same time the universities do not have a sufficient number of applicants to the corresponding programmes. This has of course, among other things, to do with the salaries teachers receive.

3. The university and the productive sector

Universities have often traditionally taken a position in relative isolation from the surrounding society. This statement is primarily relevant for Arts and Social Science, whereas e.g. Engineering and Medicine have, by nature of their disciplines, maintained a closer contact, although it is still uncommon for students of medicine to meet patients until the latter part of their programmes.

The reasons for and benefits of a close contact with the productive sector are several:

- The relations with companies and organisations outside the university provides an opportunity for the university to gather information about the labour market demand for different competencies. This information could then be fed into the university's own planning process. Again, the university cannot and should not strive to unilaterally map the short term demand in the labour market, but planning which disregards these considerations leads to an ineffective system.
- The contact with the productive sector can be used actively as an integral part of the curriculum. This gives the students a possibility to reflect on the theoretical knowledge by contrasting it with empirical observation and experience. In concrete terms this can include internships, live cases, guest lectures by people working in companies and organisations etc.
- The contacts with organisations and companies from the productive sector also give the students a chance to form a more well-informed choice as to their future career.

Furthermore, the productive sector can benefit from university research and development through service and extension programs that can generate income which can be of benefit for the university and its professors.

During our interviews we have come across general mission statements about serving societal needs such as "...*la contribución a la transformación de la sociedad...*"(UNAN-León) or "*nuestro lema de Servir a la Comunidad*" (UPOLI), and also attempts to create both arenas for the exchange of information (UCA) and ideas as well as more concrete co-operation involving student projects together with outside organisations (UPOLI). We believe, however, that the full potential of these relations stills remains to realised. More on this topic will be developed in the next section.

III. SPECIFIC ISSUES

1. MODERNIZATION AND REFORM IN SELECTED NICARAGUAN UNIVERSITIES

The purpose of this section is first to describe the programme to support the reform process carried out by the CNU for its member universities and other higher education organisations. The possible impact of the process is then discussed together with the new CNU proposal for a continued reform process. A general analysis will be included on the basis of the reforms implemented and plans for the future of the selected universities during the last 4 years. A specific account on these matters for each institution is presented in Appendix 1.

1.1. The CNU programme

In September 1994 UNDP and SAREC agreed to jointly finance a CNU initiated project for reform in higher education, the planning of which had started already in 1992. The programme that was finally agreed upon had the following objectives:

- Strengthening CNU
- Design of an information system for the university and CNU
- Improve the systems for planning and evaluation in the universities
- Improve the administration of the universities
- Improve the financial control in the universities

The activities designed to attain the objectives were the following:

Strengthening CNU

- Dr. Carlos Tünnerman was employed as a principal consultant in the planning, implementation and evaluation of the project.
- The project also paid for a minibus, computers, Internet connection, a local network, a programme for managing databases, the redecoration of the premises and the creation of a meeting room with relevant technical equipment at the CNU office in Managua.

Design of a common information system

This objective included an ambition to introduce automatic information systems for all major information services in each university.

The activities included an agreement with CRESALC¹⁰ to undertake the following:

¹⁰ Centro Regional para la Educación Superior para América Latina y el Caribe

- Develop a proposal for an information system for registration and other student related information needs
- Develop a proposal for a system to gather, process and distribute statistical data on higher education in Nicaragua
- Develop a proposal to improve the services of libraries, archives and other centres of documentation through development of systems and training of personnel
- Develop a proposal to install communication systems in each university, at the national level and with connections to Internet.

The courses to improve the services of libraries and other information centres attracted 142 applicants from 14 institutions plus the National Library. These courses also introduced a software programme called Microsis.

As a result of the project, general information on higher education in Nicaragua during the period 1985-94 was collected for 12 institutions¹¹. A manual was produced for the continued information gathering process.

In the evaluation of the entire project¹² all the activities are regarded as having attained each objective respectively. However, no information was made available on the information system for student registration and other student needs. The fact it is included as one of the objectives of the new project makes us think it was not implemented. The report also stresses the ambition to create a "cultura informática" in higher education.

Improving systems for planning, evaluation and administration of universities

Objectives number three and four were merged into one objective. Nine courses were offered in three sessions by la Universidad de los Andes. The courses were:

- Teoría de la universidad
- Administración y Gestión de la Cooperación Internacional
- Administración Financiera y Financiamiento de la Educación Superior
- Administración Superior
- Planificación Curricular
- Evaluación Universitaria
- Planificación Universitaria
- Modalidades no tradicionales de enseñanza
- Administración de Recursos Humanos

¹¹ No data is available for BICU and URACCAN

¹² Informe final sobre la ejecución del proyecto NIC/92/031 "Apoyo al proceso de reforma modernización universitarias promovido por el consejo nacional de universidades.", CNU, Managua, 1997

Each course had about 50 participants which were mainly university administrators. For each of the nine courses, separate material was produced.

Instead of the originally planned workshops, CNU initiated a "Escuela de Verano" both in 1995 and in 1996. The areas covered in 1996 were:

- Situación actual y Perspectivas de la Educación Superior en América Latina
- Evaluación institucional
- Cooperación internacional
- Política educativa nacional
- Cultura Informática y Educación Superior
- Educación superior a distancia
- Diseño curricular
- Dimensión Internacional de la Educación Superior

These courses were to be repeated in each one of the participating universities by the persons that attended at the national level, however, it was reported that this did not take place.

Improve financial control in universities

The consulting firm PRICE WATERHOUSE was retained to develop a financial control programme based on discussions with people in the universities. A workshop to introduce the programme was organized in September 1995.

1.2. Impact of the Programme

The total impact of any programme is always difficult to assess since many effects are not discernible in the short run and can also be unconscious. According to the evaluation made by the CNU, the project is considered to have reached its objectives.

Based on the material we have collected and the interviews we have made, our opinion is that the project has attracted a great deal of interest, participation and support from the universities. The project can be seen as a first step in creating a common culture for change. As a whole, however, the effects seem to be unevenly distributed among the universities.

On a CNU level, the programme has accomplished a strengthening of the CNU and statistical data on university education were collected, not only for 1985-94, but also later for 1995-96. Such data is a *sine qua non* for obtaining an overall picture of university education as a basis for planning and identifying areas of concern. The ambition to establish modern connections via e-mail and Internet still remains, however, to be implemented

The financial control programme developed by PRICE WATERHOUSE was possibly *per se* valuable. The consulting firm had, however, not acquired the right

to the necessary software for its implementation. Each university interested in its implementation, has had to pay for the software and also spend additional resources in adaptation to each organisational context. Only a few have done this e.g. UNAN-León. UCA, UNI and UPOLI are attempting some adaptation.

The curriculum development part of the programme seems to have sparked off an interest in many universities. In our interviews we were often told about the work that was presently going on in this area and of attempts to implement self evaluation techniques. This is of course a process that takes some time and no immediate results can be expected.

As to the attempt to address the need for the development of university administration, this seems to have led to limited progress. This should not be a surprise because the method chosen, courses on university administration, does not easily produce changes in management structures of organisations. Furthermore, the texts produced for this area seem on the whole to be theoretic and do not immediately translate into practical actions.

It is our view that some of the universities e.g. UCA, UNAN-León and UPOLI, more than the others have tried to take advantage of the project and implement some of the ideas. These universities, however, seem to have been involved in a change process already and had therefore committed themselves to the need for change. By participating in the project they could get new input to areas which they already had targeted for change.

As a whole we think that the activities in the project were not based on any clear model of how to produce organisational change. The entire approach seems to be too cognitive and theoretical with limited concrete elements. We believe that in starting a change process in this context, one should focus on how to relate the overall ideas into practical improvement. We also believe in the importance of working with a model for the change and learning process where each participant organisation can learn from each other.

In synthesis, the impact of the previous project seems to be different depending on the actions implemented, for example:

- a) General courses: it is the opinion of persons interviewed in the universities that, some were more useful than others. Among the most useful: institutional evaluation and curriculum design were mentioned. With respect to the other courses, the general opinion was that they helped “change the culture” of the persons who participated in the sense that they made them aware of general tendencies in university management that are current in other countries. This process has made it possible for people in the universities now to be open to important aspects to be dealt with in the future such as strategic planning, institutional evaluation, curriculum change, relations between the university and the productive sector.
- b) Specific actions implemented in a specific area which lead to visible results: the modernisation and automation of the library system was mentioned and so was, although it was incomplete, the financial administration proposal

developed by Price Waterhouse. In these areas, there are specific and visible products in each university which has in turn led them to continue with the process. For example, with respect to the financial administration proposal, they have assumed on their own, the adaptation to their own situation, even at the cost of hiring the computer specialist needed to develop the proposal. With respect to the modernisation and automation of the library system, they are convinced that the way to continue developing along these lines.

- c) Follow-up at the level of each one of the universities: there was a general opinion that follow-up in terms of university modernisation and reform depended on each one of the rectors. There were rectors that had not only followed-up at the level of their universities but the actions held at CNU had been useful in terms of the university reform actions they were already undertaking in their own institutions. Such is the case of UNAN-León, UCA and UPOLI. There were other rectors where this follow-up is much more difficult to perceive: UNAN-Managua, UNI and UNA.

1.3 Modernisation and reform actions and proposals in selected universities

As mentioned previously, the different universities have approached modernisation and reform actions in different ways. A general characterisation of the reform processes at the institutional level could be synthesised as follows¹³:

- UNAN-León has approached reform through a total quality model, defined mission, objectives and strategy as well as specific reform actions. It has been preparing a model and instruments for an evaluation of the work it is doing in order to make the necessary changes to reach its goals without neglecting practical changes that facilitate the work of the university such as the modernisation of the library and financial systems with the support of the CNU programme. Plans for the future include the continuation of the reform process that is underway.
- UCA has undergone radical changes focusing particularly on administrative reforms to define a new university structure and others dealing with a reconsideration of its personnel management policies and on curriculum reforms leading towards overcoming very practical problems dealing with the content and duration of the different careers. Part of the reform process has also been a review of the university's mission, objectives and principles which have now constituted the guidelines for other reforms. It has also been careful to put into effect other practical changes to reinforce its library system and curriculum reform. Plans for the future are in accordance to the mission stated and includes evaluation of programs and develop more efficient management procedures.
- UPOLI has approached reform through the introduction of very specific and practical actions which have rather focused on the creation of new career

¹³ For more specific information see Appendix 1.

opportunities, new research and training institutes, the establishment of a music conservatory, the establishment of regional centres and of distance education programmes as well as strengthening the library system and communications through e-mail and Internet. Plans for the future include the construction of library and sports facilities and the improvement of management systems in general.

- UNI has focused its attention on curriculum development and reform which has led to the inclusion of a humanistic component in the technical careers as well as the introduction of new areas such as Informática Educativa and Urban Planning. In the future it hopes to continue curriculum reform, the formulation of a strategic plan, the revision of university rules and regulations and a self evaluation process as well as to develop a plan for investment in infrastructure, technological equipment and libraries.
- UNA has concentrated efforts on three areas: internal organisational development through the definition of mission, objectives and principles as well as betterment of administrative and financial management; institutional development, especially through UNA's participation and membership in national and international organisations and academic development including curriculum reform, definition of research goals and strategies as well as external activities. In the future it plans to continue developing the above mentioned areas.
- UNAN-Managua is undergoing a revision of the rules that govern academic life, developing instruments for evaluation, introducing new programs, increasing postgraduate courses and working on the automation of library and communication systems. For the future, it plans the approval and implementation of new university statutes, the formulation of a strategic plan, the implementation of curriculum reform, the development of instruments for evaluation and other specific tasks.

It is important to indicate that actions are at different stages of development and it was not possible for us to be able to assess the degree of implementation and impact they have had at each one of the institutions. Rectors and other management personnel explained what they had done and planned to do. Through this and the documentation received it is possible to say that some of the institutions have more clarity than others with respect to the model they are following, the goals they want to pursue and the actions to be undertaken at the institutional level; in other cases, the process appears as a set of non- integrated actions. Much of the advancement of the reform process in each institution has been dependent on the leadership of the Rector and other management personnel. CNU programme support has been more meaningful in the measure it has been a contribution to the institutional project and it is certainly an important aspect to consider in future support.

1.4. Relation between modernisation and reform proposals and current issues

There are many issues that need to be addressed in order to develop and improve universities in Nicaragua. The need to develop systems for information and management is of course one such area.

We believe, however, that there are even more important problems which are readily identifiable without any further analysis. In general they have to do with the effectiveness and efficiency of the system. The areas for concern are:

- judged from the use of remedial courses, many students do not seem to meet the qualification criteria for university studies
- there is a lack of match between the courses and programmes that universities offer and student demand. Compared to the supply, too many students want to enter certain careers (e g law), while others (e g teacher education) do not attract students enough to fill the programmes or courses
- there is a lack of match between the number and type of degree students the universities produce and the needs of the labour market. This results in a brain drain to other countries, employment in areas of little relevance in relation to degrees taken or programmes completed and in outright unemployment.
- university studies are in many areas inefficient. Too many students drop out, the through-put time is too long compared to standard time, a large number of students leave without degree. All this leads to a too high a cost per degree student.
- it is a widespread opinion that too little research is carried out at the universities.

Although we believe that the new proposed CNU programme focuses on areas of importance, we can not see how the above-mentioned problems, which we find should be at the centre of interest in university development, can be addressed in this way.

In the following section we will also stress the importance of the situation for the teaching personnel ("personal docente"). It is through this personnel that change has to be implemented and they are therefore a crucial component in any change process.

1.5. The CNU proposal for the continuation of the modernisation process

Given its positive evaluation of the first university development project, the CNU has decided to launch a continuation. This project has the following 10 objectives¹⁴:

1. Continued strengthening of the secretariat of CNU

This includes giving administrative support to the next phase, but also continued publishing of statistical data on higher education in Nicaragua. Other activities included are the dissemination of instruments for evaluation and accreditation and the hosting of academic, scientific and cultural events to improve higher education.

2. To produce a strategic plan for the development of higher education

The activities in this area focus both on the individual university and the entire higher education sector. At the university level, each university is to set up a group which should receive training and develop a strategy for each university respectively.

3. The development of a registration system for students

This includes seminars and workshops for registration personnel, development of manuals, design of an automated registration system and acquisition of technical equipment. Included is also training of personnel on the registration system.

4. The development of library services

The activities in this area consist of the development of an information system for libraries, archives etc. It includes also the acquisition of technical equipment and the installation of connection to Internet. This is followed by training of personnel.

5. The development of a national accreditation system

The plans are to establish a Comisión Nacional de Evaluación y Acreditación Universitaria. Legal mechanisms for introducing and maintaining a process for evaluation and accreditation should be established.

Instruments for evaluation and accreditation are to be developed.

¹⁴ Continuación del "Apoyo al proceso de reforma y modernización universitarias promovido por el Consejo Nacional de Universidades.", CNU, Managua, 1997

6. To promote research to the same position as teaching in the universities

The activities for this objective include seminars and workshops on the present situation in the universities, activities to increase the scientific level of the teaching personnel and promote exchange of experiences between the universities.

It is proposed that each university establishes a Scientific Council.

7. To improve the professional level of management and academic personnel of the universities

This objective is to be attained by the organisation of courses in an Escuela de Superación Universitaria. A Masters Degree in University

Management is further to be established. Finally, visits to universities abroad should provide input for the participants.

8. The development of a plan for distance education

A pilot project, under the direction of CNU, should be started in distance education. International experts are to be called in within specific areas and visits to pioneering countries are to be organised. Courses need to be developed as well as teaching material. Finally there is a need for technical equipment.

9. To organise a programme for specialised formation in the field of the basic sciences and other fundamental disciplines.

Four hundred professors from the different universities will be trained in the didactics of mathematics, physics, biology, social sciences, Spanish, chemistry, English and computer science.

The laboratories within Physics, Chemistry, Biology and Languages are to be reviewed and if necessary improved. A Centro de Cómputo is to be established for the basic disciplines within each university.

10. Improve the administration of the universities

The activities include, among others, the acquisition of the necessary codes for the programme proposed by Price Waterhouse and seminars on university control systems.

