

Sida contribution 75007296 CNU-SIDA-INASP Project 2008 – 2011

Strengthening research information production, access and use in Nicaragua

Final Project Report

December 2011

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Acronyms and Abbreviations

Asdi	Swedish International Development Cooperation Agency (Sp)
BICU	Bluefields Indian & Caribbean University (BICU)
CENIDA	Centro Nacional de Informacion y Documentacion Agropecuaria
EIAG	Escuela Internacional de Agricultura y Ganadería. Rivas- Nicaragua (EIAG)
ICT	Information and Communication Technology
INASP	International Network for the Availability of Scientific Publications
MEERU	Monitoring and Evaluating Electronic Resources and Usage
PERii	Programme for the Enhancement of Research Information ii
Sida	Swedish International Development Cooperation Agency
UCA	Universidad Centroamericana
UCATSE	Universidad Católica Agropecuaria del Trópico Seco
UNA	Universidad Nacional Agraria
UNAH	Universidad Nacional Autónoma de Honduras
UNAN, Managua	Universidad Nacional Autónoma de Nicaragua
UNAN, León	Universidad Nacional Autónoma de León
UNI	Universidad Nacional de Ingeniería
URACCAN	Universidad de las Regiones Autónomas de la Costa Caribe Nicaragüense

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Executive summary

This report summarises the activities undertaken as part of a 3 year collaborative project (April 2008 – June 2011) aimed at improving research in Nicaragua. The partners, Consejo Nacional de Universidades (CNU) represented by Universidad Nacional Agraria (UNA), the International Network for the Availability of Scientific Publications (INASP) and the Swedish International Development Cooperation Agency (Sida), worked together on development of a detailed plan and budget to support this aim.

Adopting a holistic approach, the project planned on strengthening access and usage of electronic resources, and the production and dissemination of research in a sustainable manner by:

- supporting access to online research information;
- building institutional and national capacities to subscribe to, manage and use online information resources;
- strengthening journal publication processes and capacities;
- strengthening researchers' access to and use of international and national research publications.

Whilst it will take time to establish the project's contribution to Nicaraguan research culture, there are positive indicators and overall consensus is that this has been a particularly successful project. It has succeeded in achieving the specified objectives, and signs for sustainability are extremely encouraging. Access to reliable and high quality information, production and diffusion of research in higher education and the capacities of librarians, editors, researchers and users of information have been greatly enhanced. Usage of resources has increased from 3,123 full-text articles downloaded in 2008 to 18,910 by 2010. A new system to help promote local research - LAMJOL, has recorded monthly visits up this year from 281 in January to 1,931 by June. The training provided both nationally and institutionally has enhanced skills of over 10,000 participants. New or strengthened networks have been developed including between academics, students and faculties institutionally; between participating institutions within Nicaragua; and externally with regional and international partners.

In addition to the provision of high quality and relevant databases, issues to emerge as central to successful implementation include:

- Timing appropriate for the education and research communities to be receptive to a programme focusing on accessing, creating and sharing online information.
- A collaboratively developed plan with sufficient detail and adequate funding. Complemented by annual progress review and institutional operating plan.
- Effective coordination so that the appropriate infrastructure and skills were in place to enable access when the resources were made available.
- Personnel committed to implementing the project components.
 - Effective lead Coordinator to steer the project and activities, and to coordinate work with different stakeholder groups - librarians, researchers, ICT personnel, journal editors and decision makers;
 - Creation of a PERii team, under the leadership of the library director, in each of the participating institutions;

- Central contact person in-country and at INASP and Sida;
- Support of the senior administration at CNU and at member institutions.
- Local ownership both at a national and an individual institutional level.

If planning a similar project and given that the local and prevailing context is deemed appropriate, important lessons can be taken and applied, especially on approach and implementation. A follow up review in 3-5 years is recommended in order to establish the longer term impact of the project.

1. Introduction

This report provides a review of the activities undertaken as part of a 3 year collaborative project initiated by Universidad Nacional Agraria (UNA) and aimed at improving research in Nicaragua. The partnership consisted of the Consejo Nacional de Universidades (CNU, <http://www.cnu.edu.ni>), the International Network for the Availability of Scientific Publications (INASP, www.inasp.info) and the Swedish International Development Cooperation Agency (Sida, www.sida.se). Adopting a holistic approach, incorporating the various components of the research cycle and working closely with national higher education institutional libraries and research institutions, the project commenced in May 2008 and completed on 30 June 2011.

The focus from the beginning centred on enhancing the information and documentation services of the libraries and strengthening access to electronic resources and scientific journals. This was then built on by fostering capacity and systems in development of research publication mechanisms. Along with objectives and associated activities, the report provides background and information on the practicalities of the partnership, the approach adopted and main points of learning. The content is based on a mixture of quantitative and qualitative feedback collected from online surveys and reports, including the detailed 2011 bibliometric project report, and through personal observation, interviews, meetings and institutional visits.

2. Background

At the instigation of CNU and in response to their identified need, INASP, through its Programme for the Enhancement of Research Information (PERii) was invited to work together with CNU and Sida on a joint project supporting the advancement of research in Nicaragua. By adopting a holistic approach and with sustainability as an overarching driver, they sought to integrate the project work into the wider organizational culture and structures and to foster a collaborative approach across the various stakeholder groups. Along with access to information, developing local capacity and fostering a supportive environment for continued development of a research culture in Nicaragua were seen as essential to the achievement of sustainable outcomes.

Facilitated by INASP and hosted by UNA, a detailed plan was jointly developed in 2006-07. Section 3 lists the objectives and provides an overview of the activities and outcomes related to each of the specific objectives. Annex 1 contains the complete plan including schedule and budget. A lead coordinator, Ruth Velia Gomez, was selected by CNU to coordinate and direct implementation and to be the point of contact for Sida and INASP as well as nationally. A central contact person at Sida and INASP was also identified for the duration of the project.

Figure 1 Lead coordinator, Ruth Velia Gomez,
at launch of the project 2008



3. Project objectives, associated activities and outcomes

Along with the listing of objectives, this section provides information on the activities implemented. Assessment on achievement of objective is provided based on collated evidence.

General objective

To improve research outcomes and processes within Nicaragua by increasing the capacities of the university library and research systems to:

- access digitally based research focused information;
- utilize such information in the research process;
- strengthen the production of local research information and publications.

Specific objectives

1. To provide access to relevant, high quality international research publications in electronic formats to researchers within Nicaraguan university and public research institutions.
2. To develop and strengthen the skills and capacities of Nicaraguan university and research library staff in order that they can provide researcher focused digital library services.
3. To strengthen ICTs used to support access to research information within targeted institutions.
4. To strengthen the national research output publication mechanisms of journals and online publications systems. To increase the visibility of Nicaragua through research publication and open access publishing
5. To increase exposure of Nicaraguan research publications via Open Access publication and capacity enhancement of key research journals and documents.

As time for this project was limited to 3 years, in order to maximise impact it was agreed to focus on the CNU member institutions. Representing each region of the country, these include:

- Universidad Nacional Agraria (UNA)
- Universidad Nacional Autónoma de Nicaragua (UNAN, Managua)
- Universidad Nacional Autónoma de León (UNAN, León)
- Universidad Centroamericana (UCA)
- Universidad Nacional de Ingeniería (UNI)
- Universidad Católica Agropecuaria del Trópico Seco (UCATSE)
- Universidad de las Regiones Autónomas de la Costa Caribe Nicaragüense (URACCAN)
- Escuela Internacional de Agricultura y Ganadería. Rivas- Nicaragua (EIAG)
- Bluefields Indian & Caribbean University (BICU)

3.1 Objective 1: Access to online research information

To provide access to relevant, high quality international research publications in electronic formats to researchers within Nicaraguan university and public research institutions.	
Assessment on achievement of objective	Satisfactorily achieved. Capacity of staff and adequate infrastructure to sustain services established. Funding mechanism in place to renew subscriptions.

