Evaluation of Finnish Rural Sector Development Cooperation in Nicaragua

Final Report

Final Evaluation of Nicaragua-Finland Agro-biotechnology Programme NIFAPRO

Maaria Seppänen

With the collaboration of:

Lars Eriksson
Benicia Aguilar
Kristina Boman
Thomas Pijnenburg

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ABBREVIATIONS

BA	Bachelor of Arts
BSc	Bachelor of Sciences
CNIA(B)	Centro Nacional de Investigación Agropecuario (y Biotecnología)
DGPSA	Dirección General de Protección y Sanidad Agropecuaria (in MAGFOR)
ECTS	European Credit Transfer System
EU	European Union
FAO	(United Nations) Food and Agriculture Organisation
FOMEVIDAS	Fomento de Medios de Vida Sostenibles (later rebaptised Programa de Fortalecimiento al Desarrollo Rural y Reducción de la Pobreza en Boaco y Chontales)
FSLN	Frente Sandinista de Liberación Nacional
GMO	Genetically modified organisms
IADB	Inter-American Development Bank
ICI	Institutional Cooperation Instrument
HEI-ICI	Instrument for Institutional Cooperation between Institutions of Higher Education
HU	Helsinki University
INTA	Instituto Nicaragüense de Tecnología Agropecuaria
MAGFOR	Ministerio Agropecuario y Forestal
MIFIC	Ministerio de Fomento, Industria y Comercio
MOU	Memorandum of Understanding
MINREX	Ministerio de Relaciones Exteriores
MA	Master of Arts
MSc	Master of Sciences
NIFAPRO	Nicaragua-Finland Agro-biotechnology Programme
PIDR	Programa Integral de Desarrollo Rural (1st phase of PRODEGA)
PRODEGA	Programa de Desarrollo de la Ganadería
PROPEMCE	Enhancing Small Enterprise Growth of Nicaragua through the Development of Existing Value Chains
PRORURAL	Programa Sectorial de Desarrollo Rural Productivo
SICA	Sistema de Integración Centroamericana
SICTA	Sistema de Integración Centroamericana de Tecnologías Agrarias
Sida	Swedish International Development Agency
TOEFL	Test of English as Foreign Language
TOR	Terms of Reference
UH	University of Helsinki
UNA	Universidad Nacional Agraria
WB	World Bank

1 EXECUTIVE SUMMARY

The final evaluation report on the Nicaragua-Finland Agro-biotechnology Programme (NIFAPRO) is based on interviews with stakeholders and persons involved in the project implementation in Helsinki; on fieldwork in Managua, including review of documents provided by the Embassy of Finland and; on interviews with authorities, persons involved in the project and the NIFAPRO (ex) students. For an evaluation of a project that ended only a couple of months ago, it is impossible to assess an impact. Therefore the most important issues stressed in the evaluation were effectiveness, efficiency, ownership, sustainability and Finnish added value.

NIFAPRO, carried out jointly by the University of Helsinki and INTA, the Nicaraguan Institute of Agrarian Technology, was designed in 2006 as a complementary input to support the other rural sector interventions or sector budget support programmes funded by Finland and other donors. The background of the Programme was the need of trained personnel and public policies to take advantage of new biotechnological innovations and regulate their use, in order to have seeds of better quality, improved control of pests and diseases, enhanced breeding of superior varieties using molecular markers, and the use and preservation of untapped genetic resources. The overall objective of NIFAPRO was to develop Nicaraguan national capacities in agro-biotechnology and bio-security, and to contribute to the formulation of a national agro-biotechnology policy. The purpose was to improve technical staff's capacities in plant variety improvement, and to formulate a national policy of biotechnology adapted to Nicaraguan circumstances. The main activity of the project was to train ten Nicaraguan young university degree holders in a Master's degree programme at the University of Helsinki in plant production science after which INTA committed to give employment to them at the National Agricultural Research Centre CNIAB, equipped by a World Bank project. In addition the project organised two scientific congresses on agricultural biotechnologies.

The students were selected in three batches (4+3+3) the last of which graduated only in December 2012. The selected candidates were trained in English proficiency in intensive courses before departure for Finland, and the students had to commit to the programme and work at INTA for twice the time of their studies after graduation. The evaluation report dwells at some length on the experiences of the students in Finland. Particularly the main difficulty encountered, the different pedagogical system as compared to what had been experienced by the students in Nicaragua, is analysed in detail. All students graduated with at least average notes, and two of them have been selected for a PhD degree programme at the University of Helsinki.

The evaluation findings can been summarised as follows:

The project has been effective to 80%. Only two of the NIFAPRO graduates have left the programme, six of them are working at the CNIA laboratory and two were waiting for their contracts with INTA at the time of the evaluation but have since signed their contracts with INTA. The output (degrees) has been 100% of what was planned as all students graduated. The project did not achieve its objective of formulating a national strategy in biotechnologies but greatly contributed to national debate on the topic, mainly through the organisation of international scientific congresses. The modality of a project proved to increase effectiveness and efficiency because it created a common identity framework for all those involved and most probably reduced the potential drop-out rate as compared to a simple scholarship system. The unitary cost of a degree in Finland was higher than in a scholarship arrangement but the output and results far superior. None of the interviewed Nicaraguans questioned the efficiency of NIFAPRO

in what comes to having sent the students to Helsinki instead of a regional centre of excellence in agricultural biotechnologies. The value added by the learning shock lived by the students was deemed sufficiently high to justify the difference in costs, and the students were visibly empowered by the experience to which the Finnish higher education system was instrumental.

The change of political power in 2007 has affected somewhat the ownership of the project by the Nicaraguan authorities. INTA funded the language courses in 2007 before the inter-governmental agreement on NIFAPRO was signed but not afterwards, and after the first year (2007) INTA has not carried out the practical management of the project, assumed instead by the Embassy of Finland in Managua. A factor increasing probable sustainability of the results (eight graduates working at the laboratory) is the presence of donors who are dynamic and active in the field of agricultural biotechnologies in the country. All graduates may not stay on at INTA, however, because the working conditions are not optimal and the salary is low even by local standards. The graduates, however, do not seem likely candidates for emigration. The project design has been good in finding all thinkable measures to avoid the brain-drain that is often connected with higher education training projects in the industrialised world. And again, the high level of success is due mainly to the project modality as a complementary component in support of a sector-wide approach.

It is precisely from this angle that an evaluation can do justice to NIFAPRO. It has not been an institutional cooperation between higher education institutions or other ICI type of initiative but a project within larger sector dynamics. The modality of higher education training in the context of a multi-donor sector programme can be recommended to complement other bilateral cooperation instruments, unless it has been decided that Finnish universities should participate in MFA development cooperation only through the HEI-ICI instrument.

The table below summarizes the key findings, conclusions and recommendations:

SUMMARY TABLE: NIFAPRO

FINDINGS	**CONCLUSIONS**	**RECOMENDATIONS**
	Project design	
NIFAPRO has not been an ICI or HEI-ICI type of arrangement but a Project in support of a sector programme of several donors.	A relatively small investment can produce important results and a great potential impact when located in a sector supported by many donors.	The modality of NIFAPRO (a project in research capacity building as part of a joint donor support) could be considered by regional units or departments of MFA in fields where Finland has a particular comparative advantage academically.
Despite of not having had a logical framework, the Project Document was well thought-out, and provided for means to reduce risks normally included in university training programmes abroad in the “North”.	Besides the obvious results indicator (the number of MSc degrees produced), the Evaluation has had to construct indicators for efficiency and effectiveness.	

Relevance		
The Project has been highly relevant, even strategic for the agricultural sector in Nicaragua, although not all persons involved in the project have subjectively always understood the strategic potential of agricultural biotechnologies. The project has been fully compliant with the Finnish Development Policy Programme of 2007 when the project was initiated.		
Efficiency		
The cost of each MSc degree produced has been about 60.000 €. Contrary to expectations, none of the stakeholders and beneficiaries of NIFAPRO did question the efficiency and relevance of having sent the students to Helsinki (instead of, e.g., a Latin American university).	The price per degree is slightly superior of what would have been a normal university scholarship programme and the achievement of degrees in universities closer to Nicaragua but the output and results were far superior.	
Effectiveness		
The degrees were obtained for 100% of the students, and the active employment at INTA of the graduates is 80%.	The fact of having been a project in support and complimentary to a sector programme has greatly increased the effectiveness of NIFAPRO.	
Impact		
The Project developed professional capacities but it is too early to expect concrete poverty reduction impact or increases in harvests for improved seed production. But the potential impact of the project is great.	Academic training and basic research produce concrete material impact only very slowly.	
Sustainability		
The fact of having been a project in support and complimentary to a sector programme has greatly increased the sustainability of NIFAPRO's results. The fact that several donors are active in this sector in Nicaragua is a further guarantee of sustainability. The project's design had taken into account the aspect of sustainability from the very beginning and INTA has complied with the duty to provide employment to the graduates – which has reduced the probability of drop-out and increased sustainability.		

Cross-cutting issues	
Although not particularly mainstreamed in the project design, NIFAPRO has worked in accordance and in favour of most cross-cutting issues of Finland's development policies.	

2 Introduction

2.1 The Evaluation Mission

This is the final evaluation report on the Nicaragua-Finland Agro-biotechnology Programme (NIFAPRO), carried out jointly by the University of Helsinki, Finland, and the Nicaraguan Institute of Agrarian Technology (INTA). It is one of the three project evaluations commissioned by the Ministry for Foreign Affairs of Finland (MFA), undertaken in January-March 2013, on projects that have been funded by Finland in Nicaragua in the rural sector. The other two projects evaluated simultaneously were the joint Finnish-British PROPEMCE (Enhancing Small Enterprise Growth of Nicaragua through the Development of Existing Value Chains) implemented between 2009 and 2013, and PRODEGA (*Proyecto de Desarrollo de la Ganadería*), implemented between 1990 and 2003 in the Departments of Boaco and Chontales (the first phase 1990-1994 was named *Proyecto Integral de Desarrollo Rural*, PIDR).

The report is based on interviews in January with stakeholders and persons involved in the project implementation in Helsinki; on fieldwork in Managua, including review of documents provided by the Embassy of Finland and interviews with authorities, persons involved in the project and the NIFAPRO (ex) students. Six of the students (out of a total of 10) were interviewed individually, and a previous group interview was organised with five of them. The information obtained from the group interview was later confirmed by the individual interviews but was rather shallow compared to the latter because of the presence at the meeting of some staff members of INTA. The reason for not covering all of the 10 NIFAPRO graduates was that one had officially exited the programme and left the country (for another Central American country) and the three most recent graduates who returned from Finland only in December 2012, were not in Managua at the time of the fieldwork. INTA had not yet finalised their contractual arrangements and was waiting for budget allocations for their salaries at the time when this report was drafted (February-March 2013); but later the situation of two of them has been confirmed by a job contract with INTA.

The evaluation team was composed of:

Lars Eriksson Team leader, International expert on program evaluation, result-oriented management and local/rural development
Maaria Seppänen International expert on university education, gender and governance
Benicia Aguilar National expert on environmental matters, livestock and rural development
Kristina Boman International expert on value chains and economic development
Thomas Pijnenburg International expert on rural development and evaluation

Although the evaluation process and the present report have benefitted from different types of inputs from other members of the Evaluation Team, and team members have participated in these interviews in various combinations, it is Ms Maaria Seppänen who has primarily been in charge of the evaluation of NIFAPRO. When finalizing the report the main comments of stakeholders and two anonymous peer reviewers have been taken into account.