Determining of indicators on efficiency and development of models for determining cost per student and develop a cost accounting system to increase effectiveness.

Finally, mechanisms for evaluating employee performance should be developed.

We believe that, as a strategy for change, the continued process needs to be characterised by a focus on **concrete changes at local levels supported by systemic measures at a central level**. Workshops should be used as a method and the exchange of ideas and experience within and between universities should be stimulated.

As far as we can understand, changes are already under way in some of the universities and it is important that these changes be supported. A central factor here is the existing management. Without a management devoted to change, any measures will only produce cosmetic effects.

We have previously presented some of the vital issues for the universities of Nicaragua. The new CNU programme, being a programme based on a central perspective, only addresses some of these issues. We believe however that within this perspective the continued strengthening of the CNU, the development of information and registration systems as well as the development of libraries represent very important areas. However, the other objectives like the development of a university strategy, improvement of university administration, the development of an accreditation system and the development of a plan for distance education seem less likely to produce the necessary changes. The objective to promote investigation to the same position as teaching, although commendable, remains more of a wish, since it requires, for its attainment, important changes in each university's situation with respect to the academic personnel. This aspect will be covered in the next section of this report.

2. THE SITUATION AND PERSPECTIVES OF ACADEMIC PERSONNEL IN SELECTED NICARAGUAN UNIVERSITIES

Most higher education institutions spend between 70-80% of their budget in the salaries of their academic personnel. The fulfilment of the objectives of higher education institutions and the concern for delivering programmes (teaching, research, extension) characterised by academic excellence depends to a large degree on their academic personnel. Because of this, we believe the analysis of key indicators which can help us characterise the academic personnel of the selected universities is of crucial importance to the analysis of the state of higher education in Nicaragua.

Personnel is a strategic topic: if higher education institutions cannot count on well prepared and committed academic personnel, improvement of other conditions may help but certainly not guarantee academic excellence and adequate delivery: of graduates that will join the labour force; of research that can contribute to the advancement of knowledge and to the solution of the problems of the country and of high quality extension programmes.

Some indicators which can give us an idea of the situation of academic personnel in Nicaraguan higher education institutions will be analysed. It is clear, however, that for a more thorough analysis an in-depth study of this issue is necessary.¹⁵

2.1. The situation for academic personnel

2.1.1 Low salaries¹⁶

Salaries vary somewhat from one university to another but in general, they are very low. The highest salary for a professor having a postgraduate degree and 3-5 years experience ranges between US\$ 360-380 for a full time professor at the public universities (UNAN-Managua, UNAN-León, UNI, UNA). The lowest salaries range between US\$ 180 and US\$ 116 at the public universities, including different categories (even professors that do not have university degrees - “egresados”).

The situation is different in the two private universities. UPOLI pays lower salaries, the highest being US\$ 303 and the lowest professor salary (does not include other personnel as in the other universities) is US\$ 218.

UCA has recently undergone an academic personnel reform process which has implied that the full time personnel really works 40 hours a week at the university and obtain higher salaries. Regulations are established for two other categories of personnel: personnel hired by the hour but on a more permanent basis (stability for 2 years) and personnel hired by the hour every semester. Highest ranking salary at UCA for a professor with a doctoral degree is US\$ 810 and for a licenciado it is US\$ 729. The rationale behind this reform aims at the constitution of a core group of professors fully dedicated to the university - not only to direct teaching; those that work by the hour also receive a higher salary than in other institutions and are expected to do exactly what they are hired for. The difference established with other universities has been a polemic issue.

¹⁵ Important to note in this section: the data used in this section comes from both the CNU and the universities (answers to questionnaire) and reveals that there are discrepancies between the information given directly by the universities and the information which appears in the statistics compiled by the CNU. Also, with respect to the degrees obtained by the professors, some refining needs to be done, and agreements reached as to what is going to be commonly understood, as to what is understood by a doctoral degree for example. There are universities, UNAN-León, for example, whose interpretation coincides with international standards (doctors are those that have obtained an academic doctoral degree); however, other universities such as UNAN-Managua, apply the popular Nicaraguan concept, for example that lawyers and medical doctors are called “doctors” even if they do not have academic doctoral degrees.

¹⁶ Information provided by the universities (questionnaire).

2.1.2 Dedication of the professors to the University

At the public universities, between 60% and 90% of the professors are nominally full time professors. Between 12% and 17% are part time professors (half time, fourth time...) and between 6% and 25% of the professors are hired by the hour. UNI and UNA have the highest percentage of full time professors (more than 80%).

At this time there is no information on personnel matters from UPOLI. UCA, because of the above mentioned reform has a very different situation: 21.9% of their professors are full time while 78% of the professors are hired by the hour.

Nevertheless, although in the public universities there is a high percentage of professors that are hired on a full time basis, this is only a nominal situation. The fact is that these professors have to be present at the university during their direct teaching commitments and this means, in the public universities, 12 hours direct teaching per week. It is a known fact that these professors work in other institutions (teaching at other universities or schools) or on their own (professional offices or consultant services) the rest of the time in order to be able to obtain a better salary. Universities do not gather specific information on the professors that work in other institutions and what types of jobs they do, although everyone knows this is how it works. Therefore, the only institution where full time means full time is UCA.

2.1.3 Tenure for the professors

Most professors at the universities have tenure: the full time professors certainly do; the professors hired by the hour seem to acquire tenure (at least from the information received from one public university) after having been hired for two continuous semesters. This is an aspect which should be taken into consideration when planning personnel development for the future although it should be combined with other variables such as age and degree of the professors who have tenure. This fact can have both positive and negative implications which should be considered.

2.1.4 Academic level of the professors

The situation at the different universities is the following:

	DOCTORS	MASTERS	SPECIALISTS	LICENCIADOS
UNAN-Managua	120* (19)	11	100	250
UNAN-León	40	106	108	284
UNI	13	72	22	218
UNA	3	37	55**	53
UCA	6	75	-	203
UPOLI	No information	No information	No information	No information
TOTAL	81***	301	285	1008

* 101 of them belong to the Faculty of Medical Sciences which means they probably do not have an academic doctoral degree but are medical doctors that are academically equivalent to “licenciados”.

** Engineers

*** Does not take into account the medical doctors.

There is additional personnel who are “egresados” or “técnicos” who do not belong to any of the previous categories.

The analysis of the above situation could be carried further in terms of where they obtained the postgraduate degrees and what their area of specialisation is. For example, it would be important to know what percentage of the professors who hold a masters degree have graduated from Nicaraguan universities and what percentage has graduated from foreign universities. With respect to their area of specialisation, this would also be important information in terms of the impact that they can have in a specific programme at the university. For example it makes a difference if, in a specific department or faculty there are several professors holding a doctoral or a masters degree or if these professors are spread over different departments of the institution.

With respect to this last point, the following information might be indicative:

- a) At UNI, out of the 13 professors that have a doctoral degree, 4 of them are in the Faculty of Construction Technology and 3 in the Science and Systems Faculty. Out of the 72 professors with a masters degree, 10 are in the Faculty of Construction Technology, 19 in the Faculty of Electrotecnia and Computer Science and 15 are in the Faculty of Science and Systems. Clearly, there is a good concentration of professors with postgraduate degrees in the Faculty of Construction and Technology and in the Faculty of Science and Systems.
- b) At UNAN-Managua, out of the 120 doctors reported by this institution, 101 belong to the Faculty of Medicine. Of the 20 remaining, 12 belong to the Faculty of Educational Sciences and Humanities. Out of the 114 professors with masters degrees, 47

belong to the Faculty of Educational Sciences and Humanities, 22 belong to the Faculty of Medical Sciences and 21 belong to the Faculty of Sciences. Clearly, the Faculty of Educational Sciences has a good concentration of professors with postgraduate degrees.

c) At UNAN-León, out of the 40 professors with doctoral degrees, there are 14 in the Faculty of Sciences (there are 2 more in administration which, apparently, belong to this same Faculty) and 13 in the Faculty of Juridical and Social Sciences. Out of the 106 professors with masters degrees, there are 28 in the Faculty of Sciences and 28 in the Faculty of Educational Sciences. In the Faculty of Sciences there is a clear concentration of professors with doctoral and masters degrees.

d) At UCA, out of the 75 professors with masters degrees, there are 16 in the Faculty of Administrative Sciences, 15 in the Faculty of Agricultural Sciences, and 13 in the Faculty of Humanities.

e) There is no relevant information for UNA.

f) There is no information available for UPOLI.

The above statistics are important in terms of identifying which programmes in each one of the universities are stronger and which are weaker. This can be useful from two perspectives: a) continue to support those programs that are stronger in order that they become stronger academically, or b) support those that are weaker in order that they might improve their academic profile.

This situation might also be considered in terms of strategy for the Nicaraguan Higher Education System (universities belonging to the CNU). Postgraduate programmes serving other universities might be strengthened in those universities that have the best academic conditions.

Finally, this is important information in terms of decisions as to the formulation of a plan for the formation of new professors for the universities, nationally or abroad.

It is to be noted additionally that there is not necessarily a direct relationship between the academic level of the professors and research.

2.1.5 Formation of new professors

At the present time, 5 of the 6 Nicaraguan universities considered in this study (no information on UPOLI), have 33 professors studying in order to obtain a doctoral degree, 132 professors studying in order to obtain a masters degree and 44 professors studying in order to obtain a specialist degree. There is no information available as to what are their academic speciality areas are or if they are studying in Nicaragua (masters and specialist degrees, for example) or abroad, and in which institutions.

One university mentioned that the majority of the professors that went abroad to study on scholarships obtained through the university, did not return to the country or returned to work in other institutions and suggested that more rigorous and demanding selection mechanisms be established and suggested that, in addition to selection mechanisms, labour contracts could also be established.

2.1.6 Academic career

All of the institutions indicate they do not have an academic career as such. There are different categories of professors whose placement in one or the other category only considers aspects such as academic degree and seniority. There is no academic career which considers academic requisites as such: academic degrees, results of performance and evaluations, research, publications, languages and other criteria in order to move from one category to another.

2.1.7 Incentive system

There are no incentive systems for professors in any of the Nicaraguan universities although there is concern for this issue in some institutions. Examples of incentives sporadically mentioned by the different universities are: a very modest bonus at Christmas time, scholarship opportunities for specialisation courses, short visits to other universities, opportunities to participate in the sale of services in order to receive additional money through flexible schedules, reduction of the teaching load in order to do research, some economic recognition for seniority, labour risk bonus (for scientists, for example) and eye glasses for professors.

In academic institutions in other countries, incentives are usually linked to academic standards and merits, as well as to the academic career regulations. However, if there is no academic career as such in Nicaragua, and no evaluation of academic standards and merits, it is understandable that an incentive system has not been developed and the types of incentives mentioned are not linked to the concept of improvement: personal or institutional.

2.1.8 Control of academic workload and evaluation systems

From the information we can conclude that most institutions do not have a system for controlling the academic workload of the professors, nor evaluation systems of their performance. The only example of this type of control of the academic work load or work plan of the professor comes from UNAN-León. There are also plans, at UNAN-León, to establish an evaluation system. UNI has also informed that they do control the academic workload of the professors.

2.1.9 Relationship between academic and administrative personnel

This issue appears to be critical. It is related to the concept of efficiency which, at this time is being debated in Nicaragua in relation to the budget assigned by the government. There is a disproportionate number of administrative personnel in the universities. Administrative personnel is usually full time personnel.

If one compares the number of non-teaching personnel (full time) with the number of full time professors at each one of the universities included in this study, the situation is as follows:

	NON TEACHING PERSONNEL	FULL TIME TEACHING PERSONNEL	TOTAL NUMBER OF PROFESSORS
UNAN-León	481	334	478
UNAN-Managua	687	426	822
UNA	281	157	171
UNI	354	214	295
UCA	202	62	267
UPOLI	No information	No information	No information

The information speaks for itself. This is certainly an area for reform. The proportions of administrative personnel are, in any case (full time professors or total numbers of professors), extremely high.

2.1.10 Staff development programmes

There is very little evidence as to the existence of staff development programmes at any of the public universities. There are efforts in this direction mentioned at UCA and UPOLI both for the improvement of their professors' pedagogical training as well as for the improvement of other skills like computer skills, for example and activities which are more related to current issues (globalisation and social change, for example) and specifically related to the subject matter they teach. Some other institutions (UNAN-León, for example) have plans to strengthen this area.

It is to be noted that SAREC supported research programmes have a strong component of staff development: actually, the researchers themselves participate in postgraduate programmes at the masters and doctoral levels.

2.2. Main implications of the situation of academic personnel

- 2.2.1 The whole area of academic personnel in the public universities needs more analysis and certainly a reform process. This is a very delicate matter since it has to do with labour contracts and salaries, but the present situation does not allow the universities to really operate as teaching, learning and research communities if the full time professors are only expected to be in the institution during their direct teaching hours. What time is there left for development of the institution?
- 2.2.2 It would be good to revise the salary structure, but being the situation what it is, this would have to be associated with the working hours dedicated to the institution (such as UCA considered in its reform) and the actual time spent by the professors in the universities. However, this is associated with two important problems: a) budget and b) space. With respect to this last point, it was mentioned at some institutions that they did not have enough space for the professors to be there all the time.
- 2.2.3 The fact that most professors in Nicaraguan universities have tenure has both negative and positive implications. If the professors are young and they have postgraduate degrees, there are good possibilities for continuous development and growth. If they are middle age or older and do not have postgraduate degrees, it might have more negative implications. However, this points to the fact that one aspect that is badly needed is to have information systems and specific indicators for decision making on academic personnel at the different universities. This information should be taken into consideration when planning postgraduate formation programs and staff development programs.
- 2.2.4 Discrepancies in personnel statistics between the institutions and the CNU show that there needs to be more co-ordination and establishment of criteria as to the meaning of the different variables considered.
- 2.2.5 Information with respect to the academic level of the professors in the Nicaraguan universities and with respect to the number of professors that are currently involved in postgraduate programmes should be analysed closely both at the institutional and national levels in order to make decisions regarding programmes that are strong which could serve not only institutional but national needs and programmes that are weak and need strengthening. Decisions on the basis of this information could be made with respect to initiation or strengthening of new postgraduate programmes (masters degrees). The universities seem to start these programmes with little planning and consideration of the national demand: demands from society and demands in terms of the possibilities of offering good, strong programmes on the part of the universities.

- 2.2.6 It would be very useful to have very specific information on academic degrees and area of specialisation of the professors at the national level (CNU, for example) as a resource bank to be consulted when establishing a postgraduate programme in any of the universities. Some kind of staff sharing programme could be devised in order to concentrate the best resources as staff of the postgraduate programmes.
- 2.2.7 There is a need for an incentive system linked to academic performance and merits. It would probably be a way to retain the professors at the university rather than having them look for work in other institutions.
- 2.2.8 The lack of academic work load controls and evaluations systems for professors, reaffirms the fact that there is a need to develop the whole area of management of academic personnel in the universities including information and evaluation systems, academic career and incentive systems as well as regulations that support all of this.
- 2.2.9 Evaluation of the proportion of non-teaching or administrative personnel with respect to the full time or total number of professors at each one of the universities in order to formulate a specific plan for “trimming” the bureaucracy.
- 2.2.10 Staff development programmes are indispensable in Nicaraguan universities, especially considering the academic level of the majority of the professors as well as the fact that they remain in the organisation for many years.

3. BUILDING INSTITUTIONAL CAPACITY FO RESEARCH IN SELECTED NICARAGUAN UNIVERSITIES

3.1. Research in Nicaraguan universities

The situation for research in the main Nicaraguan universities is more complex than the situation for the academic personnel. Research requires academically sound personnel that has had training and experience in research as such; it requires a tradition of research in the institution; it generally requires of teams of researchers rather than an individual researcher; it requires - especially in some areas - of an adequate budget; it requires time especially dedicated to research; it sometimes requires special facilities; it requires of adequate support structures and incentives. Not every professor can be a researcher and it is usually the case that when there are personnel needs, teaching needs are generally considered more urgent than are research needs.

In Nicaraguan institutions the conditions required for research are not easily available. Budgetary conditions and the situation of academic personnel described in the previous section speak clearly to the fact that there are serious institutional constraints.