Central to the project, it was considered important to commence with raising awareness of the available resources and selecting potentially relevant databases prior to subscription payment. A trial period was then arranged by PERii with the selected publishers so that training on accessing and evaluating these databases could be undertaken.

3.1.1 Related activities and outcomes

Stakeholders met annually to reach agreement on selection of the subscribed databases. From the first year onwards and as a result of participation in the MEERU workshop, selection has been based on usage data and needs of the user community as well as available budget. Once the selection has been agreed, negotiation with relevant publisher has been efficiently led by PERii and national level agreements put in place between the publisher and CNU. Full details of the selected databases are available from www.peri.net.ni/BasesdeDatos or www.inasp.info/nicaragua. In 2011 the publisher databases available through PERii include:

- Acoustical Society of America
- American Institute of Physics
- American Society of Agricultural & Biological Engineers (ASABE)
- Beech Tree Publishing
- EBSCOHost plus Spanish-language sources
- Edinburgh University
- Geological Society
- Mary Ann Liebert
- NPG - Nature
- NPG - Palgrave Macmillan Journals
- Optical Society of America (OSA)
- Oxford University Press E-journals
- Royal Society
- Royal Society of Chemistry Archive
- Springer Basic Package 1349 titles
- Symposium Journals
- University of Chicago Press
- World Bank WDI, GDF, ADI, GEM



Figure 2 Students in Library computer lab

The following E-books packages were a new addition for 2011:

- GVRL Spanish science collection

- GVRL Spanish computer science collection
- GVRL Spanish educator’s collection
- GVRL Spanish environment collection
- GVRL Hosting fee (annual requirement for access)



Figure 3 PERii Coordination team at UNAN-Leon



Figure 4 Nicaragua Project and PERii Coordinator – Ruth Velia Gomez

Usage of subscribed databases:

The usage statistics for subscribed electronic resources have increased annually over the duration of this project. In 2008 there were 3,123 full-text articles downloaded, by 2009 it was 13,372, and in 2010 the total was 18,910. Whilst preferred databases differ according to the specialism of the institution, national statistics consistently show that EBSCO, Springer Link, ASABE, and Wiley Blackwell are the most popular resources.

For a comprehensive analysis on usage of resources and other project details, please see the excellent bibliometric study by Martha María Aburto Ramírez (Ramírez, 2011)

<http://www.peri.net.ni/pdf/informefinal/InfInglesPERI2011.pdf>.

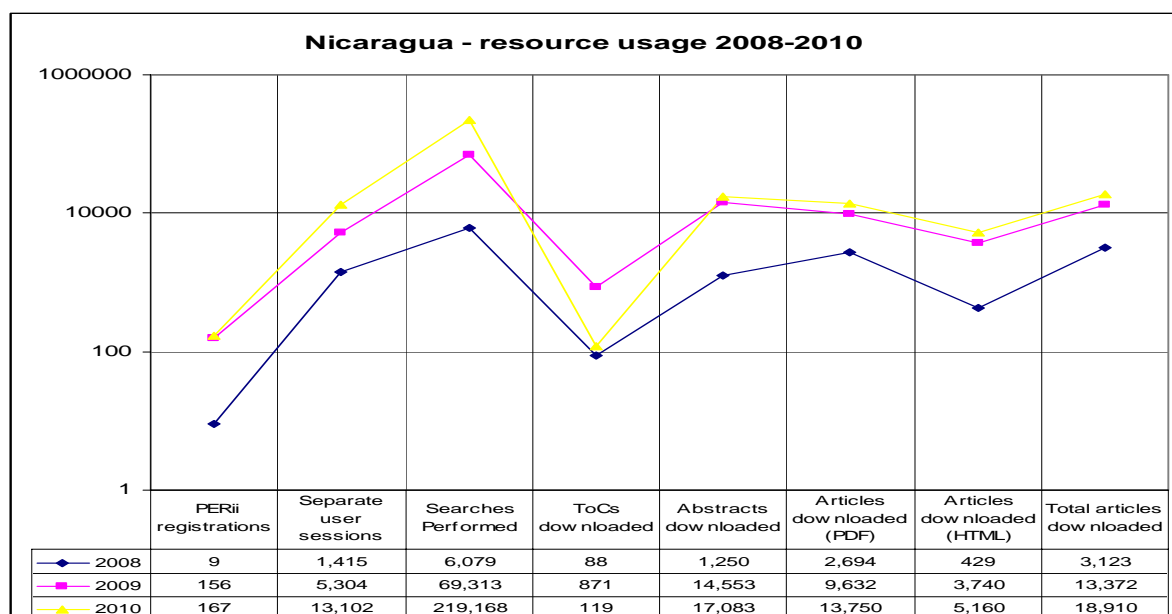


Figure 5 Recorded usage of e-resources (2008-2010) at 31.12.2010

Activities:

A number of activities directly related to this objective were and continue to be presented. These are listed in Table 1 and include the annual stakeholder meetings, development of a library consortium, and attendance at international events.

In addition to consultation on the selection of resources, the project participants have shared their annual operating plans. These are drawn up incorporating the regular activities of the library along with the various steps necessary for successful project implementation at the institutional level.

Date	Event	No.	Researchers	Senior admin/academics	Librarians	ICT tech
Ongoing	E-resource related activities (Access, evaluation, monitoring, promotion, training)					
Annual	Stakeholder meeting		√	√	√	√
Annual	PERii Steering Committee Meeting participation (UK/BD/UK/MW)				√	
Ongoing	Participation in relevant international and regional events e.g. Consortia, Scientometrics. Closely working with Honduras (many co-hosted/shared events), Cuba, Costa Rica, Panama		√	√	√	√
Ongoing	Promotional activities					
2009: Jan	Consortium seminar	36		√		
Feb(annual)	Presentation – University Rectors	10		√		
June	MEERU workshop	23			√	
2010: Sept	Consortium Development workshop	28			√	
2011: March	Information literacy – conference & workshop	20			√	
March	M+E PERii meeting	20			√	
June	MEERU follow on workshop	21			√	√
Sept	Consortium workshop	29		√	√	

Table 1 E-Resource Selection and Planning Activities

The clarity from the outset of the project on the necessity of contribution by each institution and transparency regarding the financial implications has proved effective. **By the end of the project all institutions have made a financial contribution towards the cost of maintaining subscriptions.** This provides a sound basis for the planned library consortium to build upon. As well as inclusion by CNU, some institutions have also been successful in advocating for e-resources to be included in their strategic plan.

3.1.2 Developing a national library consortium

Although the institutions have in part secured institutional budget allocation towards the cost of the subscribed resources, the development of a national library consortium is now seen as key to longer

term sustainability. Such a consortium would support the ongoing provision of the subscribed resources together with a mechanism for planning national library related activities and strategies.

An initial one day seminar was presented in 2009 and followed in 2010 by a 3 day workshop on development of a library consortium. Representatives of 18 institutions participated and topics including purpose, cost sharing models, and appropriate consortium processes given the local context, were discussed and studied. Subsequent discussions have taken place and a follow-up workshop is scheduled for late 2011. In addition the PERii Country Coordinator was an invited panel member on the session focusing on consortia at the 2011 pre-IFLA satellite conference in Guatemala.