2.2 Objectives of the evaluation

For an evaluation of a project that ended only a couple of months ago, particularly when the project was about human capacity development in basic research, it is difficult to assess an impact, even more so when the Project Document did not include a logical framework against which to assess the project's achievements. The most important special issues stressed in the evaluation were, thus, effectiveness, efficiency, ownership, sustainability and Finnish added value. In fact, in this case these were tightly connected with each other. Since the project had no baseline or clear indicators, these have been developed as part of the evaluation. It is here supposed that the national capacities in agro-biotechnology at the start of the project have been near zero; some indicators are described below.

The overall objective of NIFAPRO was to develop Nicaraguan national capacities in agro-biotechnology and bio-security, and to contribute to the formulation of a national agro-biotechnology policy. The purpose was to improve technical staff's capacities in plant variety improvement, and to formulate a national policy of biotechnology adapted to Nicaraguan circumstances. The question that posed itself was how to analyse efficiency in a project that consciously took the decision not to take the cheapest way and sent the students to Finland (instead of some regional university, for instance). In addition, NIFAPRO has been a project in which most of the budget has been spent in Finland. Normally the tying of aid is considered a problem and is censured by OEDC-DAC guidelines: the best practices of development cooperation recommend that as high a percentage as possible of aid be used in the target country, not in the donor country. It cannot be excluded that this relatively low percentage of budget spent in Nicaragua (and in the host institution INTA) has affected the feeling of ownership of the project on the Nicaraguan side.

The approach in this evaluation consisted of some proxy indicators that, it is hoped, together will illustrate a certain degree of efficiency or inefficiency. The first was the standard "opportunity cost" approach: could the same results have been achieved with a lower expenditure? If yes, was the Finnish added value in the project so high that it compensated for and justified the extra spending compared to costs involved with sending students, say, to Mexico or Colombia or any closer place where good level Master's degrees could have been acquired in agricultural biotechnology?

The second proxy for efficiency was the modality by which the results were achieved. In this case the modality has been a project – as contrasted with a simple system of scholarships. Was a project a more efficient way of producing the results than sending ten students to study in Finland with all expenses covered and paying for two scientific congresses as independent events? During the evaluation, this question turned out to be of primordial importance.

Effectiveness was assessed by the degree of employment of the NIFAPRO students in jobs where they qualify and contribute to the objectives of the project. The evaluation will not necessarily see a problem of diminished effectiveness if not all graduates remain employees of INTA after their contract period ends (it is twice the time of their engagement in the project); a job in relevant (preferably public sector) employment will be considered sufficient. This aspect of effectiveness relates to sustainability, as there seems to be interest in initiatives funded by other donors to use the NIFAPRO students in compatible qualified tasks for the benefit of the country.

It is important to repeat here that in several documents (e.g. the Memorandum of Understanding between Finland, MINREX, MAGFOR and INTA signed in December 2007) NIFAPRO is defined as a human capacity building project ("Human Capital Development in Agricultural Biotechnology Programme"). In the correspondence

related to the signature of the MOU, the programme's objective is said to be the "Strengthening of the capacities of INTA's technical staff".

Contrary to these definitions and the objectives implicit (or explicit) therein, the TOR for this evaluation (Annex 3) make a conceptual leap that the Evaluation Team considers premature. In the section on relevance, the evaluation is asked to assess the consistency (relevance) of the programme with the needs of poor people and small farmers of Nicaragua. This is stretching causality too far: human capital development in basic research at a government institution responds to the needs of the poor and small farmers only very indirectly and in the long run. In any case, as the needs of the poor people of Nicaragua and small farmers are not inside the causality tree of project objectives, it would be unfair to assess NIFAPRO against goals far beyond the intended reach of its own objectives. The correct question of relevance would have concerned the consistency of the project with government priorities in science and technology and agricultural strategies and with the existing human capacity needs of the country. In this view, the project is seen as fully relevant.

In addition, because the project has only recently ended (December 2012), it is much too early to evaluate any long-term impact of the project on economic development or poverty reduction. However, an attempt to assess the potential impact of agro-biotechnologies on productivity was made. The chosen example was cacao, a rather limited crop geographically and commercially but which is the current topic of research of two of the NIFAPRO graduates. Any estimates on economic returns of biotechnologies in bigger sectors (for instance bean farming) would have been frankly impossible at this stage, when considering the volume and the diversity of modalities of production, and the extension of farming and diversity of social and economic conditions of farmers.

In consideration of the official closure of bilateral development cooperation between Finland and Nicaragua at the end of 2012, the evaluation has mainly been targeted towards the need of knowledge that Finnish actors/instances may have, and less to a Nicaraguan public. More stress is given to the institutional arrangement at (and with) the University of Helsinki as compared to other possible alternatives, less to the specific Nicaraguan or regional future agricultural biotechnology trends. This is due to the oral information from the MFA on 22 January 2013 that projects similar to NIFAPRO would be ineligible for Central America because Finnish funds earmarked for the region will be heavily shrinking in the near future. The other piece of oral information, i.e. that NIFAPRO as implementation modality does not fit in any existing aid instrument and is not likely to be repeated, will be analysed below towards the end of the report.

3 Description of the Intervention

3.1 Background of NIFAPRO

The Nicaragua-Finland Agro-biotechnology Programme NIFAPRO was designed as a complementary input to support the other rural sector interventions or sector budget support programmes funded by Finland and/or other donors. Those were – at the time – the active small farmer sustainable livelihoods project FOMEVIDAS (*Fomento de Medios de Vida Sostenibles, 2004-2011*) and the joint donor sector programme PRORURAL (Productive Rural Development Sector Programme, 2006-2012). The NIFAPRO programme was exceptionally designed by the Embassy of Finland together with Nicaraguan and Finnish academic experts in plant production science (INTA; the National Agrarian University, UNA, and University of Helsinki, UH) who already had

established channels of collaboration, originally through a university training programme of Sweden (Sida) at Nicaraguan universities in the context of which the Finnish and Nicaraguan experts had made acquaintance.

One of the specific objectives of PRORURAL was to incentivise and boost technological innovation processes in agricultural production-related research and technical assistance in order to overcome the great problems of competitiveness along the food chain in the Nicaraguan agricultural production. As biotechnology and biotechnological research is increasingly used globally by the private sector, particularly by some few transnational companies, a poor developing country easily runs the risk of seeing genetically modified seeds and pesticides/herbicides being imposed on it. The Programme NIFAPRO was justified in the documents by stressing the importance of the public sector to respond to these challenges, to increase agricultural production and productivity and biosafety through an improved research capacity. This aspect is particularly important in the case of “basic grains” (*granos básicos*), e.g. the staples bean and maize that have native, endogenous varieties whose genetic characteristics have not yet been studied scientifically, and that thus constitute an untapped genetic resource (from the scientific point of view).

Nicaragua is a country that strictly speaking does not produce improved seeds. Most seeds from beans to seed potato are imported (e.g. from Colombia or Mexico in the case of beans, and from the Netherlands in the case of potato), and INTA, the agricultural technology institute, empirically selects the varieties with best performance in local conditions in experimental stations located around the country. The seed production process is three-layered, the Institute producing the first generation of a genetically pure variety, which is given to specialised seed production cooperatives to grow the next generation (basic seed) in larger qualities with possible genetic variations of spontaneous origin, and the third generation (registered seed) that is then certified as coming from the original genetically pure variety.

It is only as of 2010 that the *Dirección General de Protección y Sanidad Agropecuaria* (DGPSA), which is the competent authority in charge of food safety at the Ministry of Agriculture and Forestry (MAGFOR), certifies seeds as genetically corresponding to the original pure variety and as free of pathogens. However, only 22-28% of Nicaraguan farmers use certified seed, according to information delivered by INTA. Furthermore, as the certification inspection and diagnosis are based on seed samples, spontaneous genetic variations, common in volatile chromosomal constellations, are not excluded in the final seed lots entering the market. This situation leads to low harvest levels, high incidence of plagues (above all different types of fungi, moulds and yeasts) leading to loss of production. Due to climate change, plant plagues tend to be on the rise as in most parts of Nicaragua humidity is increasing, as shown by the recent epidemic of “*la roya*”, a mould (Lat. *Hemileya vastatrix*) seriously affecting coffee harvests in Central America in the 2012-2013 harvest season.

Summing up, the background of the Programme is the objective need in Nicaragua of trained personnel and public policies to take advantage of new biotechnological innovations and regulate their use, in order to have seeds of better quality, improved control of pests and diseases, enhanced breeding of superior varieties using molecular markers, and the use and preservation of untapped genetic resources. The Programme auto-excluded from the beginning the objective of developing trans-gene organisms (commonly called genetically modified organisms, GMO) and limited agro-biotechnologies to the use of genetic markers as instruments of seed improvement because of the controversial nature of GMOs in Nicaragua and due to the public policy to avoid the use of them in general in the country.

3.2 Political context

At the time when NIFAPRO was planned and designed, the competent Nicaraguan institutions were actively involved in a process of developing national legislation concerning biotechnology in general and agro-biotechnology in particular. The process was led in a participative way in consultation with stakeholders representing several governmental bodies under the auspices of the United Nations Food and Agriculture Organisation, FAO. By the end of 2006, when the final project document of NIFAPRO is dated, INTA had presented two law proposals to the Parliament (one on risk prevention from genetically modified organisms, another on conservation and sustainable use of biological diversity).

At the time of the formulation of NIFAPRO, there were several initiatives to develop and regulate biotechnologies and to guarantee biosafety (the reduction of risk from alien, introduced pathogens and genes[1]) also at the regional level, mainly in the context of the Central American Integration System (SICA), particularly its agricultural technology branch (SICTA, Central American Integration System of Agricultural Technology). This regional initiative and a second one, the hemispheric biotechnology programme, were planned to be facilitated at the national level by the outputs of NIFAPRO (trained Master's level graduates and national biosafety policies).

When NIFAPRO was planned, by November 2006, the topics of biotechnology, agro-biotechnology and biosafety were a priority of the outgoing government. Earlier the same month there had been presidential (and parliamentary) elections where a new political power (the FSLN) had acquired parliamentary majority and won the presidency. The change of government most probably has affected the ownership by INTA and the sustainability of results of NIFAPRO, but it would be pure speculation trying to estimate the difference between what the situation is now and what it could have been, had the previous political forces continued in power. Anyway, the fact that the law proposals presented to the Parliament in 2006 have not yet been approved shows that biotechnologies and agro-biotechnologies have not been very high on the list of priorities of the Nicaraguan government since January 2007.

In March 2007 there were parliamentary elections in Finland, and as a result of changing governmental coalitions and internal issues of political parties, a new policy for development cooperation was approved in October 2007 (Development Policy Programme). The new policy programme introduced a new focus by "lifting" the topic of environment from the level of cross-cutting issue to the category of priority sector, and posited "ecologically and economically" sustainable development as the overall goal of Finnish development cooperation, with stress on agriculture and natural resources. The new policy also gave a much heavier weight to *Finnish added value* than had been the case in the policy programme of 2004 where the concept first made its appearance. Whereas the latter had left the concept mainly undefined and implied that "added value" came from some commonly held values, the 2007 policy programme gave it an instrumental role of increasing the presence of Finnish know-how, expertise and personnel in development interventions.