Despite this, it is evident, from the information we have received that despite this, there are serious efforts being made which should be commended. The following sections will analyse some of these conditions and efforts.

Research should be developed in higher education institutions not only for its own purposes but also to contribute to teaching programmes, especially at the postgraduate level. It is difficult to conceive of starting masters and doctoral degree programmes if they are not linked to research programmes.

The following aspects reflect a review of the situation in this area:

3.1.1 Strategies, policies and priorities

Most of the universities have not defined research strategies or policies. What is being done in research usually stems from individual initiatives presented at the departmental level, approved by the dean and presented to the higher authorities in order to obtain financing. Initiatives also stem from Research Institutes and Centres where they exist. However, in the case of UNAN-Managua, for example, most of these research institutes and centres operate with both administrative and academic autonomy from the University.

In the cases of UPOLI, UCA, UNI and UNA there are statements which reveal some effort at defining aspects such as strategies, policies or priorities. However, these are very diverse and disperse in nature: some aspects of them are very general and express, for example, the importance of research in generating new knowledge and some are very operational and stress the need for inter-institutional co-ordination or the search for funds. They represent, however, a significant effort and by their very existence indicate those institutions are conscious of the importance of defining policies in this area.

UCA has defined its strategy as one of giving “priority to applied research for the promotion of human development in the country, understood as holistic development which comprises economic, technological, civic, cultural, psycho-social and ecological aspects of human life”. UNA, in turn, has defined its priority as socio-economic and covering the three research axis they have defined: socio-economic as such, technological and social. There is no explicit definition for UNI and UNAN, possibly because it is understood that they have specific areas to cover according to their mandates as institutions.

In the case of the other institutions: UNAN-Managua and UNAN-León, there is a recognition that there are no general strategies, policies or priorities defined at the institutional level. Professors from each department, faculty, centre or institute define, individually in some cases and collectively in others, what their research orientation will be.

However, in the case of UNAN-León, there is an indication that, although there are no priorities, research concentrates mainly in two areas: infectious diseases and the management of natural resources in addition to the research work being done in the area of public health.

3.1.2 Structures to support research

At the present time, UCA, UPOLI and UNA have institutional structures operating in order to support research. UCA has three specialised structures: a) Vicerrectoría de Investigación y Postgrado, b) Dirección de Investigación in the Vicerrectoría Académica and c) Research Institutes and Centres. UPOLI has: a) a Departamento de Investigación y Postgrado and b) a Comisión Asesora de Investigación and UNA has: a) Dirección de Investigación, Extensión y Posgrado (Programa de Investigación), b) Consejo de Investigación y Extensión Universitaria and c) Consejos de Investigación y Desarrollo. There is also the Programme to Support the Research Council at UNA which administers the funds and is responsible for follow-up and evaluation. UNI has the intention of creating a Vicerrectoría de Investigación y Desarrollo and appointing a scientific council.

UNAN-Managua and UNAN-León do not have specific institutional structures to support research. UNAN-Managua relies on the Departments and Faculties and on the administratively autonomous research centres, each structure working on its own with no institutional co-ordination. UNAN- León relies upon and operates through the teaching Departments where each one of the different research projects belongs. UNAN-León is intending to establish a Scientific Council during the first semester of 1998.

Other research structures are the research centres and institutes. Not all the universities have centres and institutes. For example, UNAN-León and UNA carry out research projects based on the departments and faculties. UCA, UNI, UNAN-Managua and UPOLI do have research centres and institutes. For a list of the research centres and institutes see Appendix 5.

3.1.3 Procedures for the approval of a research project

Procedures for the approval of a research project are not important per se. They are important to the extent that procedures are designed and implemented in order to guarantee the best quality of the projects, fulfilling criteria for scientifically and methodologically acceptable research project.

Current procedures in all Nicaraguan universities are quite simple. A professor designs a project, he/she presents the project to the head of the Department who in turn sends it to the Dean for approval. If the project is approved by the Dean, the project is then sent to the central structure in charge of searching for funding. In the cases where there are Research Centres and Institutes, the professor presents the project for the approval of the head of the Research Centre or Institute.

At UNA, procedures are established for the presentation and evaluation of research projects at the institutional level with the participation of the three structures mentioned in the previous section. In addition to this, there is a

proposal for scientific committees to be created. Guidelines for the presentation of proposals and a matrix for their evaluation were developed as well as methodological recommendations for the formulation of lines of research.

With respect to procedures, the information available is not enough to be able to ascertain whether established procedures help improve the quality of research projects through the formulation, evaluation and approval of proposals and their execution. Procedures may be well established on paper but not work in practice; on the other hand, much depends on the persons involved in the process of the formulation, evaluation and approval of the proposals and there is no information available on this.

3.1.4 Evaluation of research projects

Most of the institutions state that they do not have established procedures for the evaluation of research projects. It is mentioned that this process takes place in the departments or centres/institutes that carry out the projects. However, institutionally, there is no evaluation of research projects. Some of the institutions that have externally funded projects mention that the only evaluation that takes place is the evaluation required and done by the donating agency.

3.1.5 Financial aspects with respect to the development of research in the Universities

UNAN-Managua indicates that 9% of its university budget (US\$ 622.600.00) is dedicated to research. UCA states that it assigns approximately US\$ 150.000.00 out of the budget the university receives from the State to research. UPOLI states it assigns approximately US\$ 26.350.00 for salaries of personnel that work in research and about US\$ 3.000.00 for operational expenses. UCA has externally funded projects whereas UPOLI states that all their projects are self-financed.¹⁷

UNA and UNAN-León indicate that they do not officially have funds for research included in their budgets, however, it is a fact that the salaries of most of the personnel working on research projects is covered by the university budget. However, all state that it would not be possible to work on research were it not for the external funds that support these projects. They also indicate that the projects are not self-sustaining and if the funding were not renewed, the projects would not be able to survive. UCA, UNAN-Managua, UNAN-León, UNI and UNA depend upon external funds in order to carry out the research projects that are currently being developed. A list of the research projects can be consulted in Appendix 6.

¹⁷ Information for 1996 given by the universities.

The situation is as follows:

- 1) UCA reports having 26 research projects at the moment. Most have external financing with the exception of one that generates funds through consultant services, three that are associated with scholarships and two are financed with UCA funds. The rest of the projects have external financing coming from different sources such as: Belgian universities, Ford Foundation, Radda Barnan, SAREC, Japan, Swedish Church and FNUAP-Nicaragua. The amount of external funds reported is US\$ 433.400.00.
- 2) UNI reports having 52 research projects at the moment. It indicates that the following projects have external financing: Project from PIDMA (Udelft-Holland), Biomasa de Sucher and Holtzer (Austria), Projects from the Faculty of Chemistry (SAREC) and Projects from the Faculty of Electrotecnia. The amount of external funds reported is US\$ 759.000.
- 3) UNAN-Managua reports having 43 research projects at the moment. Projects receiving external financing are: CIGEO (US\$ 99.187), CIRA (US\$ 298.031), CIES (US\$ 195.412), Faculty of Medicine (US\$ 195.412), IPS (US\$ 24.043 and ESECA (US\$ 67.287). This amounts to a total of US\$ 765.580.00 coming from external sources of funding for research. It does not indicate the sources of funding.
- 4) UNA reports having 22 research projects at the moment. All the projects are financed through external funds totalling an amount of US\$ 1.250.073.31. The funding agencies are: SIDA, SAREC, Pasolac (Switzerland), Italy, EM Technologies, Inc., International Plan Genetic Resources Institute (IPGRI), ADESO (Holland), PROMAP-MARENA (funds from the World Bank), IAEA/FAO (Viena), Universidad Autónoma de Barcelona, Centro Internacional CROCERVIA (Italy), IFS (International Foundation for Science), FAO (Norway), NUFFIC (Holland), COSUDE (Switzerland), European Community, Kellogg Foundation, UNA Research Council.
- 5) UNAN-León reports having 33 research projects at the moment and reports external funds for those projects for a total of US\$ 1.395.966.08. It seems as though some of these projects might have more than one year duration since it also indicates that for 1997, it is receiving an approximate amount of US\$ 400.000 from external sources for research. Sources of funding are not indicated with the exception of SAREC and OPS/OMS.

3.1.6 International exposure: international meetings and publications

All of the universities indicate their researchers attend international meetings and have their research published. Many of the international meetings mentioned are of a regional nature (Central American) and the journals mentioned are mostly national journals published by the universities. In very few specific cases, there is international projection and this is directly related to the SAREC projects where both these aspects are a requisite.

3.1.7 Researchers

There are little or no incentives for researchers. In some cases, when projects are financed with external funds and it is included in the project budget, the researchers might receive some economic incentives (complementary monthly salaries). Incentives which are also associated with the projects is the possibility of scholarships and participation in international conferences and symposia. Finally, another incentive mentioned is the autonomy the researchers enjoy.

All the universities mention that what is generally done is to reduce the teaching load of the professor who wants to do research and does not belong to a research centre or institute but is part of a department. In the case of research centres and institutes, some of the researchers associated to them dedicate full time to research.

Since the universities did not provide specific information on this or the academic load of professors, it was not possible to determine the percentage of professors and/or time involved in research in each department/faculty or centre/institute.

Another important aspect is the level of academic formation of the researchers. Most institutions did not report on this matter or their information was very vague.

3.1.8 Infrastructure

Library facilities are not very appropriate in Nicaraguan universities, especially from the point of view of research. There has been a very big effort in supporting this area, especially the automation of the libraries and access to Internet. All the participating institutions recognise that there has been progress in this area. Library resources continue to be one of the priorities of all institutions at the present time.

There is a general lack of bibliography and journals. In some cases the research projects have been able to acquire bibliography associated with their project. This bibliography is usually kept in the offices of the project or of the participating professors. It is understood that this bibliography be kept by the projects themselves, but at the same time, some way may be found to put this bibliography at the service of the rest of the university community.

It was observed, in some of the universities that the number of volumes reported refers not so much to a variety of titles but includes 5 to 10 copies of the same title. This is so because students do not have the necessary resources for buying the books and course books have to be consulted in the library. This means, in many cases, that rather than acquiring a variety of books, the university opts for a number of copies of the same book so that it can be made available to the students in the courses.

Information provided by the different universities is as follows:

- 1) UCA reports having 135.000 volumes in the different libraries and 65 computers in the different departments as well as access to Internet at the departmental level.
- 2) UNAN-Managua reports having no specific infrastructure for research other than regular university facilities and modest documentation centres, basic computer equipment and bibliography acquired directly by the projects. No information is given at the university level.
- 3) UNA indicates it has laboratories in certain areas, transportation, computer equipment and bibliographic information. UNA houses the National Information and Documentation Centre on Agricultural and Livestock Matters (CENIDA) which is undergoing a modernisation process: acquisition of books and journals has been reinitiated.
- 4) UNAN-León indicates that this year, the process for the automation of the libraries of the university was completed. This permits access to the catalogues of all the libraries and summaries of journals that the library receives. An Internet node was installed and it is available to all researchers. At the present time they are working on the installation of a local network that will link all the buildings of the university with the Internet server and the data bases of the library. All the research groups and the researchers will have direct access to Internet. All the projects have informatics resources and, in general, they have basic bibliography related to the topics of research. At the present time, the library receives close to 500 periodic publications, the majority of which are in the thematic areas of the current research projects.
- 5) UNI reports having between 400 to 600 titles associated with some of the research projects.
- 6) UPOLI: No information available.

3.1.9 The research projects in an institutional context

Specific information was requested as to the impact of research projects inside the institution taking into consideration pre-graduate programmes, seminars offered to other professors and courses or seminars for students. The universities state that it is difficult to determine the impact of the research projects inside the universities and that, in general, researchers do offer, in many cases, seminars for other professors and courses for students. This is an aspect which is important in terms of institutional capacity building and could therefore be stressed or required in the externally financed projects.

With respect to the externally financed projects, some negative and positive opinions were given by the people interviewed. Among the negative opinions are the following:

- 1) Projects are sometimes quite isolated from the rest of the institution, work by their own rules and regulations and in some cases, do not integrate well within the university. They have resources to carry out research, work according to their own timetables, with the agreement of their foreign partners or tutors (in some cases imposed by them), disrupting at times, the programming and timetables of the departments, thus affecting the stability of the departments.
- 2) Two other negative factors associated with the externally funded projects which involve the formation of masters and doctoral candidates:
 - a) There are no clear rules for the selection of the candidates on the part of the departments thus apparently not guaranteeing equal treatment for all candidates.
 - b) It usually takes between 5 and 6 years in order to finish a programme for a masters or doctoral degree. This is considered by some to be a very long time for a person to be on scholarship.

Positive factors associated with the research projects in their institutional relation were:

- 1) The production of scientific articles has been improved.
- 2) The quality of the scientific content included in what is taught to students has improved.
- 3) The fact that the masters and doctoral candidates have to be tutors themselves, act as professors in the universities, has contributed to a change in the quality of methodological designs of research projects in general.

The following were concerns and needs expressed in relation to the research projects vis-à-vis their institutional context:

- 1) Concern was expressed with respect to the sustainability of the projects. In the opinion of the people interviewed, there should be some mechanism whereby the projects can be institutionalised, independently of the source of financing.
- 2) From an institutional point of view, the need was expressed for help with respect to the scientific foundation and management aspects of the research projects: institutions need help - at the institutional level - with respect to the formulation of research proposals and their management which includes both scientific and administrative aspects: search for funds, follow-up and evaluation of the proposals and of the research projects.
- 3) The need was also expressed for the university to have a more direct control in the financial management of the projects.
- 4) The need for more bibliography made available to the university community.
- 5) The definition of general criteria for the selection of masters degree and doctoral students.

3.1.10 Postgraduate programmes

Research should be the basis for postgraduate programmes although this is not always the case. UCA was the only university that reported that most postgraduate programmes had been born out of the initiative of the teams of researchers from the centres and institutes.

Information was provided by the institutions on the post-graduate programmes¹⁸ does not make it possible to determine the logic that has led to their creation or to the plans to create new ones. A more in-depth study should be done in order to identify the academic criteria behind these programmes, the academic level and origin of the professors and their relationship to research. It would also be necessary to identify which of these postgraduate programmes are offered by the Nicaraguan universities and which are offered either with the help of foreign universities or by the foreign universities themselves. If they receive help from foreign universities, it would also be interesting to identify the operational arrangements, i.e. financial arrangements, foreign visiting professors for intensive periods of time in Nicaragua and others.

¹⁸ For a list of postgraduate programmes offered by Nicaraguan universities at the present time and plans to establish new postgraduate programmes, see Appendix 7.

There are plans to offer quite a number of new postgraduate programmes in the future¹⁹. The definition of strong academic criteria would be necessary if postgraduate programmes are to be solid professionally and academically.

It is interesting to observe that, at the postgraduate level, there is a tendency of the institutions to specialise in certain areas. It would have to be analysed whether these areas coincide with the research programmes or projects being developed and what their relationship is to the areas in which professors are acquiring new postgraduate degrees.

3.1.11 National level support for research

There do not seem to be any structures that support research at the national level. Decree 5-95 creates the Nicaraguan Council of Science and Technology. It has, however, never been implemented. It was to be composed of 6 representatives from the government (Ministries of Economy and Development, Agriculture and Livestock, Environment and Natural Resources, Education, External Co-operation, and the Nicaraguan Institute for Agricultural Technology; 3 representatives from the academic sector: 2 rectors and one representative of the National Institute of Technology, and 3 representatives from the productive sector (industrial associations, scientific-technical professional associations, agricultural associations).

In view of the fact the CNU is now proposing the creation of such a council, it should be analysed whether such a structure would have a positive effect or not for research.