Due to the complexity of creating an official body, especially one involving private and public universities in financial commitment and ensuring it fits well with existing university structures, this component is yet to be completed. However indications are positive and library staff spoken with during institutional visits and in feedback collected, stated their commitment and support for the consortium concept. Recognition of the importance of support from senior administration has resulted in sensitization meetings on issues of consortia with the chancellor and academic vice-rector amongst other decision makers.

Data collected during the project has helped in advocating support for the concept. Not only usage data but data on cost effectiveness and user satisfaction with the services provided by the library. Also data showing the popularity of the resources, for instance 92% from sample 153 academic staff indicating maintaining availability of PERii resources as essential to academic development.

3.2 Objective 2: Enhancing library staff capacity

To develop and strengthen the skills and capacities of Nicaraguan university and research library staff in order that they can provide researcher focused digital library services.	
Assessment on achievement of objective	Satisfactorily achieved. Capacity of staff greatly enhanced through the relevant and up to date training provided. Adequate infrastructure to sustain services established. Evidence available to advocate for continuation of project

This objective was seen as central and given precedence from the beginning of the project. Evaluation, access and usage of e-resources was combined with training of trainers and delivered to the core group of institutional librarians. This group, made up of the institutionally identified PERii nominees, formed a close network with each other and with the PERii Nicaragua coordinator. Each institutional team generally consisted of a library director, librarian and an IT professional.

3.2.1 Related activity and outputs:

National level activities aimed at developing a skilled team adept at delivery of the services related to e-resources, commenced at the start of the project in 2008. A summary of the national level events are listed in Table 2.

Date	Event	Female	Male	Researchers	Senior admin /academics	Librarians	ICT tech
2008: May-June	E-resources & Training-trainers	36	16	√		√	√
Sept	E-resources	37	11	√		√	√

Date	Event	Female	Male	Researchers	Senior admin /academics	Librarians	ICT tech
Oct	E-resources	33	7	√			
Oct	E-resources	58	70	√			
2009: Jan	Consortium seminar	22	14		√		
Feb	E-resource training	23	10	√		√	
June	MEERU	15	8			√	
July-Dec	E-resources	9	6	√	√		
2010: Sept	Consortium Development	21	7			√	
2011: March	Information literacy – conference & workshop						
March	M+E PERii meeting						
June	MEERU follow on	17	4			√	√
Sept	Consortium workshop	21	8		√	√	
Annual	Stakeholder meetings			√	√	√	√
Annual	PERii Steering Committee Meeting - UK/BD/UK/MW					√	
Ongoing	Participation in relevant international and regional events e.g. Consortia, Scientometrics. Closely working with Honduras (many co-hosted/shared events), Cuba, Costa Rica, Panama						
Ongoing	Promotional activities						
Ongoing	Institutional events – cascading training with many holding regular scheduled training sessions either on general or specific databases						

Table 2 Library staff training activities

- As part of this project each participating university attending the initial national level training has taken on the responsibility of cascading the e-resource usage and management training to their institutional community.
- A large number of follow on activities have been presented by PERii teams to their institutional colleagues during 2008-2011. **For example in 2010 alone, records show e-resource training was delivered to 4,142 participants.** This figure does not include more informal training or promotional activities.
- These activities have varied in content and duration. Some institutions presented regularly scheduled training sessions focusing on specific databases. Others aimed at developing general searching techniques and awareness of the available resources either on a rotating schedule or when timing in the semester was most appropriate.
- Feedback is collected at the end of the workshop either by completing an online or hard copy of an agreed questionnaire. Input by the local organiser is invited in creating the survey and in analysing the data collected following the event. As part of the process, participants are encouraged to provide honest feedback so that further activities can be improved or identified. To further encourage self-analysis and monitoring, the survey tool “Survey

Monkey” has been used to store evaluation data and create surveys and questionnaires. **Workshop evaluation feedback received has been very positive** with participants appreciative and keen to maximise the opportunities presented. **The follow up impact review has also provided very positive feedback, especially on practical application.**

- Details on additional activities, including participation at relevant national and regional events, are available from the Nicaragua PERii Country Coordinator and listed on the Nicaragua PERii Events web page <http://www.peri.net.ni/>. Also see listings on the CNU website of activities supporting research, for example an annual event promoting the country’s research, held each year at a different location (in Rivas in 2010): http://www.cnu.edu.ni/index.php?option=com_content&view=article&id=209:onceava-expocidencia-y-tecnologia-se-celebrara-en-rivas&catid=1:seccion-de-noticias-del-cnu&Itemid=2

Many of the activities have helped to enhance the existing professional librarian culture in Nicaragua and allowed **development of stronger networks**. Regular communication between the PERii Lead Coordinator and the institutional coordination teams has proved effective and a mutually respectful and supportive relationship has developed. Team building activities and interaction include:

- Needs and plans discussed with problems resolved quickly as they arise, especially important in relation to the management of electronic resources and in matching training to the needs of the librarians and users.
- Regular stakeholder meetings. Selection of subscribed databases is collaboratively agreed and discussion on formation of the library consortium has involved representatives from each institution. Also allowed sharing of annual action plans.
- Training on monitoring and evaluating e-resource access and usage has allowed evidence based selection of resources and provided useful data at an institutional and national level.
- Training attended by representatives from the member institutions allowing not only sharing of the skills but also closer working relationships between participants. For instance this networking has supported the steps taken in the creation of the consortium which necessitates close working relationship and agreement on common goals.
- Participation in international and regional library focused activities has increased awareness and provided learning opportunities and an extended network of professional contacts.

Whilst early to establish lasting impact, the indication, based on observation and feedback, suggests that this interaction is set to continue. Not only because of components for completion such as formation of a library consortium, but because relationships have been strengthened and there is a sense of pride in what has been achieved together as part of a network and how this in turn has enhanced their own institution.

3.2.2 Other activities

As illustrated in Fig.3 a variety of activities were undertaken aimed at raising awareness. **The most effective promotional method in raising awareness is shown as training and/or through the librarian or teaching staff. Web pages and posters also featured strongly.**

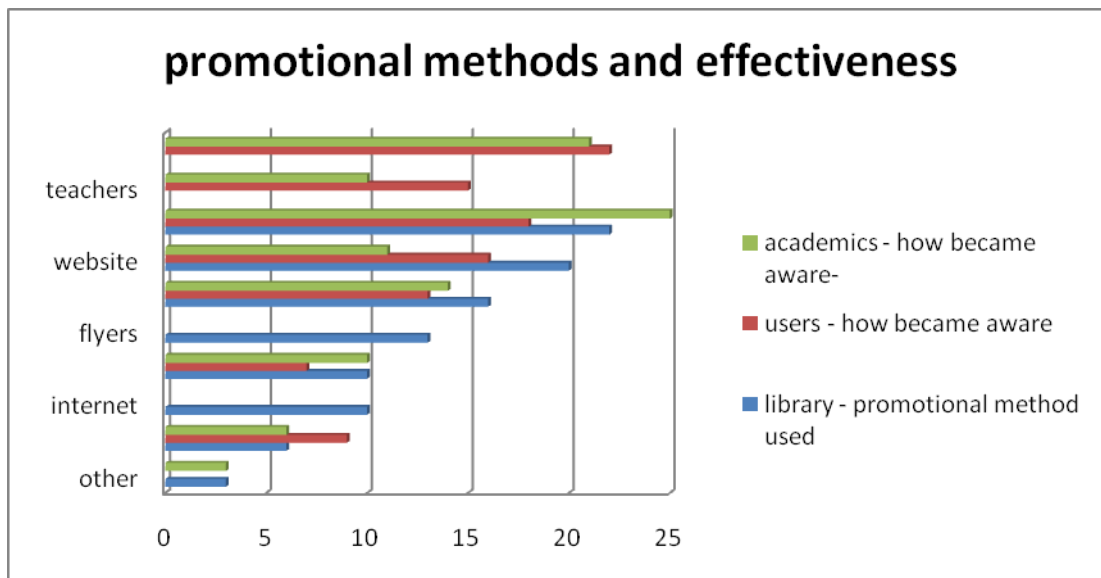


Figure 6 Promotional methods and effectiveness

In addition to those led by the project coordinator, each institution adopted their own promotional strategy. **All participating institutions created a web presence to facilitate visibility and easy access to the available PERii databases.** For some this involved creating a web page from scratch whilst for others adding a page to their existing library site was all that was required. Fig 4, 5, 6, 7 illustrate how CNU present databases for the project overall and how one of the participating institutions BICU and the agricultural portal CENIDA present databases for their users. Each team has taken ownership and pride in developing their individual institutional web page listing the available PERii resources.