Therefore it can be said that NIFAPRO corresponded well to the Development Policy Programme of 2007: its sectoral orientation (agriculture, biotechnologies) was aligned with the policy, and its location at a Finnish institution, with heavy input of Finnish know-how, gave it an extra component of Finnish added value. As a conclusion: in the case of NIFAPRO, the change of development aid policies in Finland did not affect the implementation of the project.

[1] Biosafety should not be confused with bio-security which relates to warfare and defensive preparedness against biological military threats.

3.3 Project design

The project document, dated 23 November 2006, does not have a logical framework of objectives, results and activities. However, the document is reasonably well thought through, and on the basis of its elements, one can construct a tree of objectives. Table 1 shows one possible reconstructed way of seeing the causal logic behind the project's design, although the terminology used in the document does not fully correspond to the habitual meaning of the terms.

As can be seen from this reconstructed objectives tree, not quite all activities or objectives were strictly in a logical causality order. On the other hand, the design shows that some of the earlier problems involved in projects of higher education training abroad in the industrialised world (particularly brain drain and impossibility to find suitable jobs after obtaining the degree) have been tackled from the start, and practically all thinkable steps to prevent them have been foreseen.

Table 1 Project logic

Objectives tree	**Activities**	**Commentary**
Development objective: Capacities of Nicaraguan national agricultural institutions improved, to contribute to fight against poverty and enhance the competitiveness of the agricultural sector.		The project is designed to complement other activities within the rural sector that Finland is funding (PRORURAL, FOMEVIDAS) and of other donors (e.g. FAO). This is expressed in the project document as the *purpose* of NIFAPRO (in a meaning not usually given to 'purpose' in the log-frame vocabulary).
Main objective: To build national capacity and competence in agro-biotechnology and biosafety, and contribute to biotechnology policy development in Nicaragua.		NIFAPRO seen as a Finnish contribution to ensure the training of personnel necessary to carry out the national biotechnology strategy and to comply with biosafety regulations.
Results		
Result 1. University training at Master's level in Helsinki for 10 Nicaraguan students.	-selection of students -contracts signed, commitment to the programme -study scholarships, residence permits, other practical matters -studies in Helsinki and parallel "sandwich" work at INTA during holiday seasons	This seems to have been the main strong idea behind the project.

Result 2. Employment of graduates as INTA employees; integration of graduates as permanent staff at the laboratory CNIAB	-contractual arrangements, contracts signed on commitment to engage in NIFAPRO and later at INTA -budget allocation for graduates' salaries; job contracts at INTA signed -labour conditions permitting effective laboratory work	The World Bank equipped the laboratory at CNIAB. No direct funding from Finland for INTA (except for PRORURAL allocations). This result constitutes a thought for sustainability.
Result 3. National biotechnology policies advanced.	-training via research -three workshops on agricultural biotechnologies	Two international congresses were organised, and several scientific articles on research results published by the graduates.
Result 4. NIFAPRO graduates form a critical mass with networking capacities with the national and international biotechnology research and decision-making institutions.	-as a *side product* of studies in Finland (learning English, drafting scientific papers, networking with fellow students and teachers from many parts of the world) and of the scientific workshops in Nicaragua	This result is inferred from ideas in the project document. It could be seen as an objective of NIFAPRO (or purpose in the usual log-frame meaning of the term) because its achievement is a result of all other results and would lead to the higher objectives.

The project was based on a "sandwich model", meaning that the students interrupted their stays in Finland for a lengthy fieldwork period in Nicaragua, in order to collect material for thesis between the first and the second academic year. Considering that the thesis topics concerned tropical plant seeds or pathogens, this was practically speaking the only way to have experimental material; Finland would not have offered the climatic conditions for these experiments.

3.4 Implementation of the project

3.4.1 Selection of students

The original plan of NIFAPRO was to select two lots of five students for the English-speaking Master's programme in plant production sciences (in Finnish: *kasvintuotantotieteet*). However, in practice there were finally three batches of students (4+3+3). The reason for this change was that in the first selection process, one of the five selected students gave up and resigned before leaving for Finland. In the second selection, only three eligible students fulfilling all the requirements were found, and a third selection process was organised in 2010 to fulfil the quota of ten. This is the last batch of graduates that returned to Nicaragua only in December 2012.

The study scholarships for Finland were announced at the Internet (Embassy pages, among others) and the two Nicaraguan newspapers of national distribution. The future students had learned about the possibility of engaging in the programme from university professors, colleagues or even relatives, or from advertisements on notice boards of the UNA, the national agricultural university. The requirements of eligibility combined the regular eligibility requisites of the University of Helsinki (UH) and other, project-specific requirements. The former included an earlier completed BA (or BSc)

level degree in agricultural, biological or horticultural sciences and a certain level of proficiency in English in order to be able to enrol in the Master's degree programme in English. The latter requirements were related to future work at INTA: applicants should be less than 30 years of age, have earlier work experience, motivation and commitment to the programme. The commitment implied also financial sacrifices (full-time language courses – meaning one had to resign from one's former job – and a non-paid fieldwork period in Nicaragua between study semesters in Finland, among others). In the first selection process, earlier work experience and behaviour in a laboratory situation was tested by an observation panel, following an initial selection based on applications and personal interviews. The laboratory behaviour test does not seem to have been included in the later selection processes.

In the first selection process the results were communicated to the ten shortlisted applicants. The scores were made known, and the applicants with the five highest scores were appointed for the programme. In the later two selection processes this transparency was missing. The second and the third selection processes also lowered the requirement concerning completed BA degree, and several graduates reported having had a certificate from professors or the university that the courses and other requirements for a degree were completed but that the official degree certificate/ diploma had not yet been handed out at the time of application.

This fact suggests that NIFAPRO might have exhausted the pool of eligible applicants in Nicaragua during its duration, and that it would take some years before a new generation of young BA/BSc graduates would form and the project would again find suitable candidates fulfilling all the requirements – in case there would be a continuation of the project. The last three students, selected in 2010, had been subjected to disciplinary measures for no-show by a disciplinary committee formed by the Embassy and representatives of INTA during their "sandwich" stay in the second half of 2011, probably due, at least in part, to communication gaps between the UH and INTA. In February-March 2013, when this report was being drafted, there was talk about one of them negotiating her desertion from the programme; which indeed did happen in March

In the principles for student selection, it had been agreed not to put limits in terms of the applicants' parents' income level (according to some interviewees, particularly the Embassy of Finland did not want to discriminate students according to income levels). Two of the graduates had applied to the NIFAPRO programme from a foreign private agricultural university in the region, and it may not be pure coincidence that exactly those two have negotiated or are negotiating abandoning the programme. Perhaps more than a question of family income level this may be a question about degree of commitment: for those with a degree from the private (and expensive) Zamorano University (Honduras), studies at the UH are only one of the many future possibilities whereas for a regular BA graduate from a national Nicaraguan university, the possibility to study in Europe is an "once-in-a-lifetime" opportunity.

Of the remaining students, six came from the UNA, and two from the University of León, with slightly different background orientation (in agro-ecology, not in plant production).

Another decision that had been taken concerning student selection was to give priority to competence in the substance matter (academic qualifications and aptitudes), not to previous proficiency in English. In hindsight this was the only rational decision, because so few potential candidates could have applied had this requirement existed. Only one of the graduates had proven fluency in English (a TOEFL approved) at the moment of applying for a NIFAPRO grant, and another one had a fair level of English, however without a certificate. For all the others English was rudimentary at best.

To bridge this gap between required language proficiency and the reality, the programme chose the “hard” and expensive, but the only possible, way: to train the selected students up to a language proficiency level of coping with university studies in Finland. The students were given full-time intensive courses in English in Managua for up to six months, and they had to pass a mini language test before departing for Finland. As the courses were tailor-made for the selected students, the teaching was intensive (only 2-4 participants per course) and personalised.

To enrol in the programme they had had to give up their jobs; most had been working at the time of applying to NIFAPRO. The courses plus board and lodging were paid first by INTA (in the first half of 2007), and in the second and third rounds, by the programme itself. (For more on this curious fact, see below 3.4.4.)

The language courses were included in the contract signed by the students. In 2007, the students signing the contract committed themselves to reimbursing the cost of the language courses in case of desertion from those courses or from the study programme in general, for a cost of USD 2,375.00; in subsequent rounds the commitment was to reimburse the whole scholarship spent by the programme for the student. However, in the legal agreement there is a back door out of the situation: “unless otherwise agreed with INTA”.

The subjective feeling as to whether the acquired proficiency level in English was sufficient varied among the students. Some found themselves plunging naturally into daily use of English; some preferred a sudden muteness during a couple of months for fear of speaking. The understanding of spoken English depended on who was speaking, as the Master’s programme in English had students from China and India to Africa, with unknown English accents to the Nicaraguans. In general, Finnish teachers speaking English were deemed rather easy to understand (the phonetic difference between Finnish and Spanish is, after all, small, the principal difference being intonation). – Of course, the subjective feeling of being able to cope in a foreign language does not necessarily coincide with the objective proficiency level.

It is practically impossible to estimate the degree to which language proficiency – or the lack of it – affected academic performance. At the University of Helsinki it was generally considered that the academic performance of the Nicaraguan students improved all along their stays in Finland. However, it would be too hasty to attribute this improvement to language skills only. According to all interviewed students the main difficulty at the start was due to differences in pedagogical traditions between Nicaraguan and Finnish agricultural faculties – or educational systems in general. A third factor, pointed out by the UH, was the initial level of knowledge in sciences that was lower in the case of the Nicaraguans than in other BA level degree holders enrolled at the Master’s programme, but which the NIFAPRO students were able to catch up along their studies in Helsinki. Anything that could be described as cultural shock did not spontaneously come up in interviews with the graduates, nor was the Finnish climate raised as a particularly shocking experience.

The road may have been rough and the ride bumpy but finally all Nicaraguan students attained the proficiency level required by the University, without which a student cannot officially enrol as a regular student pursuing studies leading to a degree. In some cases this happened only towards the end of the Master’s programme. The solution found by the Department of Agricultural Sciences, remarkably flexible for a country rather known for being strict, was to enrol the students who failed the language test as visiting students, and finalise the official enrolment as degree students only once the English proficiency test was passed. According to the Department, this was the only “stretching” of standards they made in the context of the Nicaraguan students – they stretched the number of times the language test was allowed to be tried out.

The Embassy of Finland had handed out information material about Finland for the outgoing students, organised an official dinner in honour of them, and some informal talks with the rural sector counsellor(s) have taken place. Upon arrival at the UH an introductory course was organised for all the Master's degree programme participants on practical and academic matters of the University. However, deducing from the interviews with the graduates and the vivid descriptions of the challenges they faced, it seems that the "real nature" of the educational system and particularly the pedagogical principles of Finnish university education revealed themselves to the students only over time.