3.2. Main implications of the situation of research

- 3.2.1 If the objective is to build institutional capacity for research, there is a need to define more precisely what this means in the case of the Nicaraguan universities, taking into consideration the specific situation of each institution and of all of them as a group. A plan should be formulated in order that the efforts to support this objective can be geared, both by the institutions and by the co-operating agencies towards the implementation of this plan.
- 3.2.2 Evaluation procedures should be defined. The best researchers should be involved in evaluation processes, in order to guarantee the quality of research proposals and the execution and follow-up of the research projects until their conclusion. This should be a factor not only associated with the requirements of external funding agencies but should be part of general institutional procedures.
- 3.2.3 Research efforts at some of the universities seem to be disperse, probably because of the lack of clear and adequate strategies, policies, priorities or lines of research. It is necessary to analyse the priorities taking into consideration national and institutional criteria so that institutions avoid formulating research projects according to the funds that are available. In some other cases, although

¹⁹ See Appendix 7.

there are no lines of research defined, research projects have concentrated in certain areas. This is one of the issues that should probably be analysed not only from an institutional point of view but from an inter-institutional point of view, i.e. which institution is concentrating on what kind of research and should the effort be to strengthen research in a certain area in one of the institutions and support the strengthening of other areas in other institutions.

- 3.2.4 The high degree of dependence of research projects on external funding is certainly a situation to be analysed carefully. Most universities do not carry out research projects if they do not have external funding. External funding plays a very important role as complementary funding. Almost total dependence can, however be dangerous. Diversification of funding and income generation through research projects should be explored.
- 3.2.5 Structures that can support and guarantee good research do not exist institutionally or nationally, i.e. research councils or committees, vicerrectorías de investigación. It might be helpful to establish research councils or committees in each one of the universities - non-bureaucratic - that can guarantee the orientation and evaluation of research proposals, their implementation and evaluation.
- 3.2.6 An academic career which includes academic and merit based incentives for researchers should probably be developed.
- 3.2.7 Adequate co-ordination between research projects and postgraduate programmes should be sought. Postgraduate programmes should be, ideally, research based. It might be good to establish general - national (CNU level) - guidelines for the establishment of new postgraduate programmes and an evaluation programme of current programmes.
- 3.2.8 Research attitudes and practices should be developed early in a student's career. It would help lower the number of "egresados" and at the same time, young researchers could be detected and be incorporated as young members of the established research programmes. Curriculum reform both at the graduate and postgraduate levels should be oriented along these lines.
- 3.2.9 Attention should be given to the situation of libraries from the point of view of content (other aspects of the project are concerned with their automation). The report given by the universities and the short visit to some of the libraries indicate there is a lack of bibliographical material for researchers to work with. Priorities should be defined in terms of the differentiated needs of pre-graduate programs, post-graduate programs and research programs.

4. RELATIONS BETWEEN UNIVERSITIES AND THE PRODUCTIVE SECTOR

4.1. The relations between universities and the productive sector

The future of higher education institutions lies in the possibility these institutions have of serving society. This has always been one of their main objectives. At present this objective is intimately related to:

- 1) the possibility higher education institutions have of being able to produce the qualified personnel the society needs. This relates both to employment and producing entrepreneurs
- 2) the possibility higher education institutions have of producing, through research, knowledge that is needed by the society and being able to transfer it to society in a useable way
- 3) the possibility higher education institutions have of directly serving the needs of the productive sector by providing services that can in turn be compensated for economically so that the universities can generate funds to finance their own development.

Traditionally, in Latin American countries, there has been a divorce between higher education institutions, especially public institutions, and the private sector. Higher education institutions have been financed by the state and therefore have seen no need to generate their own funds and, on the other hand, the private sector has perceived the universities as sources of conflict and as institutions dealing with knowledge at a non-applicable level.

There has been a tendency - especially in higher education institutions in developed countries - to work hand in hand with the productive sector, to sell services that are useful to the productive sector and thus generate funds for their own operation and development and to establish mechanisms for technology transfer to society.

Latin American institutions have been moving in this direction also. It is important to analyse, in the case of the most important Nicaraguan universities, what is the situation is with respect to these issues.

The issues we have identified before are closely linked, not only with the fulfilment of the mission of the institution in the late XX Century, but specifically with answering specific questions such as:

- 1) Are the universities preparing academically qualified personnel that meets the national needs of development?
- 2) Are the universities producing important research linked to the solution of the social, economic, political, scientific and technological development of the country?

- 3) Are the universities making an effort to find out what the needs of the productive sector are and developing ways of serving those needs?
- 4) Are the universities making an effort to transfer knowledge and technology to relevant sectors of the society?
- 5) Internally, are the universities developing mechanisms in order to facilitate the pertinent and close relationship that should exist between the programmes they offer and develop and the productive sector?

The relationship between Nicaraguan universities and the productive sector will be analysed in three different aspects:

- 1) Careers with the largest number of students in the selected Nicaraguan universities
- 2) Research or extension programmes or projects that directly relate to the productive sector
- 3) Income generation for the universities through the sale of services to the productive sector

4.1.1 Careers with the highest enrolment

With respect to the careers with the highest enrolment in the Nicaraguan universities²⁰, the following is observed:

1. UCA: The Faculties of Administration, Juridical Sciences and Humanities have 83.23% (4001 students) of the total number of students (4807) enrolled at UCA, the highest number (1829) enrolled in careers belonging to the Faculty of Administration.
- 2) UNI: This university's total enrolment is 5.662 and all the careers offered are technical careers. Students are very evenly distributed among the different careers and areas, the highest being, the area of Electronics and Computer Science, followed by the areas of Construction Technology (agricultural and civil engineering) and Industrial Technology (industrial and mechanical engineering).
- 3) UNAN-Managua: has the largest student population: 13,687. The careers with the greatest number of students (4341) are Medicine, Economy, Business Administration, and Computer Science. Business Administration also has the largest number of students amongst the technical careers (657).

²⁰ Statistical information for 1994 included in "Información Estadística de la Educación Superior de Nicaragua 1985-1994". Consejo Nacional de Universidades, República de Nicaragua.

- 4) UPOLI: This university has a total enrolment of 1,577. Most of its students are enrolled in technical careers. Careers with the highest enrolment are Bank and Finances (317) and Marketing (252). Pre-graduate career with the highest number of students (109) is Bank and Finances.
- 5) UNA: has a total enrolment of 2,268 and only offers careers related to agriculture. The career with the highest number of students is agronomic engineering (1979).
- 6) UNAN-León: is the second largest institution with a total of 5,222 students. The careers with the highest enrolments are: Law (1250), Medicine (1243), Pharmacy (372) and Biology (206). However, Law and Medicine have 48% of the total number of students.

Students' choice of careers does not depend so much on the opportunities offered by the university but on other factors: status of the career (law and medicine for example), secondary school preparation (difficulty of careers in the technological and basic science areas), careers that students believe have a high demand (business administration), although with respect to last this career, it is a fact that many of its students are already working. It is interesting to note, however, that UNI, which offers mainly engineering careers has high enrolments. Out of the total of 33,223 students enrolled in Nicaraguan universities in 1994, 24% are enrolled in UNI and UNA. . There is no study on the labour destination of the students graduating from higher education institutions.

The possibility for the universities to respond to the needs of society or the productive sector is complicated since there are no clear societal development plans or studies as to what are specific needs of the productive sector. Universities have therefore developed their career offerings based on their own internal development, resources available nationally and international co-operation that seems to be a factor which has supported the development of postgraduate programmes.

4.1.2 Research or extension programmes related to the productive sector

With respect to research or extension programmes or projects that directly relate to the productive sector there are interesting efforts being made by the Nicaraguan universities.

At UCA, Nitlapán-UCA does not only relate to the productive sector, it works with the productive sector promoting the re-organisation of rural co-operation; it is a relation between partners. There is also a Programme for Rural Financing which benefits around 4,000 rural families with a portfolio of 3 million dollars. There is an Arborization-reforestation programme which benefits 500 families, through which one million trees have been planted in the dry zone of Masaya. At the present time, there are plans for intensifying the relationship with the productive sector by:

- expanding the financing programme: expand its portfolio, beneficiaries and territories
- expanding the reforestation programme not only to a greater number of beneficiaries and to other zones of the country but in its content in order to multiply a programme which combines trees and livestock.

UNAN-Managua indicates that the following projects have a direct relationship to the productive sector:

- 1) Faculty of Medical Sciences has projects that relate to the formation of human resources at the national level
- 2) Faculty of Sciences develops projects on Dosimetría de Radiación, Calibración de Equipos de Rayos X and with other radioactive sources, calibración de pesas y balanzas, etc.
- 3) Center of Geophysics Research develops projects on Sismology and Volcanic Danger with INETER (Instituto Nicaragüense de Estudios Territoriales) and with Alcaldía de Estelí searching for subterranean waters for the city.
- 4) Centro de Investigaciones y Estudios de la Salud: projects to train personnel from the Ministry of Health for the management of health services and advise specialists of that institution in the development of their own research projects.
- 5) Centro para Investigación en los Recursos Acuáticos: Linked to projects with state institutions, international scientific organisations and national enterprises.

Within its future plans, the institution is aiming at the goal that each academic unit organise and co-ordinate its activity with a more entrepreneurial vision.

UPOLI indicates that the work of the following institutes has a socio-economic orientation and is directly related to the productive sector:

- 1) Instituto de Capacitación e Investigación en Desarrollo Rural Integrado (ICIDRI): founded in 1995 to develop projects and activities of training, research and extension in topics related to integrated rural development, emphasising on appropriate technologies. At the present time it is planning to offer a Masters Degree in Integrated Rural Development, at the Central American level.
- 2) Institute of Humanistic Development (IDEHU): founded in 1996 to improve the quality of life of Nicaraguans, to offer the opportunity to persons, institutions, organisations and churches at the national and international level to study at the training level and at the postgraduate level in areas such as: education, Latin American studies, family advice, theology and culture, justice, peace and the integrity of creation.
- 3) The Distance Education Programme offered by the university.

- 4) The work done by the university's regional centers to serve specific geographical areas: Centro de Boaco, Rivas y Estelí

UNA indicates that its main external relationship is with the Nicaraguan Institute of Agricultural Technology (government) with which it has been also involved in the training of its technical personnel. It states to have no specific projects related to the productive sector. However, an analysis of the research projects indicates most of them are directly related to the needs of the productive sector and are developed in selected geographical areas. There is a special interest in developing a closer relationship with the productive sector in order to strengthen the formation process of students and ensure a constant renewal of professors with respect to the real needs of the productive sector in reference to research and technologies.

At UNAN-León, the relations with the productive sector have been established in specific areas, are very focused and have emerged out of personal contacts. Important relationships have also been established with the public sector, especially Ministry of Agriculture and Livestock, MEDEPESCA of the Ministry of Economy and others. With the private sector there are very few contracts or agreements. Recently, the National Assembly approved the creation of Foundation "Alma Mater", as a juridical entity which has as one of its objectives to serve as a link between the university and the productive sector.

The following specific projects have an important relationship with the productive sector:

- 1) In the area of agriculture: application of technological packages for the control of plagues using biological agents.
- 2) Reproduction of musaceous using the cultivation of tissues from imported varieties which are resistant to plagues and have a good productive outcome; work is being done with small producers in this area.
- 3) Agro-ecological management of alternative crop in plantations belonging to small and medium producers for the industrialisation of seeds for obtaining combustion oil.
- 4) Agro-ecological management of shrimp farms with producers associated in co-operatives and private producers. The analysis of environmental variables, pollution factors and study of frequent pathologies is emphasised. There are other studies associated with the production of food (algae) for the shrimps (algae).
- 5) Transfer of technology and quality control in the production of nutritional cookies based on soy flour, in private bakeries at the national level. These bakeries supply schools attended daily by 250.000 children from pre-school and the first two years of primary school, nine months per year. The formula for the flour is established, the quality of the product is technically supervised as well as the quality of the production process. (Agreement between UNAN-León/MED/PMA).

Through the Foundation “Alma Mater” whose board of directors and members are, in a majority, representatives of the productive sector, it is hoped that a better relationship will be established in order to work together in the development of common projects. At the present time all projects of new university programmes are discussed in committees in which there are representatives of the productive sector. Shortly, there are plans to initiate a project for the creation of enterprise incubators in which work could be done together with productive sectors. Finally, the university is promoting the discussion on the topic of normalisation, metrology and quality control with the objective of becoming a centre of reference and training for the Occidental Region.

4.1.3 Income generating activities

With respect to income generation for the universities through the sale of services to the productive sector, where it does exist, the situation is deregulated. It seems as though it has been the initiative of specific persons or groups within the universities; not part of an institutional plan, with the exception of UPOLI.

At UCA, in addition to its Development Programme, Nitlapán-UCA has a Research Programme. Through this programme, services are sold as consultant services to international agencies and to the government. There is also consultant and advisory work being done for popular organisations and commercialisation enterprises that are administered by rural families. The consultant work for agencies and the government generate income for the institute; not so the programme for rural families which has scarce resources. The amount per year is variable: it can be between US\$3.000 and US\$1.500.

Regulations with respect to the “sale of services”: Nitlapán-UCA has administrative autonomy with respect to UCA. The only regulations relate to the content of the consultant work done which should be in accordance with the agenda of the institute and the objective that there be real possibilities of influencing and promoting the development of the country.

UNI indicates having established relations with the productive sector with respect to: transfer of heat and services through its professors in the different laboratories, units of production, research projects. Also included is advice, repair and maintenance of equipment, Internet services and networks, course project and production practice by the students.

Services are also made available in the areas of technological evaluations, project analysis, improvement of products and packing materials, production studies, studies of environmental impact, technical assistance to melters, participation in the solution of problems of small and medium size enterprises through teachers and student monographs, is involved in the solution of technical problems of enterprises, training of personnel for the enterprises upon demand, repair and maintenance of equipment, Internet services and networks, training courses and seminars and semi-distance careers.

Plans for the future at UNI include visits to all the enterprises that relate to the areas in which the university works to inform them of the profile of each one of the careers offered by the University, the personnel working in each career, installed capacity and sale of services.

With respect to the sale of services, there are plans to create foundations and university enterprises. The university has sale-of-services programmes in 3 of the 6 faculties. The amount obtained varies from one faculty to another and from month to month. It is mentioned that the university has regulations for the sale of services and some faculties have their own regulations based upon the regulations of the university, however these documents were not made available.

It seems that UNI is the institution that has been working more intensely in the sale of services and is successful in this area. However, people at the university are reticent to give information about the income this generates and how this income is distributed. From the interviews held, it seems as though this has become very much of an individual or group enterprise rather than an institutional venture. It seems as though the fact that there are no regulations - only those agreed upon by the interested individuals - means that the benefits of the sale of services are almost exclusively for individuals and not for the institution.

At UNAN-Managua it is known that, especially the semi-autonomous research institutes are actively involved in the sale of services, however, no specific information is available, except for the continuous education activities of CIES. It is indicated that UNAN-Managua plans to develop greater links with the productive sector. It has been thought that a structure linked to the Rector's office can promote and develop this important sector of institutional work. At the present time there are no regulations with respect to the sale of services: each faculty, department or centre or institute applies their own specific criteria for the execution of these tasks. It seems as though there is a situation in this institution also, similar to the one at UNI.

UPOLI states that both the Distance Education Programme as well as the Institute of Computer Science contribute to the generation of financial resources to cover up to 50% of the resources needed to complete the required university budget to complement the resources received from the state. The continuing education programme from 1995 to August 1997 served 768 participants, 52% of which were personnel of UPOLI. These courses have generated resources that have made it possible to subsidise the participation of the personnel of UPOLI and acquire equipment and didactic material for continuing education programmes in general. Recently, a Co-operation Agreement was signed between the National Programme to Support Small Enterprises (PAMIC) and UPOLI. The schools of Design, Administration, Commerce and Finances will be involved in the execution of this agreement.

UNA indicates that, as an institution, it does not officially have any sale-of-services projects. However, it seems as though professors and academic units from UNA are involved in these activities. UNA states that there are no general norms officially approved which respect to the sale of services: the head of each

unit comes to an agreement with the professor on the terms in which the sale of a service will take place. It is mentioned that the professor receives between 40 - 50% of the total amount paid for a service; the rest of the money is kept by the academic unit. There is no estimate on the amount of income generated; all the academic units are involved in the sale of services.

UNAN-León indicates that there are several initiatives with respect to the sale of services, although few are pursued as a systematic activity. At the present time, the organisation for the sale of services is being discussed with the purpose of avoiding that sale of services negatively influences research activities or consumes resources that should be destined to teaching. The objective is to achieve an adequate balance of all these activities so that quality services can be rendered, maintaining the dynamism of research and the quality of teaching. It is considered that this activity can be a source of additional income for those who participate in it and for the University but that it should not become the main activity. There are regulations, but they are being revised at the present time.