Figure 7 PERii publisher databases on CNU web page

<http://www.peri.net.ni/BasesdeDatos/index.html> <http://www.peri.net.ni/BasesdeDatos/index.html>

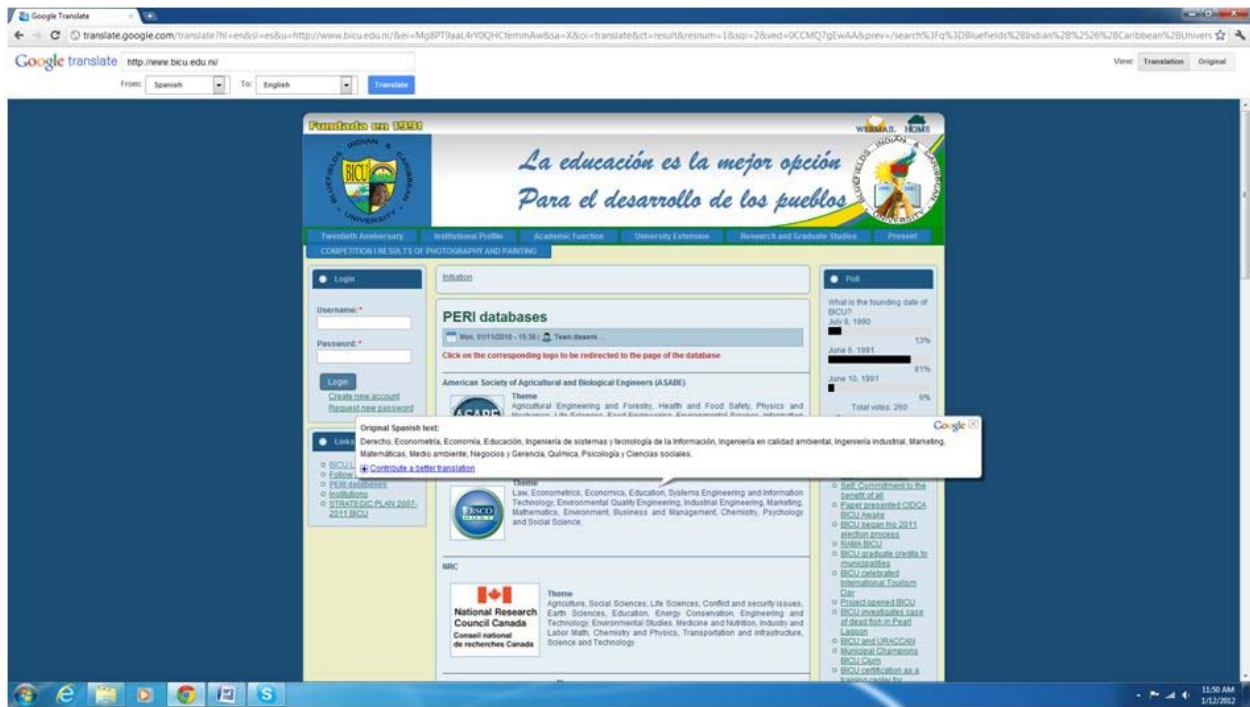


Figure 8 PERii publisher databases on BICU web page

<http://cenida.una.edu.ni/index.html>



Figure 9 Online catalogue on CENIDA web page

<http://cenida.una.edu.ni/bPERii.html>



Figure 10 PERii publisher databases on CENIDA web page



Figure 11 Librarians promoting training

3.2.3 Sample of project feedback on the activities

Selection of quotes from library directors and staff when questioned on impact of project as part of the 2011 bibliometric review.

"Today PERii is a nationally recognized project as source of information built by universities"

"The main impact in academia has been the incorporation of the Module on Resource Use and Handling of Electronic Information in two Masters programs and the induction lectures offered to freshmen."

"The PERii project has impacted the creation, processing, transmission and diffusion of knowledge as well as other traditional functions of universities to research, teach and to disseminate new knowledge."

"PERii initiated a dialog for exchange of information and improved collaboration between institutions of higher education by promoting the development of quality and the effectiveness of University Libraries."

"It has had a good impact - breakthrough on research conducted by students using PERII resources, impact on the quality of the certified information, effective information management."

".. much resistance to change but little by little the culture has changed."

"... it allowed the creation of a working environment for academics, librarians and researchers, and editors could reach points of reference, understanding and common ground."

"The impact on the development of academic programs, this updated electronic information resources, timely, pertinent and quality are in some measure the input for the construction of new learning environments and educational innovation."

“The researchers are using more reliable sources, hence their final products are of higher quality.”
(Ramírez, 2011)

The above feedback is generally reflective of how the library staff and users view the achievements of this project. They feel competent in accessing or evaluating the available databases and satisfied with the information available and the facilities, including connectivity speeds. **The increased confidence in using and evaluating the resources, plus for some in sharing this learning, is a very clear and positive outcome.** Respondents also commented on the positive development of the infrastructure and availability of resources. As noted in Section 4.3 on barriers and limitations, work remains to be done but the foundation to build on has been established.

3.3 Objective 3: Strengthening ICT library services

To strengthen ICTs used to support access to research information within targeted institutions.	
Assessment on achievement of objective	Satisfactorily achieved. Infrastructural development enhancing library ICT environment. Positive indication of sustainability with transfer of acquired skills between colleagues and through locally facilitated national training.

Whilst this objective was assigned a two year period for completion, it was seen as an essential component in the development of the project and therefore accorded prominence for activities during 2009.

3.3.1 Related activity and outputs:

Activities included an initial review and report on the status of existing networks <http://www.inasp.info/media/www/documents/BMO-Consultation-Nicaragua-02-2009.pdf>, an introductory technical workshop on bandwidth and networks, a policy briefing, a Linux workshop and bandwidth management optimisation (BMO) workshops at basic, intermediate and advanced level.

Date	Event	Female	Male	Researchers	Senior admin /academics	Librarians	ICT tech
2009							
Feb	Bandwidth and Network Evaluation study					√	√
Feb	Bandwidth introductory workshop	2	21				√
June	Bandwidth briefing	8	34		√	√	√
Aug	Bandwidth training (basic)	2	14				√
Sept	Bandwidth training (advanced)	2	18				√
2010							
March	Bandwidth training (advanced)	3	14				√
2011							
May	LAN - Network Technical training	4	14				√

Table 3 ICT activities (2008-2011)

Training activities listed in Table 5, have **enhanced skills of the ICT staff and allowed more effective management of bandwidth and networks.** Some institutions have also been successful in obtaining increased bandwidth for the library, with one medical library recording expansion from 12 to 45Mb. Along with increased bandwidth, 90% of the libraries provide wireless

network and have benefitted from the increased number of computers and enhanced library facilities provided as part of this project.