3.4.2 Studies in Finland, University of Helsinki

Upon arrival in Helsinki, the students were received at the airport, the first time in 2007, by faculty staff involved in NIFAPRO, later by faculty staff, Finnish doctoral students or Nicaraguan NIFAPRO students present in Finland. In general an affordable student dormitory housing was arranged for the students (300-400€/month). There is a relatively abundant offer of student housing in the Helsinki region, particularly outside the city centre, which is where the Viikki Campus of Life Sciences (biosciences campus) is located. The monthly scholarship awarded by NIFAPRO to the students during university terms in Finland was 1,300 €, a relatively generous amount in relation to average student income in Finland but in line with the minimum funding required by the Immigration Office for foreign degree students.

The first batch of students had to deliver a research plan for Master's thesis upon arrival in Helsinki; for the two following batches the deadline was in December at the end of the first term. After the full academic year, the students returned to Nicaragua to work at INTA-CNIAB on experiments for thesis fieldwork and returned to Helsinki only in January the next year. According to information gathered from the interviews, the "sandwich" months spent at INTA between two stays in Finland were not paid, and the students had to find a way to pay their expenses. For the second and third round students, internships in Finnish horticultural, agricultural and forestry research stations were included at the end of the first academic year (May-June-July) before travelling to Nicaragua for their "sandwich stay". The first batch of students had to graduate in two academic years (including the "sandwich stay" in Nicaragua, i.e. September y_1-September y_3. The following batches were able to complete their studies in two and a half academic years (September y_1-December y_3).

Besides some difficulties encountered in understanding lectures (and catching up with the general level of scientific knowledge), the main challenge faced by the Nicaraguan students turned out to be – expectedly, one would be inclined to say – the pedagogical underpinnings of the Finnish educational system. Here this evaluation report will go to some detail in analysing concepts such as the "banking method", plagiarism and different modalities of examinations, and their connections to ways of learning. The issues may sound technical but their understanding is indispensable for the evaluation of the project, below in Findings (Chapter 4). What follows is a schematic presentation of two systems of learning, and is not meant to suggest that the Finnish system is unproblematic. All pedagogical systems favour certain personality characteristics at the detriment of some others.

The starting point for the analysis is what the NIFAPRO graduates told about their study experience in Finland when interviewed individually and in private.

Examinations: The Nicaraguan students had a shock when learning how many pages they had to read for the examinations. On the other hand, they were quick to answer examination questions and wondered why other students stayed on at the exams for

hours while they had the answers ready in thirty minutes. When the results came out, they were surprised to learn the low marks they were given, because they themselves felt that they had known the right answers quite accurately, used as they were to multiple choice questions in examinations (with only one possible right answer).

Seminar papers: Tough luck also with seminar papers. The Nicaraguan students were criticised for deficient quoting practices and of plagiarism – a term they had never even heard during their studies in Nicaragua. The standard kind of academic writing in Nicaragua had been to reproduce as accurately as possible what was written in text books, and, as it seems, without quoting too much the sources.

Structure of studies: In Nicaraguan (as well as in many European) universities, the study programmes leading to a degree are built of pre-established blocks of compulsory courses. The system reminds that of a school where the whole promotion of a certain year goes through the same courses, the approval of which is the condition for graduation. For the Nicaraguan students, it was difficult to understand the system of credits (earlier called "study points" or study weeks in Finland). At the UH, as now in other European universities too, the system is the ECTS (European Credit Transfer System) where the number of credits done (120 ECTS for a MA or MSc) is the condition for the degree diploma, and each course has a certain number of credits according to the workload it requires in terms of number of lecture hours or seminars, writing of papers, pages to read for exams etc. There are very few compulsory courses in Finland; the rest of credits can be taken from a large variety of courses on different topics according to one's interests and future plans for professional life, or just for intellectual curiosity.

Analysis: The situation lived by the NIFAPRO students was a clash between two pedagogical systems: they were implicitly, or even explicitly, asked to deliver something they had not been prepared to deliver. The Nicaraguan system encourages learning by heart, with emphasis on details, of material produced by others. As if there was a master "feeding" information from above and the students have to "swallow" without digesting what is being fed to them and keep it in mind. This educational method that on occasions has been called the "banking method" has been criticised by thinkers such as Jean Paul Sartre in Europe and, in Latin America, Paolo Freire, the founder of liberation pedagogy.

In this system plagiarism is a non-sense concept, because the better one is prepared to repeat what the master says (or does) the better. This system favours those with good memory for details and the ability not to question too much what is being taught; it does not incite innovation. By no means has this system been detrimental to learning in all circumstances. On the contrary, master pieces of late Middle Ages and Renaissance painting have been produced with this method (the apprentice-master system). But obviously the requirements at the job market in the 21st Century are not quite the same as in times before Enlightenment.

The Finnish system gives wide space for personal initiative and encourages and favours the individuals who know what they want. On the other hand, the system is generally little tolerant and prepared to help those who would need orientation in how to go about with their studies and future plans. However, in the case of NIFAPRO students the University responded well and made an extra effort to guide the students even in matters that other foreign students had to deal with by themselves. The system is based on the idea that research advances fast and detailed information changes constantly; therefore more important is that students learn to search information, process it intellectually and express it in academic writing. However, university teachers in Finland often fail to make explicit this principle to the students in their teaching; with NIFAPRO this does not seem to have been the case.

The fact that the NIFAPRO students all graduated with at least average notes shows that a) the student selection process was able to select students with the necessary ability to learn a new way of learning; and b) the Finnish system has in this case been able to reach out and assist its "project students". The enlightening process of learning new ways to learn may be one of the reasons for the strong personal feeling of empowerment visible in the NIFAPRO graduates. On the other hand, this difference of pedagogical systems did not come up in the discussions with the UH faculty staff, suggesting that the problem was dealt with empirically and case by case, without uniform didactic response.

3.4.3 Back in Nicaragua

When returning to Nicaragua, the NIFAPRO graduates have been hired by INTA; at the time of this evaluation, only the three last graduates were waiting for their contracts as INTA still was processing the budgetary allocations for their salaries, and one student was reported to negotiate her desertion from the programme. In only a few cases has the employment contract been readily available upon arrival in Nicaragua, mainly because the return happened while the degree diploma was still being processed in Helsinki. In one case it was reported that NIFAPRO paid an extra stay in Finland for processing scientific material in laboratory conditions.

The hired ex-students of NIFAPRO are working at the CNIAB laboratory (equipped with the funds of a World Bank project) in germplasm (seed collections, mainly of beans), plant pathology (beans, cacao and maize), genetic marker-assisted plant breeding and analysis of genetic diversity; the research on the nutritional quality of crop products such as beans and maize grains is immobilised because both graduates specialised in nutrition have abandoned the programme. The research centre CNIAB itself has recently been renamed CNIA deleting the reference to biotechnology from its name. It remains to be seen if this change is symbolic of something or just an insignificant cosmetic detail.

The conditions at the laboratory are functional but not optimal. There is a series of obstacles to efficient job performance that prevent the NIFAPRO graduates from putting into practice all their acquired knowledge and capacity. Some are economic in nature. For instance, the laboratory is out of town and has to rely on an artesian well for water, which is too chalky (hard) for use in laboratory tests, and purified water costs money. For chemical reagents there are few providers in the country and the reagents are extremely expensive by international standards (possible cartel formation). Also, even a state institution such as INTA has to pay value-added tax and customs taxes and duties for purchasing supplies. Many of the equipment items at the laboratory are not used because they function with 220 V, and the laboratory has 110 V electricity only, even though in Nicaragua the 220 V current is less expensive than the lower tension current. In addition, there is no petty cash system and everything has to be tendered, even individual ball-point pens. Latex glows, for instance, belong to the category of very scarce elements. Mutual help systems (e.g. borrowing from UNA) are the only way of coping with the situation. Another one is paying these indispensable expenses from one's own pocket.

However, the most important problem is the salary level. With a monthly remuneration of less than 400 €, the salary is low even by Nicaraguan standards for the public sector, and it was pointed out by the graduates that INTA technicians or university car drivers with no university degree may earn more than they do, despite their having locally rare Master's degrees.

3.4.4 Administration

In the original project design, a Technical Committee was officially established but it convened only a few times at the beginning of the programme. The main decisions concerning lines of action and other important matters have in practice been taken by a Supervisory Board, consisting of representative of the MFA, the University of Helsinki, and the Embassy of Finland in Managua, INTA, the Ministry of Agriculture and Forestry (MAGFOR), and the National Agrarian University UNA. The meetings have been through videoconferences (the facilities are located at the Embassy in Managua and at the University of Helsinki and MFA in Helsinki).

It is noteworthy that INTA paid for the language courses and other expenses for the first outgoing students before any legal agreement on NIFAPRO had been signed with the students. The first legal script (the students' engagement with the programme) is dated August 2007 when the students were already preparing for departure and the language courses were over. Similarly, INTA covered the language courses before a bilateral Memorandum of Understanding (MOU) between Finland and Nicaragua (MINREX and INTA) was signed; that happened only in December 2007 when the first batch of students had already spent one academic term in Helsinki. It seems that there had been some reticence or confusion about the necessity to sign a MOU on NIFAPRO at the Nicaraguan side, deducing from the fact that the Embassy of Finland had to send an official letter to MINREX (July 2007) to persuade Nicaragua to do it. – Paradoxically, as it happened, INTA's active involvement in NIFAPRO took place before any official and legally binding agreements concerning NIFAPRO were signed; after their signature INTA has mainly complied only with the most basic commitment: that of offering employment to NIFAPRO graduates.

The MOU establishes that INTA is the implementing agency of NIFAPRO. In the following year (2008) INTA experienced a financial crisis and little by little practically all commitments made by the institution in the MOU were transferred to (or rather, assumed by) the Embassy of Finland. After the financial crisis was over (end of 2009) the situation did not return to the pre-2008 situation. The Embassy has been in charge of residence permits, insurances etc, and of processing expenditures on behalf of NIFAPRO, and the Embassy rural sector assistant has been a central contact point for the students.

In practice, most of the project budget has been spent in Finland. At the end of NIFAPRO the remaining funds were used for purchasing equipment for INTA in December 2012. The financial management has been a bit complicated. The procedure was for the University of Helsinki to invoice the MFA for expenses incurred, which represented the scholarships handed to the NIFAPRO students, administration necessary for running the programme, and the research expenses of the students. The invoices have been sent by the Ministry to the Embassy in Managua for revision and approval, and then the disbursements have been made to the UH. However, some payments have also been made directly by the Embassy from the NIFAPRO budget through the MFA financial management system. These expenses have in general been approved by the Supervisory Boards, and consist of costs of air travel, per diems for travel days, health insurances of the students, and the costs of the scientific congresses. This means that there has been a system of double budgetary exit doors: one on invoice to the University, the other directly used by the Embassy through the Ministry's financial management system.

This system has a source of some confusion, although it is understandable that these expenditures were decentralised to the Embassy level instead of being handled at the university administration. The UH has not always known what payments have been processed by the Embassy from NIFAPRO funds; it has ignored the amounts

remaining available. At the Embassy, in February 2013, it was not even known that the disbursements made for NIFAPRO were from a budget officially granted to the UH. It seems the Embassy has not reported to the UH what were the disbursements made by the Embassy from the NIFAPRO budget.

At the moment this report is being drafted, the MFA is trying to handle an overpayment. It had been agreed that remaining project funds be given in kind to INTA, but –for one reason or another – the disbursement approved by the Embassy staff exceeded the amount of available funds in December 2012 at the closure of the project.