4.2. Main implications of the situation with respect to the relations between universities and the productive sector

- 4.2.1 There is no information available with respect to key issues relating the needs or demands of the Nicaraguan society for certain types of professionals, the labour destination of university graduates in Nicaragua or new areas where development is required. Since information on these key issues is important for university development in order to better serve the needs and demands of society, it may be very good for those universities that are doing research in the socio-economic field to initiate research projects that could make this kind of information available. This would be of great service to the society as a whole and the university system in particular.
- 4.2.2 In terms of giving secondary school students information and orientation on the many different opportunities available in Nicaraguan universities it might be interesting to develop and make available to secondary school students, career information and orientation programs and activities together with secondary school principals and teachers. Adequate co-ordination and support from university professors could also be made available for secondary schools in those academic areas in which students are perceived not to be adequately prepared in order to prevent the establishment of remedial courses at the university level.
- 4.2.3 There are interesting experiences taking place both as research and extension programmes in the different Nicaraguan universities which are closely linked to productive sector needs or activities. It would be interesting to share experiences (at CNU level for example) and to systematise these experiences and make information available through different media. Information on specific successful experiences being developed by Nicaraguan universities can be a way of informing society how universities are returning significant services to society and it is worth investing in them. This information could also help create

greater trust in university capacity in certain areas and might help bring universities closer to enterprises which might need of their services.

4.2.4 Sale of services on the part of Nicaraguan universities is at a starting level. It is a good moment to analyse the issue carefully, from an institutional point of view in order to establish adequate regulations that stimulate the sale of services from an institutional point of view, grants adequate incentives to professors that embark in the sale of services and establishes adequate protection and co-ordination with regular academic activities of the institutions. If this is done when activities are starting, it is possible to consider adequately, the both the interests of the institution and the interests of individual professors or groups of professors before the interests of professors become more important than the interests of the institutions. Adequately regulated, the sale of services can be of great service to society and can be very beneficial to the institution making it possible for it to add important contributions to the university budget for equipment and other aspects which are not adequately financed by the regular university budget. Regulation and university backing of these types of activities can also guarantee clients of good service. It may be interesting for Nicaraguan universities to analyze the experience of similar institutions in Latin America that have developed regulations and interesting experiences in this area.

IV. CONCLUSIONS

We believe that the following general observations on higher education in Nicaragua are the most important from a perspective of supporting future change and development:

- 1 The effectiveness and efficiency is low in the sense that graduate or undergraduate programmes and, to some extent, research is de-coupled from both from student demand and societal needs. This produces both unemployment and brain drain. Furthermore, the time needed to complete studies and the number of students of a cohort remaining the last year of a programme is such that the cost/student is too high.
- 2 The infrastructure in terms of library services, information systems and administrative systems needs to be developed and improved. There is a lack of bibliography and journals which is to the detriment of both teaching and research.
- 3 The situation of the academic personnel needs urgent attention. A more in-depth study is in order so that adequate attention can be given to the different issues: staff development programmes focused on real needs, formation programmes for new professors bearing in mind the academic programmes that need strengthening, revision of salaries and the corresponding requirements on performance, quantitatively and qualitatively. Incentives tied to performance need to be developed, simultaneously including incentives for doing research.

- 4 Research and investigation must be expanded. This aspect is closely linked to the quality of teaching personnel, which needs to be involved in or at least come in contact with research, but also to the quality of graduate and undergraduate programmes. Wherever relevant, students should be involved and trained in doing investigations. Proper institutional structures to support research need to be developed including systems for evaluation of projects.
- 5 The institutional effects of research need to be focused and emphasised. Much research seems to be isolated and driven only by specific external research foundation something which endangers both the internal usefulness and the sustainability of projects.
- 6 In order to improve financing, each university is well advised to try to develop sale-of-services programmes. This requires, however, first of all a strategy covering the areas of operations as well as a definition of the extent of operations. There has to be a balance between the time devoted to the university's main activities research and teaching and the commercial activities. Secondly, proper systems for managing the commercial activities need to be established.
- 7 Significant efforts at university reform are being made at some of the Nicaraguan universities. It is at the institutional level that actual reform efforts have specific impact. University management should be strengthened in order that adequate leadership for change is prepared to identify key issues and orient specific needed changes. A very clear distinction should be made between activities supported at the national level (CNU), requiring that they have specific incidence in the institutions and activities that should be supported at an institutional level. Both, adequately oriented, can be very beneficial for the universities and the system as a whole.

V. RECOMMENDATIONS

1. Areas in which the universities are requesting support

Universities were asked to point out, through the interviews and the questionnaire, the specific areas where support towards university reform and modernisation was required. One aspect which was outstanding was the request that support be given to reform and modernisation activities in the institutions. It was expressed that this could be combined with support for some general interest activities at the national level, but that the main focus should be institutional.

Specific requests from the universities are very diverse and disperse, going from the acquisition of computer or laboratory equipment to the formulation of strategic plans; from the acquisition of bibliography and the automation of libraries to support for specific research projects; from training of teachers in

specific areas and methodologies to training of management personnel; from curriculum development to extension projects.

Considering the conclusions of this study, the reform efforts carried out by the different institutions and the results of the CNU programme, support for modernisation and reform efforts and research in the Nicaraguan universities could be based on the identification of certain key areas which are common to the different universities involved but where implementation activities take place in the institutions themselves.

Specific recommendations for the implementation of co-operation supported activities are given in the following sections.

2. The orientation of co-operation

In our opinion the CNU programme has addressed some of the important aspects for the development of higher education in Nicaragua. Among these should be mentioned:

- a) the first step in the creation of a common culture
- b) the focus on curriculum development with self evaluation
- c) the development of a common information system
- d) the development of a model for financial control
- e) the attempts to improve library services
- f) the attempt to improve university management

For the future we believe that the basic approach to support and further the process of change should be centred on four aspects:

- 1 Support to the CNU in building an information exchange system for higher education. CNU should also be able to organise conferences, seminars and workshops of common interest for the universities especially establishing fora where the universities can exchange experiences from their respective development processes.
2. Selective support to development projects at the university level. A requirement for support should be that the university receiving support should organise a conference or a seminar to share the results of the project.
3. To improve the informational infrastructure, support should be given with the purpose of making it possible for each university to have a functional Internet connection. Continued support should be given to refining and further developing the statistical information system. This system should include not only statistics but should aim at developing key indicators for decision making both at the university and at the national level.

4. Support to research projects should be continued. Since there is a lack of regular resources for research, special research funds could be set up at each university. These funds would then be used to "buy" time for research from teaching in the same manner as the local university funds are handled in Sweden. The contribution to these funds ought to come from both each university respectively and international aid organisations. Such funds and the research sponsored requires a scientific committee at each university for the allocation and evaluation of funding.

Since it is vital that each research project is not carried out in isolation from either teaching personnel or graduate and undergraduate programmes, a requirement that e.g. disciplinary seminars should be held ought to be introduced as a requirement.

3. Specific recommendations for co-operation

There are three main areas that should be considered from the perspective of SAREC:

- a) more effective and efficient management in Nicaraguan universities
- b) critical aspects relating to the improvement of conditions in Nicaraguan universities and
- c) building institutional capacity for research.

Facing a situation where there are so many needs, it is important to ask what the priorities are and what is the most effective way of implementing a support project. Based on our conclusions, priority areas would be:

- a) strengthening university management (leadership) and management related aspects (financial management, personnel management, research management, evaluation, etc.)
- b) supporting reform activities relating to the study and attention of the urgent problems faced by academic personnel: in depth study of the situation, definition of an adequate personnel management system, staff development programs, review of salary conditions, evaluation of performance, etc.
- c) support for research activities and inclusion of conditions that support their institutional role in building institutional capacity for research.
- d) support for selected infrastructural aspects especially, the acquisition of bibliography and further modernisation of the library system and further development of the information and statistics system, complementing it with the development of indicators for decision making and planning.

3.1. With respect to management in Nicaraguan universities, the following recommendations are made:

3.1.1 Choose managers carefully. Management is fundamental in every change process. Change has to be driven by and through the management of the organisation. The choice of managers on different levels in an organisation is therefore a crucial factor. Traditionally, the academic leadership of universities all over the world, has not been oriented towards the task of managing the organisation in the sense of planning strategically, formulating goals, relating resources to goals and evaluating performance in relation to goals and strategy. The management must also devote resources to the necessary development of the organisation, e.g. the competence of its personnel, to a changing environment.

In order to accomplish this, the persons chosen for management positions must have the necessary motivation and competence required for such tasks. If the persons in management do not support such an approach to leadership, all planning and change activities will remain paper products with no real significance.

3.1.2 Give management personnel (rectors, vicerrectors, directors of key offices - for example, planning, evaluation, personnel) the opportunity to receive specific training on: leadership, planning, decision making, financial control, strategies for change and other relevant topics through specific, short, practical workshops where skills in these areas can be developed.

3.1.3 Develop key instruments for management control according to the conditions in each university. This could be done through a series of very practical workshops with the objective of working with teams from each university to develop selected instruments for decision making, i.e. systems of indicators for decisions related to the management of personnel, students and financial resources etc.

3.1.5 Train personnel in charge of international co-operation in the different universities in the formulation of projects, their execution and evaluation; information on sources of funding as well as income generation through the services to public and private sectors within the country. Through the workshop(s) organised to attain this purpose, appropriate regulations could be developed for the management of external funds within the institutions (from international co-operation and from income generation activities).

3.1.6 Develop an information system consisting of co-ordinated data bases and systems of indicators on different aspects of university management such as financial resources, student performance, teacher performance, research activities.

3.2. With respect to critical aspects relating to the improvement of conditions in Nicaraguan universities

- 3.2.1 Continue the improvement of the library system: automation, co-ordination and acquisition of bibliography.
- 3.2.2 Continue to support the development of a common information system.
- 3.2.3 Develop an automated student registration system.
- 3.2.4 Develop a strategic plan at the level of the CNU, considering the aspects included in each university's strategic plan -the development of an institutional plan to be a prerequisite- and with the purpose of co-ordinating activities and rationalising resources in those areas where this is can be recommended.
- 3.2.5 Study - in much more detail - the area of academic personnel in Nicaraguan universities with the purpose of identifying important issues related to the management of personnel that can be included in a specific strategic plan on the development of academic personnel: this could include identification of strong academic areas, of weak academic areas, plan for the postgraduate formation of personnel, plan for staff development including different aspects (both disciplinary and pedagogical training), plan for the substitution of personnel that retires, etc.
- 3.2.6 Training and support for institutional self-evaluation centred on careers and on administrative processes.
- 3.2.7 Establishment of administrative units in charge of activities between the university and the productive sector: these units could motivate, exchange information on demands and opportunities, co-ordinate activities, among other tasks.

3.3. With respect to building institutional capacity for research

- 3.3.1 Workshop with committees from the different universities to develop an "academic career" which takes into account requirements and incentives for good teachers and for good researchers.
- 3.3.2 Work towards the development of institutional "research councils" with the purpose of promoting the quality of research done in the universities through the review and approval of research proposals, ongoing and final evaluation of projects. These research councils could develop guidelines and instruments for the formulation of research proposals and for their evaluation.
- 3.3.3 Introduce research activities in the curricula of the different careers, especially postgraduate, in order to stimulate students in this area. A yearly conference could be held in order to present the best papers and some kind of incentive could be associated with it.

- 3.3.4 Develop guidelines, for externally funded research projects with respect to activities which should be held in order to have explicit impact within each institution e.g seminars, lectures, student related projects.
- 3.3.5 Identify weak and strong areas of research in each one of the universities and try to co-ordinate, at the CNU level, the possibility of specialisation of the different universities in those areas in which they are strong.
- 3.3.6 Implement the decree, which is already approved, in order to establish the Council of Science and Technology and within this council, establish specialised groups in the strong research areas. These researchers can co-ordinate efforts and yearly, a Scientific Congress could be held where papers could be presented.
- 3.3.7 Develop proposals to be presented to UNDP Nicaragua in line with their policy for financing research. In conversations held with UNDP personnel it was clear they would be willing to consider proposals from the universities to develop research studies needed in order to implement their plan.
- 3.3.8 Co-ordinate with CSUCA the revival and strengthening, at the Central American level, of research activities.
- 3.3.9 Explore the possibility, at CNU level, of editing national scientific journals with editorial councils including the best researchers in the area, rather than publications, which are not really scientific at each one of the universities.

4. The implementation of co-operation activities

- 4.1. A decision should be made with respect to which of the co-operation activities should be held and co-ordinated by CNU and which activities should take place at each one of the universities. Based on the experience of the previous project and on observations and interviews, it seems that a combination of both could have a stronger institutional impact. The support of modernisation and reform activities within the different universities could be a good incentive for change.
- 4.2. Activities should be more practical and less theoretical in nature (practical workshops or seminars rather than theoretical courses) leading to hands-on-knowledge with specific results and including, if possible, follow-up on the implementation in each institution.
- 4.3. For the development of some tasks, national personnel could be hired. This could be an incentive for specialised personnel from the different universities. For example, in matters related to information systems, specialised personnel from UNI could take charge of developing proposals, software or whatever is needed for all of the institutions rather than hiring expensive external consultants and services.

- 4.4. Co-operation and co-ordination is recommended with Central American organisations such as CSUCA which is, for example, already working on an evaluation and accreditation system for the member universities. The main public Nicaraguan universities are members of CSUCA: efforts should not be duplicated.
- 4.5. There are also specialists in other Central American countries which could be retained for some of the studies needed and the training activities planned.
- 4.6. Co-operation should be sought with other international institutions such as UNDP.
- 4.7. The subsidiarity principle could be stimulated in co-operation activities: if there are resources at the national level in order to implement these activities, priority should be given to national level resources; if there are no national level resources, the next step could be Central America and so on.

Specific modernisation and reform proposals and actions in selected Nicaraguan universities

All the universities which were selected have provided us with a description of the changes introduced during the last 4 years. In some universities some of these changes are linked to the CNU programme while others remain independent. For reasons of space, the following university-for-university presentation is condensed and does not therefore give a complete picture of all activities.

UNAN-LEON:

Changes during the last four years:

- Creation of a Committee for university reform headed by the rector with three sub-commissions for Evaluation, Mission and Implementation Strategy
- A number of workshops on university reform have been carried out, aiming at involving as many as possible and in particular persons with management responsibilities e.g. deans.
- A number of documents have been produced covering the instruments developed so far e.g. a proposal for university reform and self-evaluation instruments.
- Adaptation and implementation of the financial control system proposed by Price-Waterhouse as part of the CNU programme.
- Automation of library services and revision of journals that the university receives
- The installation of a connection to Internet

Plans for the future:

- Pilot project implementing changes proposed in the above-mentioned project
- Priority areas are:
 - pedagogical development for teachers
 - acquisition of bibliography
 - renovation of laboratory equipment
 - increased capacity for university class rooms
- Ongoing installation of a local network which connects each building to Internet

UPOLI:

Changes during the last 4 years:

- Introduction of a programme for distance education
- Establishment of regional centres for education
- Establishment of different institutes to support and promote different areas of activity (El Instituto de Capacitación e Investigación en Desarrollo Rural Integral, El Instituto de Desarrollo Humanístico, El Instituto Martin Luther King)
- Establishment of a Instituto de Ciencias de Computación to support research and investigation, curriculum development and sale of services to government and private companies
- Establishment of a Conservatorio Bautista de Música with 140 students in music
- Implementation of a automated library system
- Introduction of e-mail and Internet connection
- The development of a new Reglamento Académico with new forms of control and evaluation
- The introduction of Master programmes
- Implementation of an Entrepreneurship programme with a dual purpose of both serving societal needs and the needs of the students in finding employment

On an organisational level the following activities were carried out:

- 1 Installation of a computer network for budgeting and accounting
- 2 Physical planning in response to the increase in activities
- 3 Hiring of external consultants for internal audits
- 4 A review of the organisation has recently started

Plans for the future:

1. The construction of the above-mentioned library and a building for sports
2. Continued improvement of budgetary and other financial control systems
3. Redefine the structure of the university in terms of faculties and departments
4. Introduce new collegial decision making fora
5. Increase academic services to provide resources for the necessary investment in physical plant
6. Consolidate the distance education programme using electronic equipment for communication

UNAN-MANAGUA:

Changes during the last 4 years:

- A project for the review of the curriculum was introduced in 1994 and will be finished in 1998
- The rules that govern the academic life have been revised; instruments for evaluation have been developed; new programmes have been introduced; the number of post graduate courses have been increased; investments in computers have been made; automatic library systems have been introduced together with Internet communication facilities with other universities; the language laboratories have been modernised
- Support for research and investigation. There are 6 research centres. The university allocates 9% to research and investigation.
- A revision of the statutes of the university has started covering mission, objectives, structure etc.