The PERii institutional teams have an IT specialist who has contributed to implementation, learning or sharing new skills in the process. The creation of new web pages to share the resources, attention to bandwidth issues and enabling use of relevant software have all contributed to the overall successful delivery of the electronic resources. For instance the enhanced networks have enabled quicker access. Provision of the language translator software has helped to minimize one of the barriers identified in accessing predominantly English online resources

3.3.2 Sample of ICT staff feedback:

The following is reflective of the feedback received from ICT staff when asked about the impact of the training as part of the bibliometric study:

“It was excellent because after the PERii training, we have implemented some changes in the structure that allows us to improve the bandwidth and explain to our authorities based on the need to implement some changes and most importantly create usage policies.”

“I do not consider that there are improvements to the bandwidth”

“We have provided new tools for management and administration in a manner that ensures an improved information service.”

“.. adopting the tools and knowledge that we have been given, logically applying to our institutional reality we have thus provide an easier access for users.”

(Ramírez, 2011)

3.4 Objective 4 & 5: Strengthening Nicaraguan research publication systems and processes

For reporting purposes objectives 4 and 5 have been combined as there has been significant overlap in achievement of both these objectives.

Objective 4: To strengthen the national research output publication mechanisms of journals and online publications systems
Objective 5: To increase exposure of Nicaraguan research publications via Open Access publication and capacity enhancement of key research journals and documents.
Assessment on achievement of objective
Satisfactorily achieved identified publishing related objectives. Ongoing work required to foster development of research.



Figure 12 Participants of the 2011 LAMJOL workshop:



Publishing and the area of research output and systems have seen a number of developments since this project was initially planned. Some of these developments have directly involved INASP, for example the positive and rapid progress of the INASP Journals On Line (JOL) programme as well as the AuthorAID project. With this and other current developments in mind, combined with the low number of existing journals in Nicaragua, the most appropriate option was agreed to be through creation of a combined Honduras and Nicaragua JOL. Similar to other successfully created JOLs in

Africa and Asia, it was set up using the Open Journal System (OJS) and with the title indicating region “LAMJOL” (Latin American Journals Online, <http://www.lamjol.info/>). The initial target countries of Nicaragua and Honduras could be expanded should other countries in the region later join.

The associated planning and activities commenced virtually in late 2009, followed by the first face-to-face training presented to participants from Honduras and Nicaragua, hosted in Managua in 2010. A country specific follow up workshop was presented in the first half of 2011. As well as providing a platform for online publishing, it aimed to cultivate a wider interest in local research output and foster improvements in the quality of publications. It is anticipated that this will lead to inclusion in other regional and international databases such as Latindex and Scopus.

Through communications within the Latin American PERii network, and in an effort to increase the number of indexed Nicaraguan publications and their visibility, Nicaragua agreed to host the Latindex conference in 2010. This helped to significantly widen the network of contacts in the publishing field and has led to follow on activities and participation in regional events.

The regional AuthorAID (www.authoraid.info) workshop was hosted in Managua in 2008. This mentoring project provided an opportunity for fifteen nominated participants from Nicaragua to have practical experience of improving a research paper they were currently working on and guidance on publication. Three academics from CNU were sponsored to attend the one week AuthorAID workshop on Research Writing held in Colombia in 2009. Since then locally hosted writing skills workshops have been presented within institutions and faculties or incorporated into the student course work.

3.4.1 Related activity and outputs:

Details of workshops and activities supporting publication and dissemination of research are listed in Table 3.

Date	Event	Female	Male	Researchers	Senior admin /academics	Librarians	ICT tech
2008	Regional AuthorAID workshop	7	8	√		√	
2010							
Jan	Planning on Journals on Line Project						
March	AuthorAID	15	21	√			
Oct	Journals on Line workshop	4	9	√	√		
Oct	Latindex workshop	7	7				
2011							
Feb	Scientific Writing	14	14	√			
May	Journals on Line workshop	11	13	√	√	√	√
June	Latindex Panama	1				√	
Ongoing	Participation in relevant external events eg. Latindex or in co-hosted/shared eg. Honduras, Cuba, Costa Rica, Panama and Latindex						

Table 4 Publishing activities (2008-2011)

Activities were primarily implemented from 2010 onwards and full impact will take time to materialize. The observable outcomes to date include:

- The creation of LAMJOL has provided a platform making Nicaraguan and Honduran journals available online <http://www.lamjol.info/>. At time of review, 5 Nicaraguan journals are participating in and meeting requirements for inclusion in LAMJOL.
- In order to continue building capacity amongst national editors on the use of the software of the LAMJOL platform (OJS), a training journal has been made available on the platform.
- Follow on workshops and promotional activities already planned aimed at increasing number and quality of journals participating in LAMJOL and providing guidance on running, preparation and publication of a journal. Records show 162 participants in related activities.
- As a direct result of online access, there has been increased recognition of the journals and associated positive impact on the editor and journal contributors.
- Participation and hosting in Managua of an AuthorAID writing skills workshop and attendance by 3 CNU academics proved very beneficial. Subsequently similar training has been presented by some of the faculties, or components included in the course work for research students. Trained 364 academics and researchers on the use and management of information resources, and science writing.
- Twenty five journals have been included in the Latindex Directory <http://www.latindex.org>, and referenced on other web sites e.g. <http://www.unesco.org/new/en/communication-and-information/portals-and-platforms/goap/access-by-region/latin-america-and-the-caribbean/nicaragua/>
- Number of users visiting LAMJOL site (Fig 14) up from the initial monthly figure of 6 in August 2010 to 1,931 by June 2011.
- LAMJOL workshop participants indicated how useful this project was, identifying significant changes it had enabled with many noting how it had increased and accelerated sharing their journal.