3.4.5 Other activities

The NIFAPRO programme has organised some activities additional to its main target, i.e. the university training of Nicaraguan students. Two scientific congresses were held (out of three planned), the first in 2008 with international participants from Europe and Latin America, where the selected students presented their research plans, and a second in November 2011, entirely organised by the NIFAPRO graduates and students. Particularly the "Second NIFAPRO Multidisciplinary and International Congress on Agro-biotechnology on Plant Genetic Resources" was generally deemed a huge success, with an important number of international participants. Representatives of UH participated, too. The first congress was attended by 104 persons, and in the second, there were over 200 participants from the Central American region and from South America, plus the United States. According to all interviewed persons the debate was very lively, particularly at the second congress. The participants included farmers and university students in addition to NGO activists, researchers and governmental authorities. Above all the topic of GMO was a cause of debate, with strong opposition from the audience against the access to the country of these modified seeds.

There were some initiatives to start a North-South-South exchange within the context of NIFAPRO, and one academic from an African country was brought to Nicaragua for the first international conference (the Makerere University of Uganda). This initiative did not prosper, however, and remained without follow-up. Of course the congresses helped to build regional (continental Latin American) contacts, too, although these are not normally included in the category of South-South cooperation.

Four Finnish Master's thesis students have visited Nicaragua and INTA, the first two in 2010 and the others in 2012. Two of them carried out research in plant pathology (tar spot complex in maize, seed pathogens in beans) and two in agro-ecology (mycorrhiza of maize and potato production). Their funding was not covered by NIFAPRO but from university mobility funds and/or thesis grants; however, they worked at the INTA-CNIAB facilities when not collecting material in the field.

The UH staff involved with NIFAPRO have visited Nicaragua and INTA regularly, to follow up the project. These visits included monitoring of the construction and equipment of the laboratory, discussions with INTA and the Embassy on the progress being made by the students and on the on-going research carried out by the students/graduates.

4 Findings of the Evaluation

4.1 Relevance and ownership

In the case of NIFAPRO, as in many other evaluations, it is useful to make a distinction between objective and subjective relevance of a project. NIFAPRO is extremely relevant in objective terms. In addition to the justifications mentioned in the project document (see above), the current year has been declared the Year of Productivity, and a loan (MUSD 40) for biotechnologies from the Inter-American Development Bank (IADB) has been signed. It will be used 50-50 by MAGFOR and INTA, so in principle the NIFAPRO graduates and their skills will be needed and useful for any future activity in this field, due to attract funding from many donors. In addition, a factor not mentioned in any document, agro-biotechnologies used for improved seeds and increased production levels may contribute to slowing down the advance of the agricultural frontier; so far increased harvests in Nicaragua are the result of increases in cultivated area, not of higher productivity per hectare. NIFAPRO may also prove relevant for a national research and technology strategy which is in a planning phase in Nicaragua, and the scientific congresses organised in the context (and by) NIFAPRO have increased consciousness about the possibilities and dangers of biotechnologies, as pointed out by several interviewees. Those who are acquainted with the topic of agricultural biotechnologies and have a good understanding of the sector recognise that NIFAPRO is of strategic importance for the country.

On the other hand, it is evident that not all persons or institutions involved in this field subjectively understand the relevance and strategic reach of biotechnologies for the country. Furthermore, personal animosities and/or institutional jealousies seem to have prevailed occasionally in detriment of NIFAPRO and its possible contributions, as was shown by the case of the former national project director who resigned from his position at INTA to found the agro-biotechnology laboratory at the new Ministry of Family, Communal, Cooperative and Associational Economy (MEFCCA) in the second half of 2012 (after which the B for biotechnology was deleted from the name of CNIAB).

Although INTA has complied with the fundamental condition of the MOU signed between the Governments, the employment of the NIFAPRO graduates, it seems rather clear that the change of political power in 2007 has affected the ownership of the project by INTA to a certain degree. It is true that at the starting point in 2006, the situation was exceptional, because the then director of INTA was a specialist in biotechnologies and the sector was very high on the sector list of priorities at that time. After 2007, and particularly after the signature of the intergovernmental MOU in December 2007, INTA has neither paid for the language courses of the outgoing students nor taken care of the practical arrangements of the students for lack of administrative capacity, as was foreseen in the agreement, and all administrative affairs had to be assumed by the Embassy of Finland. A budget almost entirely spent in Finland may have affected the feeling of ownership of the project on the Nicaraguan side and may explain why the signature of the MOU took so long. Practically no financial resources have accrued to the Nicaraguan host institution, beyond a small donation of left-over resources at the end of the project (of the order of 10,000 €).

4.2 Effectiveness

NIFAPRO has produced more or less the results it was designed for. Ten students (100%) have graduated from the UH with the title “Master of Science in Plant Production Sciences”, and nine of them are in place in Nicaragua (one – female – graduate has emigrated to Guatemala). All returnees are employed by INTA by April, except two who abandoned the programme. Therefore, in terms of output, the success has been 100% for degrees and 80% for effective work at INTA.

Although the conditions at the laboratory are not optimal, the students are working and doing research on relevant topics, mostly on plant pathogens (beans, maize, cacao and potato), plant genetic resources and breeding. The first ones to graduate will soon have complied with their obligation and commitment to work for INTA twice the time of their studies, and some may leave INTA. However, this should not be seen as a total loss. Whether working in other parts of the public sector or even in the private sector, their contribution can make a difference, and any initiative by the donors left in the country can benefit from the resource created. The graduates are not likely to immigrate, at least not to any important extent. However, two of graduates will share their time between Helsinki and Nicaragua for the next two-three years[2]. In general, it can be considered that the most important result expected of the project, the production of trained agro-biotechnology specialists at the Master's level, has been fulfilled.

A side-product of the degrees has been the important body of research carried out by the students and graduates, corresponding to about 10 years of research. The publication of the research results in academic journals and/or at the university e-thesis data base increase the visibility of INTA and can attract further international funding. A list of the publications is provided in Annex 4.

Although the second result, the formulation of a national biotechnology strategy did not materialise, the project has made an important contribution to general awareness on this subject, and allowed for initiation of the first national plant breed improvement project (beans). The main instrument of awareness raising has been the organisation of two scientific international congresses on this topic, of which particularly the second increased awareness of the potential of biotechnologies. So far the critical mass has not yet been there to make things move, but this is likely to happen in the near future in the context of two factors. The first is the important investment of donors, particularly but not exclusively of the Inter-American Development Bank, in this sector. The second is the need to guarantee traceability and phytosanitary and zoosanitary safety, imposed by free trade agreements, mainly the CAFTA-DR and the Association Agreement with the European Union, recently ratified by the Nicaraguan National Assembly. A third one could be added, that of the fight against genetically modified organisms and hybrid seed, which is one of the policy areas of the Nicaraguan Government. The reason for not having approved the two law proposals facilitated by FAO and presented to the Parliament at the time when the project started seems to have been the lack of leadership, and institutional competition between MAGFOR and INTA during the new Government (though this competition is traditional and historic). However, as the donor pressure to advance in this field is so strong, the sub-sector of agricultural biotechnologies is bound to advance in Nicaragua but it could be feared that future initiatives might remain donor driven.

4.3 Efficiency

4.3.1 Project budget used in Finland

As was pointed out in the Inception Report, a difficulty in this evaluation has been how to analyse efficiency. Most of the project budget has been spent in Finland, meaning that the chosen project set-up was not the cheapest way of producing the outcomes of

[2] After the sudden decision of Finland in early 2012 to end bilateral cooperation with Nicaragua, a separate project funding was approved for the two doctoral students to finalise their PhD degree studies at the UH, as had been foreseen in the original project plan of two phases of NIFAPRO.

the project. In addition, NIFAPRO can be seen as tied aid, and normally the tying of aid is considered a problem and is censured by OEDC-DAC guidelines: the best practices of development cooperation recommend that as high a percentage as possible of aid is used in the target country, not in the donor country.

The approach taken to tackle this issue in the evaluation consisted of two questions. The first is if the same results could have been achieved at a lower cost, and the other, if there were (are) some additional benefits of having made a project of this instead of just funding scholarships to Finland for ten Nicaraguan students.

Besides the scientific congresses organised in Managua, the rest of the budget of approximately 700,000 € has been spent on the students (including travel, insurance, monthly allowance, language courses, special tuition and administration costs for the University etc). This means that each Master's degree has cost about 60,000 €. This is probably more than a non-EU student would have to pay for a two-year MSc degree course. It could be estimated that the yearly investment for studying in Finland, including travel, insurance, board and lodging, would not exceed 20,000 € (besides some specific degree programmes, there are no tuition fees in Finland – so far). On the other hand, it is possible, almost certain, that there would have been desertions and failures, had the scholarship system not formed part of a project tied within an institution in Nicaragua and the connections of it with the University. This was implicitly recognised by the faculty staff when they talked about "their" "project students" and admitted that the NIFAPRO students have been a source of extra efforts compared to regular foreign, particularly non-EU, students enrolled in the MSc programme in English, most of whom are from more privileged family backgrounds. The modality of project created a kind of identity framework for all concerned parties and probably heavily increased the commitment of the students – and of INTA and of the UH.

Furthermore, if one takes into account the body of research literature and results produced within the context of NIFAPRO, the balance is even more favourable compared to a simple scholarship programme.

Summing up, it is probable that without a project, the results of ten university grants would not be as good as when "baked" within a project, although the per unit cost per student is higher than in a system of scholarships that would not take into account the funds needed to do research in agricultural biotechnologies (due to the use of expensive devices to extract and multiply genetic material and analyse it). On the other hand, the project budget has not only produced ten degree graduates but other results, too, such as contributing to policy debate at the national level, research results and publications, the exchange of Finnish students to Nicaragua, and human resources for the Nicaraguan state who are actually working in a public institution and who can help to carry out the national biotechnology strategies funded by different donors.

4.3.2 Finnish added value?

Although one cannot put a price on policy debates, it would not be an exaggeration to argue that the same results could not have been achieved with a much lower expenditure. But the question of efficiency (cost efficiency) can be approached from yet another angle. All interviewees in Nicaragua were asked if it was justified to send the students to Finland, as compared, say, to Mexico or Colombia where high levels of expertise in biotechnology could have been reached.

The responses were unanimous: the advantage of having studied in an internationally recognised university in English was worth the money spent. Studies in a regional university would not have made the same impact in learning; the students had to be sent "where knowledge is produced, not only applied" in the words of one interviewee.

The students gained in language proficiency, academic networking, they publish articles in scientific journals on topics that never before have been dealt with in academic writing – these are some of the factors mentioned. There seems to be a definitive added value of having sent the students so far away from home.

But what about the Finnish value added? The evaluation has tried to analyse what, if any, has been the specific Finnish value that no other country could have offered – as compared to sending the students, say, to Uppsala or Wageningen, renown agricultural universities. According to the latest world universities ranking list, the UH is number 20 in agricultural sciences, and third in ranking in the Nordic countries. It has nothing to be ashamed of but it is not certain that the lectures, laboratory, library and study facilities would be so much superior to most high-level European or Nordic universities. Not even the pedagogical component is particularly prominent in Finland; some other universities in Northern Europe practice exclusively problem-based learning methods or those based on constructivist approaches in all curricular activities.