Plans for the future:

- The approval and implementation of the new university statutes
- The formulation of a strategic plan
- The implementation of the 1997-98 phase of the curriculum transformation process
- The development of instrument for evaluation
- Introduction of an automated student registration process
- Acquisition of resources to strengthen the laboratories for science and technology
- Acquisition of a modern bibliography resources according to the needs of the curricula
- Improvement of the scientific competence of teachers through post graduate courses
- Search for new partners for international co-operation
- Installation of a new node for connecting the university to Internet
- Improvement of the physical plant of the university

LA UNIVERSIDAD CENTROAMERICANA:

Changes during the last 4 years:

- A review of the university's mission, objectives and principles
- A curriculum development process with definition of length of programmes (4 years), basic elements, definition of credits, evaluation processes and personal development profile for the students leaving UCA

- Two basic requirements for UCA students were identified - the ability to speak one foreign language and the ability to use computers. This has led to heavy investment in computers and other physical resources
- A new library has been built. Tied to this has been acquisition of new books (1.000 volumes during the last three years) and an automation of library services. Since 355 of the users come from other universities, these changes are not only to the benefit for the UCA students and teachers
- The rules and regulations of the university have been revised
- The organisational structure has been redefined
- An automated registration system of students has been implemented
- Efforts have been made to develop the competence of the teaching staff. This has among other things led to 31 master degrees, 18 doctoral degrees

Plans for the future:

- Consolidate the identity of the university
- Develop an efficient strategy for management and administration which will strengthen the financial base of the university
- To initiate a process of internal evaluation for the first group of students in the 4 year programme. After this is completed the plans are to start a continuing curriculum revision process
- To improve the information system within the university
- To build a staff group which consists of the full time as well as the part time teachers
- To strengthen the students self development by creating space for communication and co-ordination between students and between students and teachers
- Improve co-ordination between graduate and postgraduate programmes
- Reactivate science and technology
- Create an innovative culture
- Create the necessary conditions for evaluation and accreditation
- Create programmes which not only give the students possibility to apply for employment, but also create employment
- Transform the curricula, disciplinary structures and pedagogy to focus on development of competence and permanent learning

UNI:

Changes during the last 4 years:

- Curriculum development which has led to the inclusion of a "componente humanístico" in all programmes
- All the programme and faculty activities should be based on a strategic plan
- Initiation of a revision of university rules and regulations

- Initiation of a self-evaluation process
- Implementation of the areas Informática Educativa and Planificación Urbana y Territorial

Plans for the future:

- Implementation of the planned curriculum changes and the concomitant strengthening of pedagogical, scientific and technical competence
- Development of strategic plans for each faculty
- Continuing revision of university rules and regulations
- Improve the academic quality through self-evaluation with the purpose of receiving future accreditation
- Promote the specialities of the UNI
- Development of a plan for investment in the physical plant of the university, the technological equipment and the libraries

UNA:

Changes during the last 4 years:

- The development has focused on three areas:
 - 1 Internal organisational and administrative development
 - 2 Institutional development
 - 3 Academic development
 - Curriculum and competence development
 - Research and investigation
 - External activities
- The internal organisational and administrative focus has encompassed areas like:
 - 1 Mission, objectives and principles
 - 2 Attempts to increase international founds
 - 3 Administrative control for resources
 - 4 Auditable financial accounting system
 - 5 Basic provision of health services for personnel
 - 6 Existence of means of transportation
- The institutional development includes areas like:
 - 1 Membership in CSUCA
 - 2 Increase in the number of national conventions held
 - 3 Membership of international co-operation networks
 - 4 Development of plans for areas of national significance like:
 - Educación agraria y forestal
 - Producción agropecuaria/forestal

5. Participation in important national commissions and committees

- The academic development includes:
 - 1 Definition of investigation within the university context
 - 2 Development of areas for investigation and research groups
 - 3 Creation of fora for the promotion of investigation
 - 4 Focus on curriculum development
 - 5 Focus on the pedagogical competence of the teachers
 - 6 Central register of students
 - 7 Activities extended to Juigalpa and Rivas
 - 8 Increase in the number of scientific events

Plans for the future:

The plans for the future include continued work in the areas listed above. One vehicle for this is the creation of discussion groups in areas like Desarrollo Curricular (Curriculum Development), Calidad de la Educación (Quality in Education) and Filosofía Investigativa (Research Methodology)

List of persons interviewed:

1. CNU: Lic. Mariano Vargas, Technical Secretary
2. UNAN-León: Dr. Ernesto Medina, Rector, Dra. Mercedes Abellán, Academic Vicerrector and the members of the Commission for University Reform: Hugo Sánchez, Wim Balladares, Bayardo Lara, José Antonio Saldaña
3. Swedish Embassy: Göran Holmqvist, Nils Öström, María Elena Gutiérrez
4. Ministry of Education: Dr. Tulio Tablada, Viceminister
5. SAREC-UNDP Project: Dr. Carlos Tünnermann: Advisor to the Project
6. CNU: Lic. Francisco Guzmán Pasos, President
7. PREAL and UCA: Dr. Juan Bautista Arrien
8. UCA: Dr. Xabier Gorostiaga, Rector, Dra. Mayra Luz Pérez, Academic Vicerrector, Director of Research, Director of International Relations, Advisor
9. UNAN-Managua: Lic. Francisco Guzmán Pasos, Rector and Directors of four research centers
10. CNU: Ing. Miguel Ernesto Vijil, former Technical Secretary
11. UNA: Ing. Guillermo Cruz, Rector, Alberto Sediles, Vicerrector, Secretary General, Deans, Research Project Directors
12. UNI: Ing. Arturo Collado, Rector, Vicerrector, Secretary, Deans and SAREC Project Directors
13. UPOLI: Lic. Sergio Dennis García Velásquez, Rector, Vicerrectors, Deans

Appendix 3: Documents consulted

Brunner, José Joaquín and Krister Eduards. Nicaragua: Higher Education and Research. SAREC. 1994.

National Council of Universities. Final Report on the Project NIC/92/031 "Support for the Process of University Reform and Modernization promoted by the National Council of Universities (CNU)". Technical Secretary of the CNU. Managua, January 1997.

Consejo Nacional de Universidades. Información Estadística de la Educación Superior de Nicaragua 1985 - 1994.

SAREC: Research Cooperation with Nicaragua 1994/95-1995/96, 1995

CNU: Informe final sobre la ejecución del proyecto NIC/92/031 "Apoyo al proceso de reforma y modernización universitarias promovido por el Consejo Nacional de las Universidades", 1997

PNUD. Marco de Cooperación del PNUD con el Gobierno de Nicaragua 1997 - 2000

Informe de la Universidad de Verano: La Habana. 1 setiembre 1995.

Inventario de Equipos Financiados por PNUD y SAREC de Febrero/94 a Julio/97

Informe Final del Curso de Verano de Alto Nivel sobre Gestión Universitario dictado en Nicaragua de Julio a Septiembre de 1995. Universidad de Los Andes, Santafé de Bogotá, Colombia

CNU. Informe Final: Capacitación Usuarios de Microis.

SAREC. Research Cooperation with Nicaragua 1994/95 - 1995/96. Jan. 13, 1995

SAREC. Evaluation of the SAREC supported research project in Geosciences in Nicaragua 1981-93.

Allebeck, Peter & Alberto Nieto. Apoyo proporcionado por SAREC a la investigación en ciencias de la salud en la Universidad Nacional Autónoma de Nicaragua. SAREC. Mayo de 1994.

Universidad Nacional de Ingeniería. La UNI en Cifras 1995-1996.

Universidad Nacional de Ingeniería. NEXO. Revista Científica. Año XI, No. 21, enero 1997.

UCA. Seminario Identidad y Desarrollo Institucional UCA. Documento de Trabajo. 15 y 16 de mayo de 1997. Managua, Nicaragua.

La Gaceta. Diario Oficial.

Appendix 4: Questionnaire

INFORMACION QUE DEBE SUMINISTRAR CADA UNIVERSIDAD

I. MODERNIZACION Y REFORMA UNIVERSITARIA

(Acompa e con los documentos que considere pertinentes).

1.  Qu  acciones de modernizaci n y reforma universitaria han llevado a la pr ctica en los  ltimos 4 a os?  Cu l ha sido el  xito de estas acciones?
2. Qu  planes de modernizaci n y reforma universitaria tiene la universidad para el futuro pr ximo?
3. Dentro de estos planes futuros,  cu l es la prioridad y por qu ?
4.  Qu  asistencia requerir  su universidad para llevar a la pr ctica su proyecto prioritario de modernizaci n y reforma universitaria?
5. Presupuesto institucional para 1996 - Ingresos:
Aporte estatal
Aporte internacional
Aporte nacional no estatal
Venta de servicios
6. Presupuesto institucional para 1996 - Egresos:
Por unidad acad mica
Por rubro presupuestario

II. INVESTIGACION Y POSGRADO

(Acompa e con los documentos que considere pertinentes).

1.  Tiene su universidad pol ticas de investigaci n?  Cu les son? Si no las tiene,  hay planes para establecerlas?
2.  Cu les son las l neas de investigaci n de su universidad y entre ellas cu l es la prioritaria?
3.  Tiene su universidad estructuras de apoyo a la investigaci n? Cu les son? C mo apoyan la investigaci n?
4.  Qu  porcentaje del presupuesto universitario se dedica a la investigaci n?  Con qu  otros recursos (montos) se cuenta para la investigaci n: aporte nacional privado y aporte internacional? Especifique.
5.  Existe alg n sistema de incentivos para la investigaci n y los investigadores?  En qu  consiste?
6. Lista de centros e institutos de investigaci n.
7. Lista de proyectos de investigaci n en ejecuci n y ubicaci n de los proyectos (por unidad acad mica, centro o instituto de investigaci n)
8.  Cu les de esos proyectos cuentan con financiamiento externo y cu l es el monto y la fuente de financiamiento para cada proyecto?
9.  Cu l es el procedimiento para la aprobaci n de un proyecto de investigaci n?
10.  Tiene un procedimiento establecido para evaluar los proyectos y actividades de investigaci n?  En qu  consiste?
11.  Existe un procedimiento para la evaluaci n institucional de la investigaci n y  reas espec ficas?  En qu  consiste?

12. Existen criterios para el otorgamiento de tiempo para que los profesores dediquen a la investigación.
13. Indique si ha habido participación de los investigadores en conferencias internacionales. ¿Cuáles?
14. Indique si ha habido publicaciones en revistas científicas reconocidas internacionalmente. ¿Qué artículos? ¿En cuáles? ¿En revistas nacionales? ¿Qué artículos? ¿En cuáles revistas?
15. ¿Qué porcentaje del personal en cada departamento que está involucrado en actividades de investigación?
16. ¿Cuál es la formación académica del personal docente que realiza investigación?
17. Número de profesores asociados a los procesos de investigación que están en formación (para maestría y doctorado).
18. ¿Con qué tipo de apoyo infraestructural cuenta la investigación?
Biblioteca: número de volúmenes asociados a los temas de los proyectos
Equipo informático y libros comprados con dineros de los proyectos
Otros
18. ¿Se realizan en su universidad congresos, seminarios, foros, relacionados con la investigación?
19. ¿Ofrecen los investigadores seminarios para otros profesores o estudiantes?
20. ¿Ofrecen los investigadores cursos científicos para otros profesores o estudiantes?
21. ¿Tiene su universidad programas de postgrado? En qué áreas?
22. ¿Tiene su universidad planes para abrir nuevos programas de postgrado? ¿En qué áreas?
23. ¿Cuál es la vinculación entre docencia e investigación, especialmente a nivel de los programas de postgrado?
24. ¿Cuál ha sido el impacto concreto de los proyectos de investigación en los planes de estudio de los programas de pregrado?

III. PERSONAL DOCENTE

(Acompañe con los documentos que considere pertinentes).

1. Regulaciones universitarias que determinan las condiciones de trabajo y salarios del personal docente de las universidades así como sus derechos y obligaciones.
2. Número de profesores y grados académicos de los profesores, para la institución en general y por unidad académica.
3. Dedicación de los profesores a la universidad: tiempo completo, tiempo parcial, profesores horarios, para la institución en general y por unidad académica.
4. Número de profesores permanentes y no permanentes.
5. Número de profesores de la institución expresados en equivalentes de tiempo completo.
6. Estructura salarial de los profesores y criterios para determinar los salarios de los profesores. ¿Cuáles son los salarios promedio (en córdobas) para tipos de profesores que ingresan a la institución y tipos de profesores que tienen 15 años de servicio, por categorías, por ejemplo?
7. ¿Existe la carrera académica en su institución? Por favor descríbala. ¿Cómo puede un profesor pasar de un escalafón a otro?
8. ¿Cómo se distribuye la carga académica de los profesores? ¿Cómo se controla la carga académica de los profesores? ¿Se tienen estadísticas institucionales acerca de la carga académica de los profesores? Si se tienen estadísticas, por favor incluirlas.

9. Existe un sistema de incentivos para los profesores? ¿En qué consiste? ¿Cómo se aplica? ¿Cuántos profesores en su institución se benefician de dichos incentivos.
10. ¿Tiene la institución información sobre los profesores que trabajan en otras instituciones o labores?
11. A manera de ejemplo, cite los tipos de trabajos que realizan los profesores de su universidad que trabajan fuera de la universidad.
12. Describa el tipo de condiciones de trabajo que tienen sus profesores: oficinas, computadoras, biblioteca, teléfono y otros elementos que contribuyan a realizar un buen trabajo dentro de la institución.

IV. RELACIONES UNIVERSIDAD-SECTOR PRODUCTIVO

(Acompañe con los documentos que considere pertinentes).

1. Tiene su universidad relaciones con el sector productivo del país? Qué tipo de relaciones?
2. Describa los proyectos específicos de relación con el sector productivo que se realizan en su universidad.
3. Cuáles son los planes que tiene su universidad para establecer, en el futuro, mayores vínculos con el sector productivo?
4. Tiene su universidad proyectos de “venta de servicios”? Qué tipo de proyectos? Qué monto genera su universidad por venta de servicios? Qué facultades, institutos o centros tienen actividades de “venta de servicios”?
5. Tiene su universidad alguna normativa que regule la “venta de servicios” en su universidad? Si la tienen, puede incluirla? Si no la tienen, hay planes para establecerla? Si no existe regulación actualmente, cómo se reparten los beneficios de la “venta de servicios”?

Appendix 5: List of Research Centers and Institutes

a) **UCA:**

- Instituto de Investigación y Desarrollo “Nitlapán”.
- Centro de Investigación y Documentación de la Costa Atlántica (CIDCA).
- Instituto de Historia de Nicaragua (IHN).
- Centro de Análisis Sociocultural (CASC).
- Programa de Promoción de la Reforma Educativa en América Latina (PREAL).
- Centro de Investigación del Camarón.
- Estación Solar “Vadstena”
- Herbario Nacional

b) **UNI:**

- DINOT (Renewable Energies)
- PIDMA
- Proyecto Biomasa
- Proyectos SAREC - Faculties of Electrotecnia and Chemistry
- Laboratorio de Turbinas Hidroeléctricas. School of Mechanical Engineering.

c) **UNAN-Managua**

- Centro de Investigación de Recursos Acuáticos (CIRA)
- Centro de Investigaciones y Estudios de la Salud (CIES)
- Instituto Nicaragüense de Investigaciones Económicas y Sociales (INIES)
- Centro de Investigaciones Socioeducativas (CISE)
- Centro de Investigaciones Económicas y Sociales (CIES)
- Centro de Investigaciones Geofísicas (CIGEO).

d) **UPOLI**

- Conservatorio Bautista de Música
- Instituto de Desarrollo Humanístico
- Academia de Medicina Homeopática y Terapias Alternativas
- Instituto Martin Luther King
- Instituto de Capacitación e Investigación en Desarrollo Rural Integral (ICIDRI)
- Instituto de Ciencias de Computación.

e) **UNAN-León** (Specialised laboratories):

- Laboratorio de Microbiología y Parasitología
- Laboratorio de Análisis Químico
- Laboratorio de Control Biológico de Plagas
- Laboratorio de Cultivo de Tejidos
- Laboratorio de Biología Celular.