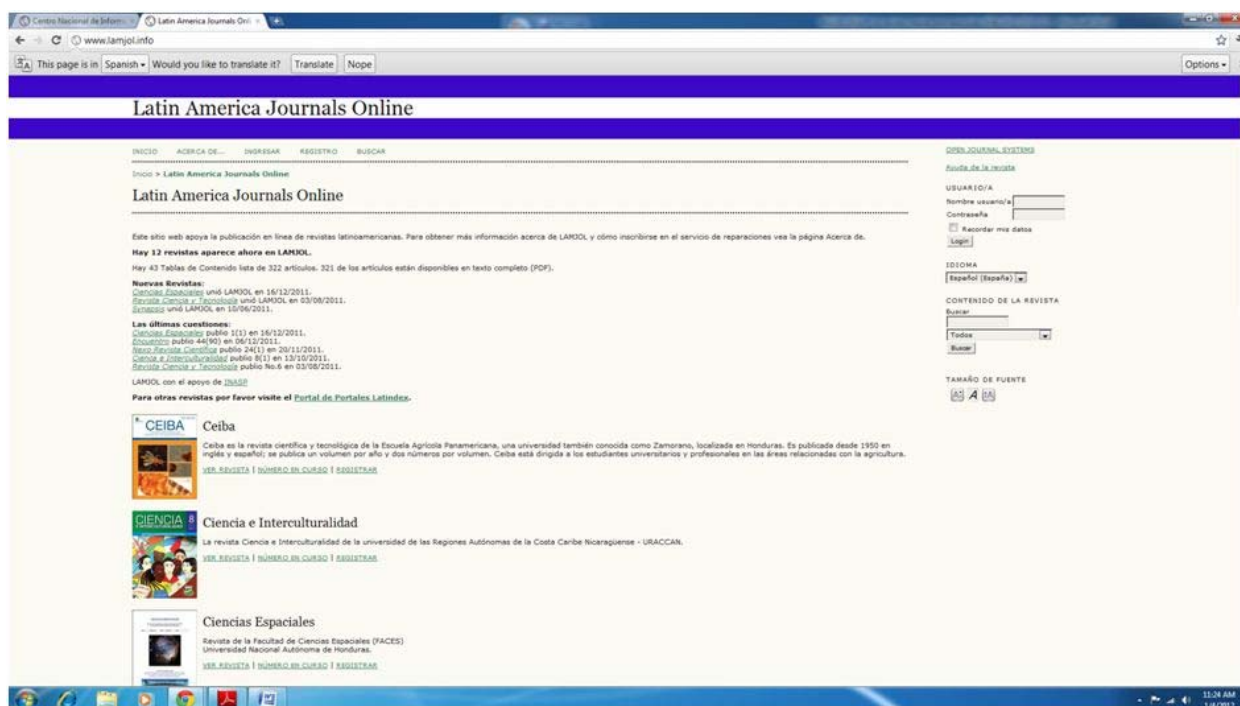


Figure 13 LAMJOL Homepage

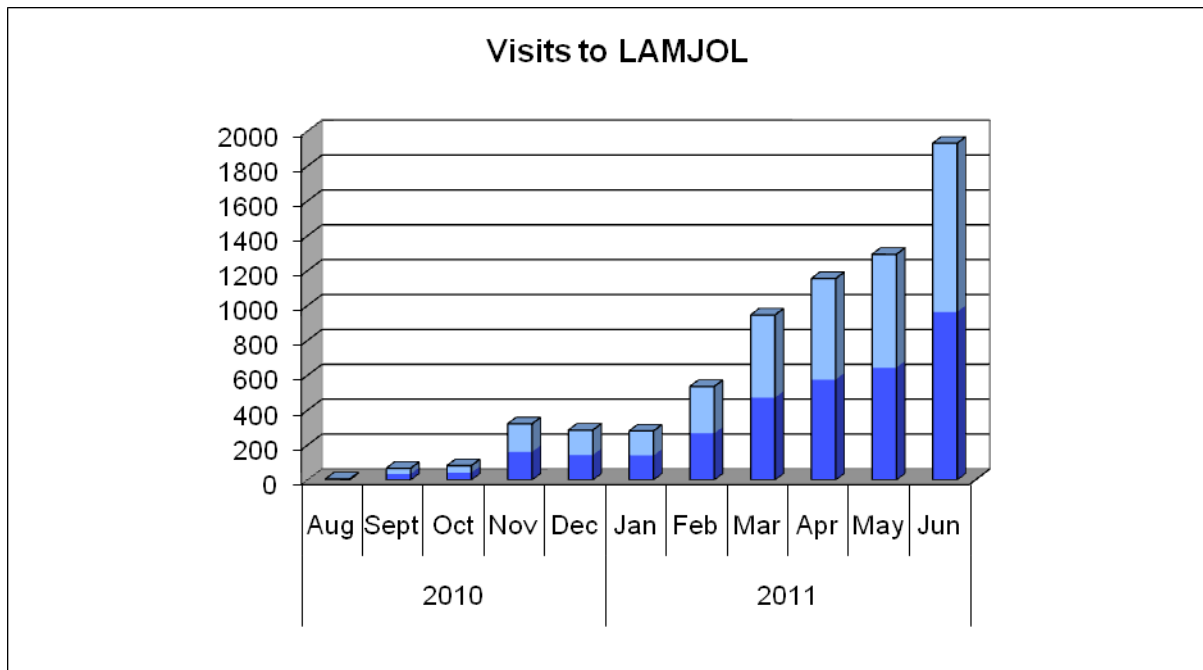


Figure 14 Visits to LAMJOL (2010-2011)

3.4.2 Bibliometric Data Analysis

Similar to other data sets, current internationally recognized Scopus bibliometric data records very low research production from Nicaragua. The trend during the time of the project is upward for number of published articles but static or decreasing as a comparable % of the region’s output. Medicine, at 30% (2010) and agriculture at 18% (2010) have consistently been the disciplines showing the greatest concentration of output. Although citations do not appear in bibliometric data until a few years after article publication, this figure is included here as a base reference for future studies. Data in Table 4 covering 2008-2010 contains only output meeting the Database’s prescribed criteria and not the total output of Nicaraguan research.

Year	Documents	Citable Documents	Cites	% International Collaboration	% Region
2008	80	78	595	88,75	0,11
2009	85	81	334	95,29	0,11
2010	84	83	112	92,86	0,10

Table 5 Nicaragua research output- SCImago Journal & Country Rank.

In addition to the bibliometric study of database usage by Ramírez, a Cuban bibliometric research report by Ricardo Arencibia-Jorge, on internationally published output of the 5 PERii Latin American countries, is available in either English or Spanish via Open Access at: www.inasp.info/bibliometrics .

3.4.3 Sample of Journal Editor feedback:

Following participation in the first JOL workshop: [I will..]
“Completely rethink many aspects of the electronic edition of the journal, share knowledge with other members of the editorial team”

*"Substantially improve many areas .. that until now were nonexistent or weak."
"...now can update publications." "Gave me the knowledge to publish the journal online."*

4. Capacity and Development of Infrastructure

4.1 Capacity

Capacity development has featured very strongly across all project components and omens well for longer term sustainability. The Coordinator has worked diligently on the provision of end user training; either arranging for participation in externally facilitated activities, national and international, or in providing guidance or facilitating locally led training activities. Details of these are included along with the appropriate objective under Section 3. In addition there were a number of conferences and international events attended or organized by representatives from Nicaragua. Not included are the many follow on and associated training activities organized and implemented by each of the participating institutions. As noted under Section 3.2 over 4,000 people were trained in 2010 alone; and this number based only on recorded training sessions so not including the many informal sessions or events taking place. There remains work to be undertaken as noted in Fig.17 and capacity development will require ongoing work but the capacity is in place to do so. Although allowance has not been made for the same person attending more than one event, 1,040 have participated in national led activities and approximately 10,000 have attended institutional training sessions.

Participation in international activities has resulted in not only raising awareness of issues related to supporting research but also in developing strong links and participation in networks. For instance the close links formed by Nicaragua with Cuba have allowed sharing of expert facilitators from an established PERii country; or with Honduras the sharing of many opportunities including collaborative training.

Sample response describing a library approach to provision of e-resources training:

"We currently provide training on the use of databases for teachers on their desktop, for the students on the library PCs or their own laptops in the library, as well as the reintegration of APA references in Word documents."



Figure 15 Sample of hands on workshop activities

4.2 Infrastructure

This section provides details on the IT development and improvement carried out as part of this three year project. This enhancement of the infrastructure allowed delivery of identified components and achievement of objectives, resulting in improved services for the academic community. This component was integral to the success of the overall project especially for those libraries that had a very limited existing infrastructure in the library.

Equipment provided through project (64 computers/11 servers/misc items)	Institution
5 computers, 1 server, 1 cable box, 1 switch, 50 connectors, 1 wireless	EIAG RIVAS
9 computers, 4 servers, 4 batteries and bandwidth enhancement	URACCAN
5 computers, 2 servers, 2 wireless router, 15 network cards and wireless antennas, 2 media converter, 2 switch, 10 fiber optic connectors, 8 convectors patch, 50 connectors, 1 cable box	BICU
5 computers, 1 server	UNAN-Managua
12 computers	UNAN-Leon
9 computers, 1 server	UNA
9 computers	UNI
5 computers, 1 server	UCATSE
5 computers, 1 server	UCA
Library facilities improved through restructuring, provision of furniture or cosmetic enhancement.	