After careful thinking there is one specific sphere where Finnish university education compares positively to most other countries. This is the high degree of facultative courses as compared to compulsory study blocks. In the case of these Nicaraguan students at least, the obligation (and the freedom) to choose from a large variety of optional courses has aided in the learning shock experienced by them and contributed to the overall motivation and commitment with the project.

If we define Finnish added value in a slightly different way, an additional contribution is that the CNIA laboratory work is organised much along the lines research teams work in Finland; this is how the NIFAPRO students learned to organise their work while studying at the UH.

4.4 Impact

In the reconstructed logical framework above (3.3), the project's development objective was found to be "Capacities of Nicaraguan national agricultural institutions improved, to contribute to fight against poverty and enhance the competitiveness of the agricultural sector", according the Project Document. While a certain success concerning the first part of this objective can be said to have been achieved, it is premature to claim any progress in the second part. For a project that ended only three months ago, it is impossible to estimate any impact in this sense. So far NIFAPRO has produced outputs (e.g. MSc degrees) and results (graduates working at INTA laboratory, a body of research results and publications, a seed improvement programme for beans has been initiated and testing methods for plant pathogens have been developed, among others). There is a great potential impact in improved seeds and reduced pathogen levels, leading to increased harvests, but none of this has so far materialised: there simply has not been enough time for that. Even less time if the objective is defined in terms of poverty reduction.

As an example of potential economic impact the evaluation chose the case of cacao, a relatively limited crop in Nicaragua and therefore easy to estimate – for some other crops, particularly the staples beans and maize it would have been frankly impossible to estimate impact of improved seeds or reduced plague levels. In addition, the example of cacao is relevant because pathogens affecting the plant are the research topic of two of the NIFAPRO graduates working at INTA.

According to an interview with INTA staff members in Nueva Guinea, the area under cacao farming in Nicaragua is between 15,000 and 20,000 *manzanas* (between 10,500

and 14,000 hectares), and the average harvest per *manzana* is 5 *quintales* (230 kg[3]) at the current level of plagues. Particularly a fungus known as *munilla* (Lat. *Monilia roreri*) is responsible for 80% of harvest loss; in total different fungi produce up to 50% reduction in harvest levels. If the current income from cacao farming is 250 million NIO (Nicaraguan córdobas, slightly over MUSD 10), harvest could double if the fungi were controlled by improved farming methods. This would bring an additional income of over MUSD 10 to cacao farmers in Nicaragua, as the price of a quintal (46 kg) at the place of production is about USD 100. In fact, it would be easy and cheap for INTA to provide short training courses on correct farming techniques because some of the students do research precisely on pathogens of cacao. An investment, say, of USD 2,000 from INTA in a training course in Nueva Guinea, could bring about a significant increase in harvests and produce income ten or even one hundred times the investment.

4.5 Sustainability

The sustainability of what has been achieved depends on INTA in the first place and on the whole agricultural public sector in the second. The graduates are salaried employees of INTA and are motivated by research and the intellectual satisfaction this produces. On the other hand the working environment is not optimal. The students are vacillating between the desire to do research and remain in the only research laboratory of this field in the whole country, and the impulse to flee the centrifugal pressure created by the discouraging working environment and low salary level. The reason for the lack of institutional encouragement seems to be intellectual isolation due to a field of expertise that the rest of staff does not really understand. On the other hand, it is probable that the heavy investment of other donors in the sector in the current and coming years will be a guarantor of some sustainability, with the risk of sustainability being donor driven.

The dilemma between wanting to stay and being discouraged in their work makes some of the NIFAPRO graduates count months to fulfil their engagement with INTA. Some of them may have demand on the job market in the private sector but there are limitations to the attractiveness of the private sector too, as international seed firms do not have research divisions in Nicaragua and few commercial staple farms can afford to employ an MSc degree holder to improve productivity. Food safety control (including seed certification) at the DGPSA of MAGFOR would be a natural choice to host the graduates but even there the human resource created would partially be underutilised, as DGPSA does not carry out (experimental basic) research but diagnoses only. The NIFAPRO graduates do not seem to be eager candidates for emigration; no doubt the employment contract with INTA – with all its possible limitations – has reduced the chances that the graduates envisage emigration within the near future. For this reason, it can be argued that the “sandwich model” and the guaranteed job contract with INTA have greatly increased the sustainability of NIFAPRO. In consideration of the sector dynamics in Nicaragua in these years, it is most probable that the NIFAPRO graduates have demand for their skills if not at INTA, then in some other donor project.

Furthermore, the national seed programme, initiated by the Nicaraguan Government in 2009, in which INTA’s involvement in seed improvement is important, is not itself sustainable because the price at the market of the registered or certified seeds is below production costs (Bonilla 2009). However, this might be considered the price to pay for improved harvests through better, registered seed.

[3] Corresponding to about 326 kg per hectare (1 ha = 1.42 *manzanas*).

4.6 Cross-cutting issues

As far as gender equality is concerned, this time females were the majority: 70% of the students were female. In Nicaragua as in many other countries in this century, female educational attainment is higher than male. The selected doctoral students are two, one male and one female. No gender preferences were given in the selection process but girls just fared better. On the other hand the two persons abandoning the programme are women.

Concerning the cross-cutting issue of preparedness to climate change and reduction of environmental vulnerability, biotechnological methods through genetic markers are an instrument to improve plants to better resist more humid conditions in global climate change which may increase the number of tropical storms in Nicaragua. The project has prepared ten Central American young professionals with skills to tackle this issue. The particular areas where improved seed can be used to fight harvest loss are fungi control, seed borne pathogen detection and elimination and study and selection of native varieties resistant to changing conditions, through mapping of genetic variation. The first domestic bean breeding programme in Nicaragua has been started by one of the trainees. The degree to which the project really contributes to this cross-cutting issue will be seen in the future; at least it created human resources to address it.

The project has proved to promote meritocracy – thus upward social mobility. All except two (eight out of ten) of the students, now graduates, come from families not particularly wealthy, rather lower middle class or lower backgrounds. It was a correct decision not to require previous English proficiency because it would have been discriminatory by social class in Nicaragua. The end result is that the project has offered eight persons of limited financial resources the possibility to study abroad in Europe and to improve their labour market position through an MSc degree to which they otherwise would not have had the means, and in addition to contribute to their country's development.

The other standard cross-cutting issues are less relevant to NIFAPRO: it has not been a democracy, good governance or human rights project, although it has great potential in one particular human rights related issue, food security and the right to food. The three questions in the TOR on cross-cutting issues are only marginally relevant to the evaluation and the response to them is no: there has been no disaggregated baseline data, no particular resources allocated for the promotion of the cross-cutting issues, and cross-cutting objectives have not been systematically and explicitly integrated in the programme. In spite of this, NIFAPRO has ended up working in favour of most cross-cutting objectives of Finnish development cooperation.

4.7 Special issue: Arrangements of Higher Education Institutional Cooperation

The TOR of this evaluation suggest that the results of this evaluation could be used by the MFA and the Embassy of Finland in Managua for planning future cooperation in Nicaragua and in the Central American region. Particularly institutional cooperation between universities and other governmental bodies has been identified as one of the areas of future cooperation between the countries. The TOR have seemingly been drafted before the decision was made to close down the Embassy in Managua at the end of 2013. However, independently of the existence of an embassy in the region, there seem to be little possibility to repeat an experience such as NIFAPRO in the light of these instruments.

As of 2010 Finnish universities are no more legally part of the State, therefore the "normal" instrument for institutional cooperation (ICI), similar to the institutional twinning arrangements of the EU, is not applicable in the case of the universities. This instrument has particularly been used by institutions such as the Finnish Meteorological Institute or Finnish Environment Institute in cooperation with their counterpart institutions in developing countries. Instead of the "traditional" ICI, a new instrument called Higher Educational Institution ICI (known as HEI-ICI) was designed for universities and polytechnics (also called universities of applied science). The latest call for applications of HEI-ICI 2012-2014 states:

> *The HEI ICI Programme funds cannot be used to support academic or applied research or higher education exchange. Provision of commissioned training offered in Finland and support to individual students or the acquisition of a degree in Finland cannot be financed. ..Education components given in Finland exceeding the length of one month per year per student cannot be financed from HEI ICI funding.*

(HEI-ICI Programme Document 2012-2014, p. 9)

The message seems clear: the main component of NIFAPRO, degree studies of Nicaraguan students at a Finnish university, is excluded. The other available instrument, North-South-South cooperation of institutions of higher education is similar in conditions and requirements, although scholarships of up to one year for incoming students (i.e. from the South) are permitted, and this instrument too is limited to cooperation between universities only, and priority is given to Finland's long-term partner countries of which Nicaragua no more forms part. At first glance, NIFAPRO has been an exceptional hybrid case of institutional cooperation between a Finnish university and a state institution in the global South. If NIFAPRO is considered a kind of "pre-ICI" as was told to the Evaluation Team by the MFA both in Helsinki and at the Embassy, the conclusion was logical: within the existing higher education instruments of Finnish development cooperation there is no possibility to replicate this experience.

But this means forgetting the essential point: NIFAPRO was not designed for nor motivated by inter-university cooperation, its objective was not the capacity building of higher education institutions; rather it was a complementary component in the form of a project in the context of a multi-donor sector programme, PRORURAL, and a rather successful one as such. This fact seems to have been forgotten along the way by the MFA staff, and NIFAPRO has lately been regarded only as a perverted form of ICI or HEI-ICI, not as a project that it was. The reasons for this oblivion are not known to the Evaluation Team but they may have to do with the prominent role of the UH in the project, with the donor-government relations in the implementation of PRORURAL, or with the turn-over of staff at the MFA, both in Helsinki and at the Embassy.

5. Conclusions and Recommendations

It is only by taking NIFAPRO as an additional and complementary component in the form of a project in the context of a sector programme that one can do justice to it. Seen in this light, NIFAPRO can be judged as a well designed and successful project. The factors to be highlighted are the following:

- Coherence and complementarity: NIFAPRO has been coherent and complementary with regard to a joint-donor sector programme and with Nicaraguan national policies, despite lowered ownership after 2007 which, however, has not greatly affected the implementation of the project and now is probably growing at the initiative of a national science and technology policy and a significant financial support of donors (IADB loan of MUSD 40 plus others).

- Efficiency: NIFAPRO has produced ten Master's degrees at a cost slightly superior to what would be the standard expenditure for ten university degrees, but with a higher success rate than would most probably have been the case with a simple scholarship programme. The project has increased commitment by offering an identity framework and by securing a job after graduation. Most probably this aspect too compares well with a scholarship system where emigration, brain drain and/or unemployment after graduation tend rather to be the rule than the exception.

- Effectiveness and sustainability: as compared to research capacity building without a project and sector programme context, NIFAPRO shows higher levels of effectiveness. Not only are the degrees obtained in full but the graduates are working in a state institution in a laboratory which despite some limitations is functional and allows doing relevant research. The graduates are publishing in academic journals and networking internationally; and the international agricultural biotechnology congresses have raised awareness at the national level about the possibilities and dangers of biotechnology. Furthermore, the human resource is there to help carry out the national agricultural, productivity and science strategies with the funding of donors which may turn out to be a further guarantee of sustainability.