Appendix 6: List of Research Projects

External Financing

UNAN-MANAGUA:

Facultad de Ciencias Médicas

US\$ 195.412

Diagnóstico Situacional de los Recursos Humanos en Salud

Análisis del Desempeño

VIH-SIDA

Micro-Nutrientes

Determinación de Hemoglobina

Instituto Politécnico de la Salud (IPS)

US\$ 24.043

Cuidado Materno-Infantil

Facultad de Ciencias de la Educación y Humanidades

Geografía Rural

Libro Tierra, Paraíso y Fuego

Estudio sobre la Pobreza

Historia de Nicaragua:Apuntes actualizados

Diccionario Fraseológico Nicaragüense

Diagnóstico de los Fenómenos del Norte del País

Diagnóstico sobre Geo-Turismo

Incendencia de la Enseñanza de la Lengua Francesa e

Inglesa en el Ecoturismo

Facultad de Ciencias

Estudio de Reptiles <iguánidos>

Plantas exóticas y ornamentales en Managua

Viabilidad de cultivos hidrofónicos

Uso de radiaciones en los hospitales

La realidad del 6%

Centro de Investigaciones Geo-Científicas (CIGEO)

US\$ 99.187

Estudio Geológico-Minero en la región nor-oeste de Nicaragua

Estudio Geológico-Minero en la zona norte del país

Estudio de Geofísica aplicada a la exploración

Estudio Geofísico e interpretación de imágenes de satélite para la elaboración del mapa gravimétrico y actualización del mapa geológico de Nicaragua, escala 1:1.000.000

Estudio Geofísico-Geológico en la ciudad de Managua para la actualización del mapa en fallas activas de Managua
 Estudio de Magnetometría en el área de Masaya-Granada
 Estudio de Geología y peligrosidad volcánica en el área de Masaya-Laguna de Apoyo
 Estudio de riesgo sísmico y peligrosidad volcánica en el área de Managua-cofradía
 Aplicación de métodos geofísicos en la exploración mineral, Distrito Minero de Bonanza
 Impacto ambiental por la actividad minera en el Centro Minero de Santo domingo-Río Siquia

Centro de Investigaciones y Estudios de la Salud (CIES)

US\$ 81.620

Modelo de Salud de la RAAN
 Perfil Profesional de Profesores de URACCAN
 Rescate de Experiencias Sociales para el Proceso de Reforma del Sector Salud en El Salvador y Nicaragua, 1990-1995
 Ajuste Estructural y Salud en Centroamérica. Area RED Centroamericana
 Análisis de la Equidad del Financiamiento de los Sistemas de Salud en Centroamérica y el Caribe
 Construcción de la Equidad en Centroamérica
 Análisis de la Eficiencia Hospitalaria

Centro de Investigación de los Recursos Acuáticos (CIRA)

US\$ 298.031

Proyecto para relacionar la presencia de Plaguicidas en la Salud de la población del Departamento de Chinandega
 Estudio Binacional de Plaguicidas en la cuenca de Río San Juan
 Efectos Agroecológicos resultantes del uso persistente de Plaguicidas en América Central
 La presencia de Plaguicidas en los Acuíferos de León y Chinandega

Centro de Investigaciones Socio Educativas (CISE)

Evaluación de los Cursos de Verano de la UNAN-Managua
 Inserción de los egresados de los Cursos de Nivelación de 1995 y 1996 en las carreras que ofrece la UNAN-Managua

Escuela de Economía Agrícola (ESECA)

US\$ 67.287

UCA

Instituto Nitlapán

Políticas macroeconómicas	US\$ 28.000 (Universidades belgas)
Políticas agropecuarias	US\$ 30.000 (Universidades belgas)
Sectores sociales del campo	US\$ 40.000 (Universidades belgas)
Mercados financieros rurales	US\$ 34.000 (Universidades belgas)
Agro-industria y comercialización	US\$ 27.000 (Universidades belgas)
Metodologías de intervención rural	

Departamento Psicología

La violencia intradoméstica

PREAL

La reforma educativa en Centroamérica	US\$ 12.000 (Fundación Ford)
La reforma educativa en Nicaragua	US\$ 8.000 (Rädda Barnen)

Instituto de Historia

Geografía, identidad y patriotismo 1838-1858
Impacto económico-cultural de la ruta trans-itmica en las
zonas vecinas 1849-1855
Cofradías en Nicaragua 1700-1812
Indígenas del Pacífico y Centro-Norte
Artesanos y obreros urbanos 1870-1912

Dirección de Investigación

La producción artesanal urbana

Departamento Estudios Generales

Recopilación de documentación colonial

Instituto CIDCA

Manejo de recursos naturales en el Atlántico	US\$ 20.000 (SAREC)
La cuenca de la Laguna de Perlas	US\$ 15.000 (SAREC)

Centro solar VADSTENA

Radiaciones solares

US\$ 20.000

Fac CC Agropecuarias

El cultivo del camarón

US\$ 40.000

(Japón + Iglesia Sueca)

Malacología

US\$ 12.000

(Japón + Iglesia Sueca)

Bosque tropical húmedo

US\$ 20.000

(Iglesia Sueca)

Herbano Nacional-UCA

Taxonomía botánica

Instituto CASC

Descentralización municipal

US\$ 27.000

(Fundación Ford)

Asociaciones municipales

US\$ 35.000

(Fundación Ford)

Sociocultura del embarazado adolescente

US\$ 30.000

(FNUAP-Nicaragua)

UNI**Facultad de Arquitectura**

Diseño de elementos de ferrocemento y su aplicación a viviendas de interés social

Selección de materiales y sistemas constructivos para vivienda de bajo costo

Implementación del bambú para construcción de viviendas de bajo costo

Sistemas Constructivos con Concreto Aligerado

Aplicación Contemporánea de los sistemas: Adobe y Taquezal

Alternativas de Diseño y Construcción en madera

Estudio del Ordenamiento Urbano

DINOT

Eficiencia Energética del Minisistema Hidroeléctrico del Poblado del Cuá

Construcción de Letrinas Aboneras de Fibra de Vidrio

Diseño de un Sistema Fotovoltáico en Siuna

Instalación de un Sistema Solar en Alamikamba

Sistema Solar para Refrigeración de Vacunas en Hospitales Rurales

Sistema Solar para Agua Caliente en Hospital Aldo Chavarría
 Secador de Granos en la Costa Atlántica
 Construcción de un Horno de Cacarilla para Secar Café
 Determinación de la demanda Energética de Leña para dos grandes sectores consumidores

Proyecto Biomasa

(Sucher and Holtzer, Austria)

Compostaje de la Basura en Masaya
 Planta de Tratamiento de Aguas Residuales del Matadero CARNIC
 Evaluación del Funcionamiento de las Lagunas de Estabilización de Masaya
 Diseño de un Planta de Tratamiento de Aguas Residuales en IUCASA
 Aplicación de Hornos de Marango a varios cultivos
 Biodisel a partir del truto del Temapate
 Investigación sobre el Flocculante Natural del Marango

Laboratorio de Turbinas

Calidad de turbinas Hidráulicas-Ahorros
 Construcción de Nano Centrales Hidroeléctricas
 Diseño, Construcción y Montaje de Microcentrales Hidoeléctricas

PIDMA

(UDELF-HOLANDA)

Evaluación de Contaminación del Lago de Managua
 Modelos Matemáticos para Redes de Distribución de Agua
 Pretratamiento de Agua mediante Galería y Filtro Grueso
 Efectividad de Coagulantes en Aguas Superficiales
 Construcción y Monitoreo de un Alcantarillado Simplificado
 Uso de Macrófitas en el Tratamiento de Aguas Residuales Domésticas
 Tecnología Anaerobia para Aguas Residuales de Managua
 Efectividad del Relleno Sanitario Manual
 Tratamiento de Residuos Líquidos y Sólidos Aplicando Microorganismos Efectivos
 Optimización de la filtración lenta en Potabilización de Aguas
 Formación de Lodo Granular en Reactores UASB
 Tratamiento del Lixiviado de Relleno Sanitario

Evaluación de la Contaminación Atmosférica de Managua
 Análisis de Productos de Cloro y Dosis a Utilizar

Facultad de Ingeniería Química

(SAREC)

Diseño de Secadores Agrícola-Industriales
 Determinación de propiedades de transporte en sistemas multicomponentes
 Simulación del Proceso de Cristalización por Enfriamiento

Batch y semi-continuo
 Cristalización por Cambio de Solvente
 Extracción de Aceite de las Semillas del NIM
 Desarrollo de Tecnología para producir Biofertilizantes a partir de Azobacter Chroccocum
 Métodos Analíticos para determinar y especiar Metales y Aplicación al Estudio Químico del Lago Xolotlán

Facultad de Electrotecnia

(SAREC)

Sistemas de Control Industrial y Comunicación de Datos
 Soluciones Tecnológicas para la Industria
 Software para la Enseñanza de Ciencias Exactas
 Aplicaciones Informáticas para la Educación
 Universidad Virtual Centroamericana

UNAN-León

Area de Ciencias

Resistencia de las plagas a los insecticidas	US\$ 17.000
Uso de alternativas biológicas en cultivo de tomate	US\$ 1.090
Estudios demostración en campo de parcelas demostrativas del uso racional de plaguicidas	US\$ 1.000
Cultivo de Tejidos de Musácou	US\$ 139.942
Manejo de Cultivos Alternativos: Tomate, para la Producción de Semillas y la extracción de aceite combustible	US\$ 84.000
Programa Maestría en Control Integrado de Plagas y Maestría en biología de la Conservación	US\$ 3.944
Tratamiento de Basura Orgánica utilizando Inoculantes Microb.	US\$ 2.000
Muestreo del Aire en la ciudad de León	US\$1.283
Transformación curricular en el tema de plaguicidas	US\$ 18.384
Fortalecimiento del laboratorio de química	US\$ 1.872

Area de Salud

Estudios de la vacuna contra Cólera	US\$ 15.557
Estudios para la vacuna de la Repatitis	US\$ 24.379
Análisis de Medicamentos	US\$ 1.600
Una Nueva Iniciativa en Salud	US\$ 600.000
Técnicas epidemiológicas para el control de enfermedades	US\$ 1.600
Diseño de instrumento de conducción de la salud	US\$ 3.000
Fortalecimiento de la promoción de Salud aplicada com estrategia de vigilancia de la salud	US\$ 3.000
Estudios operativos sobre detección de reacciones adversa a las vacunas del PAI en menores de 5 años y mujeres en edad fértil	US\$ 1.300
Taller de capacitación para el montaje de la red para la prevención y atención a personas afectadas por la violencia intrafamiliar	US\$ 478
Taller de capacitación en género a profesores del área de la	US\$ 750

salud ambiental de la UNAN-León	
Evaluación y manejo de riesgos por exposición de plaguicidas	US\$ 2.240
Antígenos bacterianos	US\$ 34.004 (SAREC)
Microbiología y Parasitología	US\$ 35.312 (SAREC)
Estudios de Amebiasis	US\$ 18.618 (SAREC)
Estudios de Chagas	US\$ 14.386 (SAREC)
Estudios de Anaeróbicos	US\$ 5.308
Salud Ocupacional	US\$ 22.234 (SAREC)
Salud Mental	US\$ 7.847 (SAREC)
Reproducción y Salud Infantil	US\$ 27.465 (SAREC)
Soporte para la Facultad de Medicina	US\$ 28.773 (SAREC)
Desarrollo de un modelo de gestión intermunicipal autosostenible para el suministro de medicamentos a municipios seleccionados del Dpto. De León	US\$ 4.000
Curso de Epidemiología general	US\$ 3.000
Evaluación y manejo de riesgo por exposición de plaguicida	US\$ 2.300

UNA

Plan Nacional de Investigación y Educación Superior en el área de los Recursos Naturales Renovables en Nicaragua	US\$ 63.000 (SIDA-SAREC)
Institutional support	US\$ 235.849 (SIDA)
Curriculum development	US\$ 47.170 (SIDA)
Planning of PhD projects	US\$ 59.299 (SIDA)

FARENA

Fortalecimiento de la gestión de la mujer en las unidades de producción campesina	US\$ 8.000 (FAO, Noruega)
Fondos remanentes del proyecto	US\$ 120.000
UNA/LUW/CCFF/SUELOS	(NUFFIC, Holanda)
Programa de apoyo a la agricultura sostenible en Laderas de América Latina	US\$ 19.000 (COSUDE, Suiza)
Soil Productivity Indexes and their erosion sensitivity	US\$ 72.583

(European Community)

CENIDA

Modernización del Centro Nacional de Información y Documentación Agropecuaria US\$ 88.949
(SIDA-SAREC)
Diseminación de información sobre Manejo de Recursos Naturales para una Agricultura Sostenible en América Tropical US\$ 8.200
(Fundación Kellogg)

Facultad de Ciencia Animal

Manure from pigs feed resources as feedstock for digesters and fish ponds US\$ 11.148
(International Foundation for Science)
Bases para el uso potencial de la raza Reyna en el marco del sistema de producción lechera en Nicaragua US\$ 224.000
(Centro Internacional CROCEVIA, Italia)
Maestría en Sistemas Integrales de Producción Agropecuaria en el Trópico (Universidad Autónoma, Barcelona)

Facultad de Agronomía

Evaluación del impacto de Endosulfón y otras prácticas de manejo de mosca blanca y gusanos del fruto y sus enemigos naturales en el cultivo del tomate US\$ 6.000
(IAEA/FAO, Viena, Austria)
Evaluación de resistencia de plagas a plaguicidas de uso común en Nicaragua US\$ 15.000
(Banco Mundial)
Evaluación de enemigos naturales de plagas de repollo y plantas hospederas en el Tisey, Estelí US\$ 5.071
(ADESO, Holanda)
Prospección, inventario, caracterización y colecta *in situ* de frutales nativos tropicales US\$ 16.836
(International Plant Genetic Resources Institute)
Utilización de organismos benéficos US\$ 9.000
(EM Technologies Inc)

Facultad de Educación a Distancia y Desarrollo Rural

Evaluación del comportamiento de Eisenia foetida con diferentes tipos de estiércol para la producción de abono orgánico y carne US\$ 1.124
(Italia)
Rentabilidad Económica de Sistemas Agroforestales US\$ 1.300
(PASOLAC, Suiza)

DIEP

Plant Science Program US\$ 171.159
(SIDA-SAREC)
UNA research Council US\$ 67.385
(SIDA-SAREC)

UPOLI

UPOLI does not receive
any external financing

Escuela de enfermería

Motivación por la investigación Científica que tienen las docentes de las Esc. de Enfermería de Managua
Liderazgo en Enfermería en los Hospitales
Sistema vigente de elaboración y evaluación de Monografías en UPOLI
Mujeres, trabajo y lactancia materna
Percepción de la imagen de UPOLI por los diferentes actores sociales internos y externos
Condiciones higiénico-sanitarias de los alimentos que se espenden en UPOLI
Cultura organizacional de los docentes y autoridades administrativas de UPOLI

Escuela de Estadística

Orientación Vocacional y Mejoramiento de la O.V. y su impartición a los estudiantes del V a ño del Instituto Edgard Arvizú

Departamento de Investigación y Postgrado

Valoración de las actuales políticas de Investigación y Desarrollo Científico de la UPOLI

Departamento Docente Metodológico

Validación de las Carreras de la UPOLI

Centro Abscrito: Conservatorio Bautista de Música

Desarrollo Evolutivo de la Música Autoctona
Valoración del pensamiento humanista en América

Centro Abscrito: Instituto de Desarrollo Humanístico

La Convención Bautista en la Década de los 80: factores que determinaron su rol político
Avances de las reformas Universitarias
Mujer y Familia en Bo. Jorge Dimitrov
Proyecto para la creación del Centro de Estudios Latinoamericanos

Academia de Medicina Homeopática y Terapias Alternativas

Efectos mentales de medicamentos Homeopáticos en pacientes tratados por enfermedades físicas

Centro Abscrito: Instituto Martin Luther King

Bases bíblicas-teológicas para la Cultura de Paz

Administración pacífica de conflictos: Teoría, técnicas y casos

Fundamentos de una cultura de paz en Nicaragua

Centro Abscrito: Instituto de Capacitación e Investigación en Desarrollo Rural Integral

Factores que influyen en mejorar la calidad de la enseñanza a nivel de primaria

Diagnóstico de la ciudad de Masatepe para determinar planes de desarrollo integral

Aprovechamiento integral de los patios y mejoramiento del hogar por medio de tecnologías apropiadas en la zona de Río San Juan

Appendix 7: Post graduate programmes in Nicaraguan universities

Postgraduate Programmes offered at the present time:

1) **UCA:**

- Masters Degree in International Relations
- Masters Degree in Business Administration
- Masters Degree in Economics and Development.