Table 6 Infrastructure development

4.3 Barriers and Limitations

Whilst the story overall is positive, there are areas for improvement. When librarian and academic staff were asked specifically about what were the barriers or limitations in using e-resources as part of the bibliometric review, a number of issues emerged. Apart from lack of training and awareness, the 2 groups noted different issues. Interestingly infrastructure, often assumed as a major barrier, was noted as a problem by librarians only.

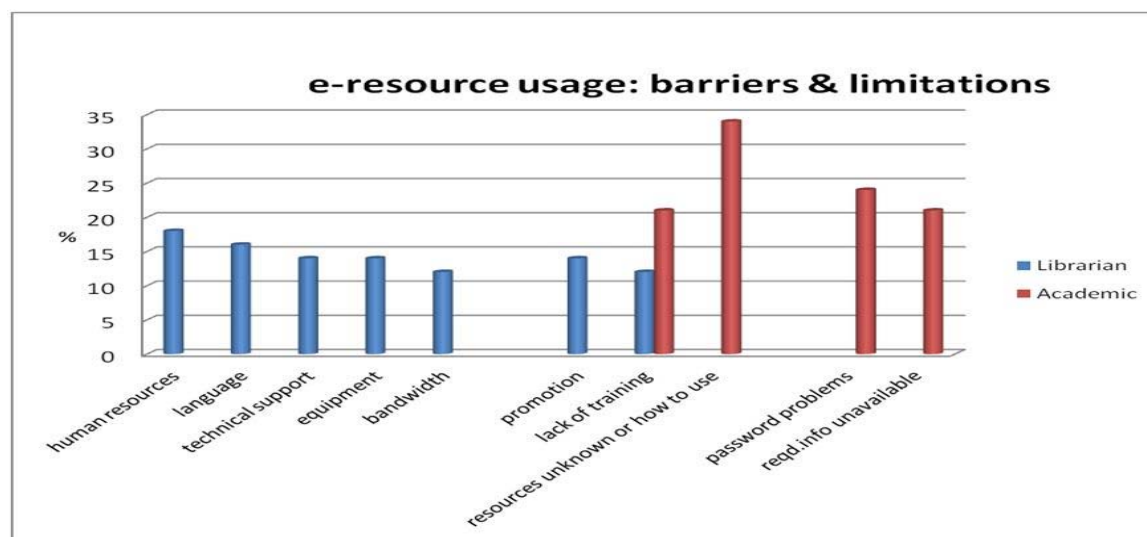


Figure 16 Barriers to usage of e-resources

Source of data (Ramírez, 2011)

5. Project coordination and financial management

5.1 Coordination:

The strong direction provided by Ruth Velia Gomez, in her role as Country Coordinator and the excellent relationships developed with and between the institutional coordinating teams have all contributed to the implementation of the planned activities. Close communication between the PERii Nicaragua coordinator and INASP coordinator through regular email and Skype meetings together with annual personal meetings ensured that any uncertainty was clarified in a timely manner, problems resolved and opportunities maximized. Along with financial support, the Sida contact person provided advice and guidance. Annual project reports allowed for regular reflection as well as establishing the progress or omissions during the reporting period covered.

Commitment of the Country Coordinator was central to the successful implementation of this project. Snra Velia Gomez worked tirelessly to achieve the project objectives. Along with the relationships she formed with team members, she constantly looked for and found ways to involve a diverse group of stakeholders including senior administration and senior research staff. She also followed up on opportunities to capitalize on expertise at a national, regional or international level. These relationships have fostered new networks which are set to continue, for example through involvement with Latindex and the increased exposure of Nicaraguan research which this has facilitated.

There were many activities aimed at promoting the project. Along with the high quality materials, of note was the coverage in the media (TV, radio, newspaper) as well as through a dedicated website www.peri.net.ni , institutional websites and various blogs. Attendance at national events such as the Congress of Innovation for Rural Development or the National Fair for Universities also served to increase awareness.

8.1 Synthesis chronology of development Program PERii 2008-2011.

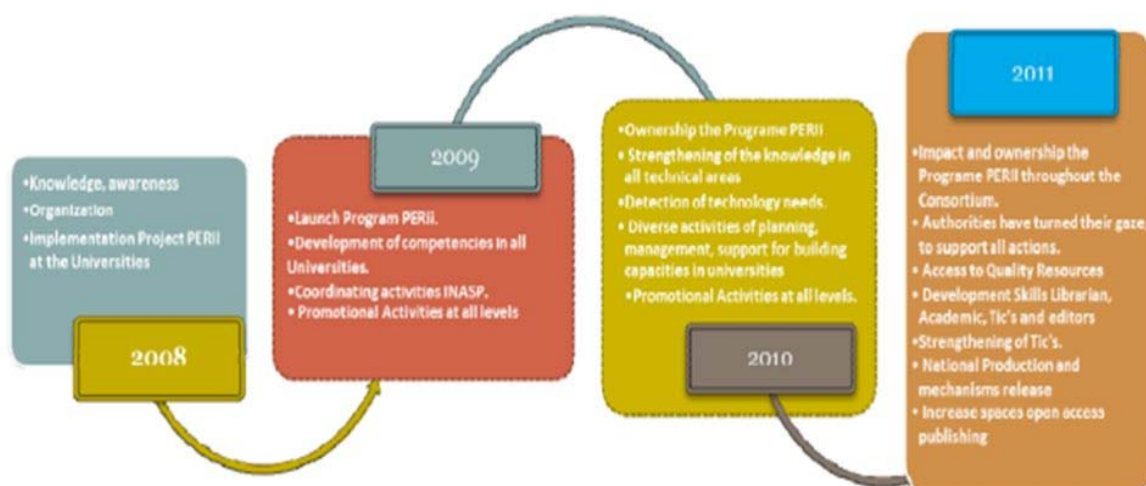


Figure 17 Chronology of Project development (2008-2011)

(Ramírez, 2011)

5.2 Finance

Overall the financial element went to plan with funds transferred efficiently and according to budget. Having the host country control dispersion of funds is recommended unless justifiable reasons not to.

In the event of other projects dependent on availability of resources, it is important for funds to be made available from the outset as publishers require payment for subscriptions up front.

6. Implementation partners – self review, key learning and change enabled

As noted under coordination above, this was a successful partnership which has resulted in the implementation of the planned activities. During the project, regular time has been devoted to reflection which has helped assess progress and achievements or failings. To continue this learning, the review sought to identify change this project has contributed to, along with key learning to help inform further similar activities.

In an effort to establish what lessons can be learned, a separate document has been prepared containing recommendations based on combining the overall findings from this project in Nicaragua with a similar project in Honduras. Both projects had the same overall aims, similar partner and hosting structure and took place over the same time period.

6.1 Partners: main role and the partnership experience

Sida: The financial support of Sida allowed the project to become a reality. The combined experience of working internationally and in the region, helped Sida in identifying not only a need but also a practical and context appropriate project. A supportive attitude and guidance was provided throughout the project duration.

PERii: Sharing experience, starting with involvement at the planning stages through to completion of each of the project components. PERii supported implementation of activities, shared review and reporting, and explored with partners solutions as challenges encountered and helped to identify appropriate opportunities.

CNU: The senior administration in approving and supporting project implementation, and UNA in initiating and hosting the project. Provision of coordination and administration of funds was undertaken by CNU and payment of the e-resources subscriptions. The nominated Coordinator proved to be capable of implementing the project components and obtaining support of the participating institutions from across a range of stakeholder groups.