From this angle, it is not strictly speaking true that NIFAPRO does not fit any of the existing development cooperation instruments, although the project does not fit the future budget frames and cooperation modalities of Finland in Central America. There is nothing in the Paris Declaration or the Accra Agenda of Action that would exclude projects to be designed as complementary and additional support to sector programmes or even to general budget support. The above is valid unless the MFA has decided that all university cooperation with developing countries has to fit into the frame of HEI-ICI or North-South-South cooperation, which in fact would seriously limit the diffusion of Finnish scientific know-how. The reason is that the projects funded through these instruments tend to concentrate on the outer "packaging" of scientific knowledge (teaching methods, curriculum development, production of didactic material and higher education managerial issues) instead of the production of academic substance-matter knowledge itself which is explicitly excluded from MFA funding.

If such a decision has not been made, the modality of NIFAPRO can be recommended to other regional units and departments at the MFA under certain conditions:

- The existence of a well-functioning sector programme funded by several donors;
- The existence of incipient physical and human research capacity and/or policy planning in the partner country at a state institution while at the same time the local universities are not yet up to the task to provide the human resources needed;
- There is academic excellence in the field of the sector programme in Finland and a Master's or doctoral degree programme in English at a Finnish university; and
- The sector is dynamic in the partner country with strong political commitment towards the sector and future initiatives that could take advantage of the created human capacity are envisaged.

This modality is naturally not limited to life sciences only but could be used in other sectors, too. Some examples could be education (e.g. in Nepal) with human capacity development in pedagogical research (including teacher training), or information and communication technologies.

One particularly important recommendation could be made to INTA and other governmental agricultural bodies in Nicaragua: the NIFAPRO graduates could be used even to generate income to the institution if their expertise and services are sold on the market of consultancies in agriculture (e.g. selling training courses). The Evaluation Team ignores if this is legally possible in Nicaragua but the idea certainly deserves a serious thought from the part of INTA: how to take full advantage of the trained human capacity within the institution.

Annex 1 Documents consulted

Ayuda de Memoria. Comité Extraordinario del Programa NIFAPRO. Comité disciplinario para caso de estudiantes. 3.8.2011.

Barrios, Carlos Antonio. Mid-term Evaluation of the "Nicaragua-Finland Agro-biotechnology Program" – NIFAPRO, 4 November 2009.

Bonilla Bird, Néstor 2009 *Estudio de mercados de semilla certificada para Nicaragua y Centroamérica: Análisis de componentes involucrados en los procesos productivos. Análisis del sistema nacional de producción y certificación de semillas certificadas de granos básicos para la comercialización de semillas certificadas en los mercados locales y en Centroamérica,* Managua: FUNICA; at: www.funica.org.ni (visited 20.2.2013).

Contrato de Maestría en Biotecnología en la Universidad de Helsinki-Finlandia, 6.4.2010. Escritura Pública.

Convenio Específico de Cooperación Científico-Técnica en el área de la Biotecnología entre la Universidad Nacional Agraria y el Instituto Nicaragüense de Tecnología Agropecuaria. 2.2.2005.

HEI-ICI Higher Education Institutions Institutional Cooperation Instrument: Programme Document 2012-2014, Ministry for Foreign Affairs, June 2012; at http://www.cimo.fi/instancedata/prime_product_julkaisu/cimo/embeds/cimowwwstructure/24964_HEI_ICI_PD-FINAL.pdf (visited 19.2.2013).

HEI ICI Project receiving funding 2013-2015, at http://www.cimo.fi/instancedata/prime_product_julkaisu/cimo/embeds/cimowwwstructure/27806_HEI_ICI_FUNDING_LIST_2013.pdf (visited 21.3.2013).

HEL7764-29. The Nicaragua-Finland Agro-Biotechnology Program (NIFAPRO); Amendment 1 of Assignment signed on March 5, 2007; extension of contract period until December 31, 2012. 3.7.2012.

Memorándum de Entendimiento, Finland-MINREX-INTA, 19 December 2007.

MGU7057-19. NIFAPRO-hankkeen vuoden 2012 toiminnasta. 27.08.2012.

MGU7057-25. NIFAPRO-hankkeen vuoden lopun toiminnasta ja jäljelle jäävien varojen käytöstä. 17.12.2012.

MGU7057-27. NIFAPRO-hankkeen tilanteesta lokakuussa 2011. 24.10.2011.

MGU7057-28. NIFAPRO-hankkeen päättämisestä sekä uusista yhteistyömahdollisuuksista. 19.12.2012.

MGU7057-30. NIFAPRO-hankkeen vuoden 2011 toiminnasta; kansainvälinen agrobioteknologian kongressi. 26.10.2011.

MGU7060-4. Nicaraguan NIFAPRO-hankkeen vuoden 2009 toimintojen yhteenveto. 12.1.2010.

North-South-South HEI Network Programme. Programme Period 2013-2015: Priorities, changes and selection criteria, at http://www.cimo.fi-a.innofactor.com/instancedata/prime_product_julkaisu/cimo/embeds/cimowwwstructure/27329_NSS_application_round_2013.ASu.pdf (visited 21.3.2013).

Outline Project Document: The Nicaragua-Finland Agro-Biotechnology Program NIFAPRO. Phase I, 2007-2012. November 23, 2006.

Steering Committee meeting Minutes 10.5.2012.

Steering Committee meeting Minutes 24.2.2011.

Steering Committee meeting Minutes 3.3.2008.

Testimonio: Escritura número veintisiete: Contrato de capacitación en el idioma inglés (carta notarial). 3.8.2007.

Annex 2 Persons interviewed

Ministry for Foreign Affairs

Kristina Andersson	Unit for Latin America and the Caribbean, Team Central America
Hannu Ripatti	Unit for Latin America and the Caribbean, Team Coordinator
Eeva-Liisa Myllymäki	Chargée d'Affairs a.i., Embassy of Finland
Salvador Tapia	Advisor, Rural Sector, Embassy of Finland
Nadia Prado	Assistant, Rural Sector, Embassy of Finland
Eeva Helminen	Consul, Embassy of Finland

Ex Advisors MFA, interviewed in Helsinki

Tiina Huvio	Counsellor Rural Sector 2005-2008, Embassy of Finland
Pekka Muuttomaa	Counsellor Rural Sector 2008-2012, Embassy of Finland

University of Helsinki

Jari Valkonen*	Professor of Plant Pathology, NIFAPRO project leader
Helena Korpelainen*	University lecturer, Plant Breeding (MScPPS study director)
Paula Elomaa*	Professor of Horticulture (MScPPS study director 2006-2011)
Viola Niklander-Teeri	International student coordinator, adjunct professor
Esko Koponen*	Central Administration, International Student Affairs
Meri Ojanen	MSc student (visited Nicaragua and INTA in 2010)
Noora Nordenstedt	MSc student (visited Nicaragua and INTA in 2010)
Layla Höckerstedt	MSc student (visited Nicaraguan and INTA in 2012)
	*Members of the NIFAPRO Steering Committee

In Nicaragua

Amanda Lorío	Deputy Minister, MAGFOR
Claudia Tijerino	Director of External Cooperation, MAGFOR
Silvio Palacios	Secretary General, MAGFOR
Lourdes Prado	Technical Department, MAGFOR
María A. Machado	Deputy Minister, MEFCCA
Leyra Bucardo	Director, Research and Market Linkages, MEFCCA
Roberto Araquistán	Deputy Minister, MARENA
María Isabel Martínez	Executive Director, INTA
Danilo Montalván	Director of External Cooperation, INTA
Aldo Rojas	Ex Director of INTA-CNIAB and ex Coordinator of NIFAPRO
Eva Acevedo	Ex director of INTA 2010
Oswalt Jiménez	Acting director INTA-CNIA; NIFAPRO graduate, PhD student UH
Delfia Marcenaro	Director a.i. INTA-CNIA; NIFAPRO graduate, PhD student UH
Andrea Zamora J.	NIFAPRO graduate, INTA-CNIA
Donald Juárez G.	NIFAPRO graduate, INTA-CNIA
Edwin Aragón	NIFAPRO graduate, INTA-CNIA
Claudia V. Rivera	NIFAPRO graduate, INTA-CNIA

Annex 3 Terms of Reference

The Final Evaluation of Finland's Bilateral Programmes in Rural Development Sector in Nicaragua

The bilateral programmes between Finland and Nicaragua are ending by the end of the year 2012. The final evaluations of the programmes are conducted in three thematic areas covering several programmes. One of the theme areas is Rural Development.

1. Background to the final evaluation

Rural development has traditionally been a priority sector of Finnish development cooperation withNicaragua. Over the years there have been a number of important projects implemented mainly inRegion V (Boaco and Chontales) such as PRODETEC (1990-1994) in agricultural technology,PRODEGA (1989-2003) in milk and dairy production, FADES (2000-2003) in local economies,PROCAFOR (1990-2002) in regional forestry, NICAMUEBLE (2001-2004) in carpentry, PANIF (1996-2000) and PROAMBIENTE (2000-2004) on environmental issues and more recently FOMEVIDAS (2006-2011) in rural poverty reduction, support to sectoral programme PRORURAL (2006-12),NIFAPRO (2006-12) in agro-biotechnology and PROPEMCE (2009-12) in rural value chains.

Finland is in the process of transition of its cooperation in Nicaragua and is completing its traditionalbi-lateral cooperation. As a part of this process there is a need to carry out evaluations of some of thekey programmes in rural sector. Due to the same timing and context, as well as similarities in thematicfields and programme/project actors, the three evaluations which are due this year (final evaluation ofPROPEMCE, final evaluation of NIFAPRO and ex-post evaluation of PRODEGA), have been brought together under a single contract. This is expected to result in more efficiency and benefits whenanalyzing the findings, as the two evaluations can be carried out during the common field work andthe evaluation teams can contribute to each other's learning processes. However, each of theevaluations has its respective Terms of Reference and separate reports must be delivered. This text consists of the specific Terms of Reference for the of NIFAPRO programme.

The NIFAPRO Programme (Nicaragua-Finland Agro-biotechnology Programme,) also called the"Agro-biotechnology Human Resource Training Programme" by the Nicaragua Public Investment System commenced in August of 2007 and ended in 2012, with an allocated budget of 716,650 Euros. The Programme was designed based on the research and extension priorities and systems of INTA (The National Institute of Agricultural Technology) with the academic and human resource training capacities of the University of Helsinki (UH). This model was chosen in order to strengthen the government's ownership of agro-biotechnology and to forge an alliance with the University in terms of technical and human training. Another goal was to facilitate the process of creating an applied research programme. Another important actor was The National Agrarian University (UNA) and the Ministry of Agriculture and Forestry (MAGFOR) which played a significant role in the implementation of the NIFAPRO Programme, as a member of the decision-making team. The Ministry for Foreign Affairs of Finland may consider NIFAPRO a pilot programme, and has since established official instruments to facilitate cooperation between the government institutions and the universities.

1.1. Programme context

The 2009-2011 National Human Development Plan (NHDP) determines how the Government of Nicaragua will direct its efforts to decrease poverty and increase economic growth. NHDP places great importance on production and employment for generating food security and economic growth, complemented by actions that will help improve those state services that facilitate production, in the process creating a favourable private investment climate, strengthening infrastructure and maintaining clear and stable economic policies.