2) **UNI:**

Masters Degree in Environmental Engineering

3) **UNAN-Managua:**

Faculty of Educational Sciences and Humanities:

- Methodology of Research
- Environmental Education and Natural Resources
- Anthropology
- History
- Spanish Philology
- University Teaching

Faculty of Medical Sciences: Postgraduate Programmes in 17 different specialities

Faculty of Economic Sciences:

- Political Economy and Development
- Formulation and Evaluation of Projects
- Economic Policies.

4) **UPOLI:**

No information available

5) **UNA:**

- Masters Degree in Sistemas Integrales de Producción (Cooperación Española): 40 participants (17 from UNA).
- Doctorados en campos: Sistemas de Labranza, Manejo de Malezas y Fertilidad de Suelos (Swedish Cooperation) 3 participants from UNA

6) **UNAN-León:**

- Masters programme in Public Health
- Masters programme in Integrated Management of Plagues
- Masters programme in Analytic Chemistry
- Masters programme in Statistics and Operative Research
- Masters programme in the Didactics of Physics
- Masters programme in Public Law
- Speciality in English
- Speciality in Environmental Management
- Speciality in Aquaculture
- Speciality in Dentistry

There are plans to establish new postgraduate programmes as follows:

1) **UCA:**

- Central American Masters Degree in Business Administration
- Masters Degree in International Co-operation

Medium term:

- Doctorate in Business Administration
- Masters Degree in Economic Law
- Masters Degree in Psychology
- Masters Degree in Education.
- Postgraduate Programme for Small Enterprises

2) **UNI:**

No information available

3) **UNAN-Managua:**

- Faculty of Educational Sciences and Humanities: Distance Education and Educational Policies
- Faculty of Medical Sciences: Sexual and Reproductive Health.

4) **UPOLI:**

No information available

5) **UNA:**

- Management of Natural Resources
- Ecological Agriculture
- Food Systems
- Administration of Research
- University Didactics.

6) **UNAN-León:**

- Masters programme in Mathematics
- Masters programme in Biochemistry
- Masters programme in Microbiology

Department for Research Cooperation,
SAREC
M Lindroos

1997-06-15

Diarienummer

TERMS OF REFERENCE FOR THE FOLLOWING STUDIES:

I OVERVIEW OF RESEARCH AND HIGHER EDUCATION SYSTEM IN NICARAGUA

II IMPACT OF EFFORTS TOWARDS A UNIVERSITY REFORM IN NICARAGUA

Since 1981, SAREC¹ has provided support for Swedish bilateral research cooperation with Nicaragua. The prime objective of the cooperation is to strengthen the Nicaraguan research capacity and to promote research work of high relevance to the development of Nicaragua. At present four Nicaraguan universities are participating in the Sida/SAREC supported research cooperation with Sweden in the areas of health, natural resources and technology. In addition, during 1994 - 1996, SAREC, together with UNDP, provided support towards a Nicaraguan university reform under the leadership of the National University Council (CNU).

A SAREC study of the Nicaraguan system of higher education and research was made in 1993 by J. Brunner and K. Eduards. The report of the study was one of the base documents for SAREC's decision to support the first phase of the university reform process, a project for improvement of the administration and management systems, during 1994-96.

The purpose of the present study is two-fold and the consultancy herewith consists of two different tasks: 1) to provide an overview of the present system for higher education and research in Nicaragua, and 2) to describe and assess the achievements of CNU and the universities towards a reform for the development of higher education and research in Nicaragua.

¹Since July 1995 SAREC is the Department for Research Cooperation at Sida, The Swedish International Development Cooperation Agency.

Sida/SAREC's current agreement on bilateral cooperation with Nicaragua comes to an end in December 1997. The report from this study is expected to serve as an input into Sida/SAREC's decision regarding future support to the higher education and research in Nicaragua.

The primary aim of SAREC's assistance is to create sustainable conditions for research and research management in the faculties and to support research of high relevance for the development of Nicaragua. Strategic faculty programmes for research are crucial for advanced higher education. An institution which can be responsible for research training and possibly own postgraduate programmes, will also attract teaching staff who are stimulated by a creative environment. In addition to that, an efficient administration and decision making structure, and a capacity to handle policy development and planning at the faculties are essential for the development of higher education and research. To this end, SAREC's present project-oriented support to the universities will be directed towards support for a more holistic institutional development.

1 Study I:

OVERVIEW OF RESEARCH AND HIGHER EDUCATION SYSTEM IN NICARAGUA

1.1 Terms of Reference

The objective of the study is to provide a descriptive overview of the system of higher education and research in Nicaragua including the university structure and other structures for research in Nicaragua (ref. Brunner et al). In addition to that, the Consultants are requested to make comments on the situation in relation to possible changes during the last years and in relation to options for future change and development.

The description shall cover the following items:

1.1.1 An overview of the present system for higher education and research

The existing policies for higher education and research.

A general presentation of higher education institutions, focusing on university level education, and other research bodies (governmental and private) and their mandates.

A general presentation of the National University Council, CNU, and its mandate and role in policy making, financing and implementation of efforts towards a university reform. Degree of output from CNU's activities.

Shortcomings and bottlenecks.

The financing structures showing channels, sources and flows of funding higher education and research. The proportion of national budget resources as well as external support destined to the university sector (undergraduate training and research respectively). The system of resource allocation between the universities. Possible changes in the future and their impact on the higher education system.

1.1.2 Research and research training in Nicaragua

Research policy and priorities at central and sectorial levels; mechanisms for planning, implementation, evaluation and follow-up of research and research training in Nicaragua. Demands for research results in the health, natural resources and industrial sectors, and the national capacity to meet these demands.

Research resources in the universities: human resources, infrastructure, administrative capacity and funding resources, particularly in the autonomous national universities, UNAN-León and UNAN-Managua, the University of Technology, UNI, and the University of Agronomy, UNA ² and the faculties presently receiving SAREC support. The mechanisms of access to and dissemination of research results.

The post-graduate programmes in the Nicaraguan universities. What is the potential capacity of the existing system to meet Nicaragua's research priorities and requirements? The demand for post-graduate staff (teachers, researchers) at the universities and career opportunities for academically trained work-force in the private and parastatal industrial sector.

The main international research bodies and programmes operating in Nicaragua and their relationship with local research structures. The modes of implementation preferred by these organisations. Their ways of channelling financial resources to research and training in Nicaragua.

²UNAN-León, Universidad Nacional Autónoma de Nicaragua in León; UNAN-Managua, Universidad Nacional Autónoma de Nicaragua in Managua; UNI, Universidad Nacional de Ingeniería; UNA, Universidad Nacional Agraria.

For further instructions, see paragraph 3.

2 Study II:

IMPACT OF EFFORTS TOWARDS A UNIVERSITY REFORM IN NICARAGUA

2.1 University reform

In 1993 the National University Council (CNU) drew up policies and strategies towards a university reform in Nicaragua. A programme, which aims at modernization and renewal of the higher education system, is planned to successively cover the academic and teaching areas, research, extension, the administrative area and financing.

As a first step of this programme, CNU initiated in 1994 a project in support of administration and management of universities.

Modernization of the two functions were seen as a base for the further reform process. The project was financially supported by UNDP and SAREC. The specific goals of it were stated as follows:

- * To create an executive office within CNU, that will coordinate with the member-institutions, establish an information system for HE and publish relevant material.
- * To initiate an information exchange network throughout the HE system, technically assist the universities in building their own information systems, and provide institutions access to international information networks.
- * To train academic managers and staff who will participate in planning and evaluation activities and support universities in the designing of their institutional development plans.
- * To help universities in the design and implementation of their administrative and budgetary systems, train personnel to this effect and to support institutions in the management of international cooperation programmes.
- * To organize a series of workshops on academic and scientific development of Nicaraguan HE institutions.

The above project under the leadership of CNU was carried out in 1994 - 1996. Contemporaneously with the CNU project the modernization of the administrative and management functions was initiated at the universities.

2.2 Terms of Reference

The objectives of the study are to

Describe the existing plans for a university reform and a demand for that in Nicaragua;

Describe the achievements of CNU towards improving the university system;

Assess the efficiency of the implementation of change until date, and it's impact on the development of the HE system and research on the institutional and national level.

2.2.1 A study of the achievements and impact of the reform process

the Consultants shall perform the following tasks:

Describe and discuss the potential for a national university reform, needs, goals, relevance, orientation and methods of implementation. What are the main reasons for a reform? Who benefits from a change? Who are against it? What are the perspectives for a further reform process during the next few years?

Describe the present role of CNU in general and in relation to the reform activities. What are the goals of CNU for improvement of the system for higher education and research? What is the impact of CNU's support until date on the development of the higher education system and research on the institutional and national level.

Discuss CNU's role and authority in relation to options for future change and development of the system of higher education and research in Nicaragua. CNU is planning a phase 2 project towards the reform. What are the contents of this project?

Report on the achievements since 1993 (ref. Brunner et al) for improvement of administration and management in the universities, especially each of the national universities UNAN-León, UNAN-Managua, UNI and UNA. In what way has the implementation of change been efficient through the above-mentioned support from CNU? What has not been addressed?

2.2.2 Recommendations by the Consultants

In addition to the above, the Consultants shall

Draw conclusions and make recommendations in respect of the use of resources (internal and external) for a continued implementation of efforts towards the university reform. To

what specific purpose and to which organization (CNU and/or universities) should, in the Consultants' opinion, external resources be addressed in order to support the process most efficiently.

Make recommendations regarding the reforms that should be given a priority with the aim of promoting the development of research and higher education at each of the universities presently supported by Sida, i.e. UNAN-León, UNAN-Managua, UNI and UNA.

3 Common instructions for Study 1 and 2

In the light of their findings from both studies and the criteria indicated in the Background, the Consultants will discuss the optimal use of external resources, particularly the support that SAREC can offer, for a sustainable research development in Nicaragua. The balance between a project support and a broad institutional support (as presented in the SAREC report "The ownership and cultivation of knowledge", Annex 3) is also discussed in the Nicaraguan context.

The Consultants are free to add and comment upon issues of relevance to the Nicaraguan university system and university reform apart from what has been described in this Terms of Reference.

The Consultants will be briefed by SAREC and arrangements will be made for meetings with resource persons in Nicaragua.

4 Implementation, Time table and Reporting

The studies will be carried out by a team of two Consultants of which one will be the team leader. The evaluation visits will take place during August - September 1997. A draft report in English will be presented to Sida/SAREC not later than 1 October 1997. A final report will be presented no later than 3 weeks after the Consultants have received SAREC's and CNU's comments on the draft report.

The final report shall be delivered on paper as well as diskette (compatible with Word 6.0 for Windows) and follow the enclosed format for consultancy reports (Annex 4). The report should begin with an executive summary of not more than five pages and close with a section containing the Evaluator's conclusions and recommendations in particular on SAREC's possible future support towards the university reform and development of research in Nicaragua.

The report will be made public and it will be used and distributed by Sida/SAREC in its entirety or in parts. The final report will be

published in the Sida Evaluations series. A summary for Sida Evaluations Newsletter has to be written by the Evaluators and a special form "Sida Evaluations Data Worksheet" (Annex 5) has to be filled in for Sida's Evaluation Unit.

5 Remuneration and Travel Costs

These are set out in the accompanying Contract.

Enclosures:

Annex 1. José Joaquín Brunner, Krister Edwards (1994), "Nicaragua, Higher Education and Research"; SAREC, Stockholm

Annex 2. Report on the University Reform project promoted by CNU.

Annex 3. SIDA/SAREC report: "The Ownership and Cultivation of Knowledge, the rationale for Swedish support to universities in developing countries".

Annex 4. Sida Evaluations Newsletter: Instructions for Evaluation Managers and Consultants.

Annex 5. Sida Evaluations Data Worksheet.

C:\MLI\NIC\97HE.NIC

Recent Sida Evaluations

- 97/40 Swedish Labour Market Projects in Estonia 1994-1996. Susanne Oxenstierna, Henrik Huitfeldt
Department for Central and Eastern Europe
- 98/1 Sida Support to Telecom in Southern Africa. Lennart Königson, Karl Erik Olofsson, Kalevi Nykänen, Åsa Königson
Department for Infrastructure and Economic Cooperation
- 98/2 Sida Support to the Banking Sector in Vietnam. Nguyen Van Dinh, Peter Gisle, Lisa Román, Börje Wallberg
Department for Infrastructure and Economic Cooperation
- 98/3 Swedish Labour Market Projects in Lithuania 1995-1997. Susanne Oxenstierna, Henrik Huitfeldt
Department for Central and Eastern Europe
- 98/4 Den mänskliga faktorn. Samarbete mellan svenskt postväsende och den regionala posten i St Petersburg, Ryssland. Lars Rylander
Department for Central and Eastern Europe
- 98/5 Apoyo de Asdi al Programa Nacional de la Mujer en Bolivia. Marina Subirats, Åsa Westermark
Department for Latin America
- 98/6 Sustainability and Partnership. Sida supported cooperation between Swedish and Baltic Non-governmental Organisations. Peter Winai
Department for Central and Eastern Europe
- 98/7 Sewerage and Water Sector Projects in Egypt. Nigel Nicholson, Nemat Guenena
Department for Infrastructure and Economic Cooperation
- 98/8 Sida Support to ten Projects at the Geological Surveys of Estonia, Latvia and Lithuania. Torsten Toksvad, Janis Prols.
Department for Central and Eastern Europe
- 98/9 Programas de MCED/DERECHOS del Niño de UNICEF en América y en el Centro Internacional para el Desarrollo del Niño de UNICEF(ICDC). Benno Glauser, Eva Lithman, Riccardo Lucchini
Department for Latin America
- 98/10 Swedish Support to the Power Sector in Vietnam. Bo Sedin
Department for Infrastructure and Economic Cooperation
- 98/11 Public Auditing in Southern Africa. Kathy M Higgins, Matsobane Putsoa
Department for Democracy and Social Development
- 98/12 The Asian Regional Research Programme in Energy, Environment and Climate. J M Christensen, G A Mackenzie
Department for Research Cooperation SAREC

Sida Evaluations may be ordered from:

Infocenter, Sida
S-105 25 Stockholm
Phone: (+46) 8 795 23 44
Fax: (+46) 8 760 58 95

A complete backlist of earlier evaluation reports may be ordered from:

Sida, UTV, S-105 25 Stockholm
Phone: (+46) 8 698 5133
Fax: (+46) 8 698 5610



SWEDISH INTERNATIONAL DEVELOPMENT COOPERATION AGENCY
S-105 25 Stockholm, Sweden
Tel: +46 (0)8-698 50 00. Fax: +46 (0)8-20 88 64
Telegram: sida stockholm. Postgiro: 1 56 34-9
Homepage: <http://www.sida.se>