Working together as partners:

Discussion and analysis on how the partnerships worked was very positive as indicated in the following summarized responses from both CNU and INASP:

- CNU noted that the partners in this project (Sida, INASP, CNU) were key to development, the financial support from Sida was very important, the relationship of INASP with CNU as coordinator of PERii has been excellent, a relationship of respect and a lot of commitment and support. CNU particularly referred to the respectful nature of the work between INASP and CNU and the excellent monitoring by INASP during the project. The INASP staff were all efficient and collaborative especially INASP's direct link for project coordination. The PERii Program coordination and administration of funds by the National Council of Universities CNU was transparent and efficient, which contributed to implementation of the planned activities. The support of the President and Technical Secretary of CNU was invaluable. The Country Coordinator deemed the partnership "a good experience".
- INASP noted that this partnership worked well and that involvement from the beginning was beneficial not only to the design and implementation of the project, but also in developing a

stronger relationship and understanding. The commitment, positive approach and professionalism of each partner were conducive to a genial and productive working relationship. Having a clear plan and defined role to work with kept everybody on track and avoided any ambiguity which sometimes can arise in partnerships. Involved role of PERii and personal meetings with Coordinator, facilitated a shared and more in-depth appreciation of the local situation and the decisions made.

6.2 Key Learning

This project has the potential to impart many lessons. Along with quality resources, timing and scheduling, a clear plan and commitment of the people were central.

Lessons Learned:

- Involvement of **all partners from planning stage** onwards allowing knowledge on what the project entailed and an impetus to achieve the agreed goals.
- Clear **project plan** for a finite period to aid direction and with agreed funding.
- Adoption of **holistic** rather than fragmented approach; recognition of importance of library increased with development of facilities/availability of resources combined with the knowledge of staff
- **Dedicated project coordinator** has led to strong working relationships between the countries and partners. Communication has been frequent and has helped in the development of these relationships. (Choosing the right person/people for the role has been key to success).
- Involvement in the **PERii network** exposed Nicaragua to an international environment where they could learn and share knowledge and build networks.
- Development of **capacity** and confidence of the library and research community through activities.
- **Institutional teams** with librarian and IT skills provided a supportive environment and allowed not only wider reach institutionally, but attendance by at least one member at national level activities and training.
- 'Fit' between the activities contained in the project plans and those within PERii have meant that systems already in place can be utilized. Projects which have **activities which overlap** with those in PERii has meant that the research community in Nicaragua can benefit from the knowledge and experience of the wider INASP and PERii , especially the other PERii Latin American countries.
- **Choice of hosting institution/organization** with a respected and recognized authority to lead the project ensured activities had as wide a reach as possible.

Key drawbacks or problem areas of the approach

- Sustainability issues - **limited time** for spending large amount has potential to not succeed in long term. Time allowance for some activities was too short.
- Although institutional teams, vulnerability of dependence on **one lead coordinator**.

Suggestions based on experience if similar projects in future

- **Project plan** is crucial to the success/failure
 - Realistic start up time to be allowed for project development and implementation start date. Delay can result in loss of momentum or in initial people involved no longer available. Bureaucratic channels and the required level of authority to be considerations.

- As technology advancement is rapid, changes in what can/should be done to achieve objective to be flexible.
- Whenever possible to have feedback on details of plan from the relevant experts before agreement on final plan is reached.
- **Publisher communication** - Improve communication with publishers and ensure that they provide information on usage statistics and database management at the institutional level, a key element to effective database selection.
- **Budget**
 - Clarity from the beginning on the financial requirements, especially confirmation of account details and authorization so as to avoid unnecessary delays.
 - Contingency included to allow for currency exchange variations OR all funds in US\$ only.
 - Funds to be held and accounted for by recipient country unless justifiable concerns.
 - Adherence to scheduled payment. To avoid potential problem, funds for journal subscriptions to be received at the beginning of year so available to make the mandatory advance payment to publishers.
 - Staggered amount for subscriptions so commencing with less funds and less databases and increasing as project progresses.
- **People**
 - Choosing or ensuring involvement/support of the right people for the particular project - to work, support or advocate in country and with funders.
 - Ideally involvement of the project coordinators from the start (when developing the project proposal) but if not then clear plan of responsibilities
 - Implementing partner to have access to the mix of skills required for management of the project.
 - As based on cascading methodology the initial trainers in series are very important as are the nominees chosen to carry on the training
 - Despite evident benefits, some stakeholder groups can be resistant to a project or elements of a project. The key is to anticipate this and look for ways to engage these groups in order to maximise results.

6.3 Change enabled

The project objectives have been implemented within budget and to an acceptable standard. Changes enabled as a result of this project include:

- national access to and usage of a broad range of high quality databases
- skills and confidence of library staff enhanced
- infrastructure developed within the library facilities
- creation of new or stronger networks between and within stakeholder groups and individuals
- behavior of researchers and research activities at an institutional level
- increased chance of success in producing and publishing research
 - creation of online facility for sharing local research and knowledge (LAMJOL)
 - writing skills training
 - heightened awareness of criteria specification requirements for inclusion in journals and datasets
 - knowledge of opportunities for publishing of research
 - access to wide range of resources
- increasing awareness of the importance of research and the value of access to online resources by administration, staff and students as well as researchers

- skills and, based on project achievements, the evidence available to advocate for support to continue and expand on the work of this project plus lead on new projects

7. Conclusions

Based on the data collected during and at the end of the 3 years as well as observation at the beginning, the positive impact and change which this project has contributed is clearly evident. Along with the commitment and direction of the Project Coordinator, a number of factors can be attributed to this success. Significant has been the development of adequate infrastructure and staff capacity at the same time as providing access and raising awareness of the wide range of available high quality online databases. The introduction of PERii teams in each institution has worked extremely well, as has the regularly scheduled training sessions provided by many of the libraries.

The overall consensus is very positive and there is a real sense of pride in what has been achieved. Whilst there is still work remaining, with feedback requesting more training or different resources for instance, feedback from participating institutions praised the project, confirming their capacity and commitment to continue building on what they have achieved. The usage of the databases with downloads up from 3,123 in 2008 to 18,910 by 2010 is set to continue increasing in 2011. The creation of LAMJOL and promotion of local research, show monthly visits increasing from 281 to 1,931 between January and June 2011. Many activities have taken place during these 3 years enhancing capacity. Over 1,000 attended national level events and more than 10,000 participated in institutional training events. E-resource training has become part of the regular schedule of activities undertaken by the library. Budget allocation towards the cost of retaining availability of high quality databases has been put in place; and even for some incorporated into the strategic plan of their institution as well as in the CNU strategic plan. Enhanced interaction between the library community and other stakeholder groups allows a space for mutual sharing and discussion. The heightened visibility of the library services and the enhanced ability to advocate for recognition from the university community and authorities has already proved effective.

In conclusion this project has achieved what it set out to do. Access to information, production and diffusion of research in higher education in Nicaragua and the capacities of librarians, ICT personnel, editors, researchers and users of information have been greatly enhanced. Stronger links and networks have been established not only within Nicaragua but also regionally and internationally. Important lessons have been learned and could prove very useful in setting up similar projects in the future. Involving Nicaraguan partners in a mentoring or advisory role could also be beneficial. Currently indications for sustainability are overall very positive. However the level of impact this project contributes to research in Nicaragua can only fully be established when more time has elapsed. A follow up review is therefore recommended between 3 to 5 years from now.

8. Bibliography

Ramírez, M. M. (2011). *Bibliometric Study of the Use of Online Databases PERii Program during 2010 and PERii impact assessment in the three years of operation 2008-2011*. Managua: CNU.

<http://www.peri.net.ni/pdf/informefinal/InfInglesPERI2011.pdf>