The Inclusive Sectoral Programme PRORURAL (2010-2014) is compatible with the objectives set forth in the NHDP. The political guidelines for productive rural development are principally derived from three great challenges: Poverty reduction, achieving food security and sovereignty and capacity building. There has been an increase in the importance assigned to capacity building by recent government policy. The Government has recognized the need for efficiency and quality in their programmes and provision of services. The free trade treaties (CAFTA and the EU Association Agreement) and other international conventions have increased the need for specific studies and services related to the food safety.

Furthermore, Central America is one of the areas most affected by global climate change, which, together with the phenomena of El Niño/La Niña, result in drastic climate conditions such as droughts or excess rainfall. Such is the case, that in 2009 the Government of Nicaragua declared climate change a priority topic to be included in its planning, and even established a food security and sovereignty strategy. It is obvious that climate change poses a challenge to food security and the country needs sophisticated technologies in order to develop plants and varieties that can adapt to the new conditions. Agro-biotechnology is, as in many other areas, an important tool in this endeavour. A proposal for determining agro-biotechnology policy in Nicaragua has existed for more than three years, but remains unpublished. The MAGFOR is the entity responsibly for determining Policy in this matter.

1.2. Description of the programme to be evaluated

The overall objective of NIFAPRO is to build national capacities and competencies in agrobiotechnology and agrobiosecurity and contribute to creating an agro-biotechnology policy in Nicaragua. The purpose is to strengthen the technical capacities of INTA so that they use various technologies to improve varieties, ensure biosecurity and create a biotechnology policy adapted to the Nicaraguan context.

The project is based on so called “sandwich” –model, where students alternate between studies in Finland (and Nicaragua) and work in INTA. The Programme has a management committee comprised of MFA and the Embassy, the University of Helsinki, INTA, UNA and MAGFOR, who, prepare the work plan for the following year. Most of the budget has been spent in Finland to cover the expenses of the Nicaraguan students. In 2008 there was an effort to also promote the south-south cooperation through the university programmes in African countries.

INTA together with the Embassy has worked to reinforce the institutionalization of the Programme at INTA and the PRORURAL sectoral programme. To date, the programme candidates have been able to work in the laboratory at INTA. In 2010, greater coordination was achieved with the seed programme financed by the World Bank, and NIFAPRO was proposed as its human resource development component. INTA’s research strategies are currently under review within the context of the new NHDP and the Inclusive Sectoral Programme PRORURAL.

1.3. Results of previous evaluations

A mid-term evaluation was carried out by a local consultant in 2009, and as part of the process, he organized a workshop to receive feed-back from different stakeholders including the UH staff visiting in Nicaragua. Even though the focus of the evaluation was on the INTA seed programmes instead of evaluating the project, it was nevertheless recommended that NIFAPRO should seek out more cooperation and carry out more networking at a national and regional level in order to improve its impact and sustainability.

2. Rationale, purpose and objectives of the evaluation

Rationale and purpose: The bi-lateral agreement between MFA and the Nicaraguan Government will be completed at the end of 2012 and, according to the development cooperation agreements and administrative procedures; a final evaluation must be carried out. The evaluation helps to assess the results at the completion stage of the project and provides inputs for considering the relevance of this type of assistance under similar conditions. It is particularly valuable to have an outside on the effectiveness, impact and sustainability of the programme, as well as conditions required by this kind of aid modality.

The Nicaraguan Government has prioritized capacity building and the use of more advanced research and development technologies. In this case, the evaluation may provide important information on lessons learned regarding new approaches or methodologies for developing technical and institutional research in Nicaragua and clarify the role of the agro-biotechnology capacity created under the NIFAPRO programme. It should also provide ideas on how to continue the international cooperation in this field.

Use of the results: The results of this evaluation are mainly for Finland's Ministry for Foreign Affairs and the Embassy of Finland in Managua. They will serve to assess the recent development cooperation in Nicaragua, and provide inputs and ideas for considering possible future cooperation in Nicaragua or in the region. The cooperation between the universities and other governmental institutions (ICI) has been identified as one of the potential continued areas of cooperation between the two countries. Likewise, the evaluation could be used by MAGFOR and INTA since they play an important role in developing sectoral policies and strategies, as well as in their implementation.

Finally, the evaluation will benefit other donors supporting Nicaraguan rural sector development.

The **specific objectives** of the final evaluation are to:

(i) Analyze the impact, sustainability and institutionalization of the results of the programme.

(ii) Assess effectiveness and suitability of "sandwich" –model for institutional development and capacity building as an implementation modality.

(iii) Assess the organizational structure and performance of project management processes such as decision making, selection of students, monitoring, delivering value for money and risk management;

(iv) Document general lessons learned and give recommendations based on the Nifapro experiences that can be used at a future date in similar Finnish

cooperation or Nicaraguan development programmes. Special attention should be placed on the institutionalization,
sustainability and application of high level technologies in developing country.

3. Scope of the final evaluation

Time span: 2007-2012

Stakeholder groups (non-exhaustive list);

- Target group / beneficiaries; students who studied in Finland
- Implementation institutions; INTA and University of Helsinki
- Governmental institutions; involved in the management of the programme; MAGFOR, INTA
- Other relevant institutions; UNA, World Bank, UCA
- Private sector institutions; UNAG, Funica, seed production cooperatives, others
- Donor agencies; Embassy of Finland (and MFA) and potential partners (EU, IDB, FAO)
- Geographical area;

Geographical area;

- INTA Managua, INTA at CNIAB
- Local INTA laboratories in Estelí
- Coverage of national seed programme

4. Issues to be addressed and evaluation questions

4.1. Cross-cutting objectives and evaluation questions

This evaluation should place special emphasis on gender, reduction of inequality, human rights and governance issues. Environmental vulnerability, climate change and disaster risks should be taken into account as Central America is probably one of the most affected regions in the world.

The evaluation does not need to focus on HIV/AIDS, as it is not a major development challenge in Nicaragua.

Evaluation questions for the cross-cutting objectives:

- Was adequate and appropriately disaggregated baseline data available on the cross-cutting
  planning, implementation, monitoring and evaluation objectives?

- Were adequate resources and expertise allocated for implementing the promotion of the crosscutting objectives?

- Were cross-cutting objectives systematically and explicitly integrated into programme design, implementation, monitoring and reports?

4.2. Evaluation criteria and evaluation questions

The evaluation will analyse the **relevance** of the programme from the standpoint of national needs and priorities and Finland´s development cooperation policy; to provide an evidence-based **impact** analysis of the project, i.e. how the programme succeeded in the goal of improving "institutional agrobiotechnology development" in Nicaragua. Of special interest is the **sustainability** of INTA's activities and strategy, as well as of the results obtained by NIFAPRO at a national level. Furthermore, the evaluation should provide evidence and analysis on the **efficiency and effectiveness** of the project in developing agro-biotechnology in Nicaragua. The role of the Government of Finland and the Embassy of Finland in Managua as donor and partner will be analysed at the same time.

Relevance

Relevance refers to the extent to which the goals and objectives of the programme are consistent with beneficiaries' requirements, country needs/policies, global priorities and the partners' and Finland's policies.

Problems, needs

- Are the project objectives and achievements consistent with the needs and priorities of the poor people and small farmers in Nicaragua, as final indirect beneficiaries?

- How the objectives and strategies are defined by the different stakeholders such as INTA or UNA, and are they relevant to the needs of the country?

Policy priorities

- Are the programme objectives and achievements consistent with the policies of the partner
  country?

- Are the programme objectives consistent with Finland's development policy?

Efficiency

The efficiency of a project is defined by how well the various activities transformed the available resources into the intended results in terms of quantity, quality and timeliness. These should be compared to the initial projections.

Value for money

- How well did the activities transform the available resources into the intended outputs/results, in terms of quantity, quality and time?

- Can the costs of the project be justified by the results?

- Are INTA and UH suitable/compatible partners for this specific matter? Did UH bring added value?

- In the case of NIFAPRO, what factors contributed most to operational problems and delays?

Development effectiveness

Effectiveness describes results that have contributed to achieving the project objectives. The evaluation is made by comparison with the indicators.

Achievement of immediate benefits

- To what extent did the programme achieve its purpose?
- What is the quality of the capacity building?
- Is there enough national/regional networking taking place?
- Has agrobiotechnology been established as a tool of research and development in Nicaragua?

Development impact

Impact describes how the programme has succeeded in the attainment of its overall objective, i.e. targeted impact for its beneficiaries. The evaluation is made against the related indicators.

Achievement of wider benefits

- What is the overall impact of the project on national agro-biotechnology development, in terms of intended and unintended, long term and short term, positive and negative?
- Do the indicators for the overall objective show that the intended changes have started to take place?
- Did NIFAPRO in any way contribute to the relationships and collaboration between Governmental institutions and non-state actors (universities, private sector, NGOs?)
- Did it contribute to regional and international cooperation or networking?

Sustainability

Sustainability can be described as the degree to which the benefits produced by the project continue after the external support has concluded.

Continuation of the benefits

- Are the benefits produced by the project likely to be maintained after the termination of external support? How committed are the Government, INTA, UH and the scientific community?
- Is there a clear strategy on how Government or other stakeholders use and multiply the human resources developed by the programme?
- Who will take over the responsibility of financing the activities, or have they become selfsustaining?

- Does the Government have a programme that can continue using the human resources
  produced?

Programme management and administrative arrangements

Sound management

- What was the quality of the planning, monitoring and reporting, including the use of indicators by the resource and personnel management and the financial management cooperation? How was communication between NIFAPRO and its stakeholders?

- Has the selection of the students been successful and correctly managed?

- Was the embassy an active facilitator?

Aid effectiveness

- How compatible were the national development plans and the political agenda with those of the private sector organizations?

- Were there any alliances between the universities and governmental institutions and private
  sector?

- How accountable and transparent was the government and the University of Helsinki in its activities?

- Was the implementation model suitable for the project objectives?

Finnish value added

- What was the added value provided by the Finnish support?

- What are the distinctive features of Finland's support?

5. Methodology and reporting

The consultant is expected to combine different methodologies to gather representative, correct and justified information and well-grounded recommendations. The methodology shall be presented in the proposal.

Kick-off meeting: The assignment will begin with a kick-off meeting at the Ministry for Foreign Affairs (MFA) in Helsinki, and the Embassy of Finland in Managua (or jointly via video-conference).

Desk review: The consultant is expected to carry out a desk review based on the documentation provided by the MFA and the Embassy of Finland in Managua.

Inception report: Before field work and on the basis of the desk review, the consultant shall present a detailed and updated work plan, a list of major meetings and interviews planned for the field visits as well as detailed evaluation questions linked to the evaluation criteria.

Interviews and fieldwork: The meeting arrangements and logistics shall be done in close cooperation between the team and the Embassy.

Debriefing: At the end of the mission, the team shall prepare and organize a meeting to present the key findings and recommendations to the Embassy and other stakeholders in Managua or jointly with the MFA via video-conference. A follow-up debriefing shall be organized at the MFA in Helsinki.

Draft report: The draft report in Spanish shall be submitted to the MFA one week after the follow-up debriefing.

Final report: The final report shall be submitted to the MFA two weeks after receiving the commentson the draft report. The final report should be both in English and Spanish.

6. Mandate

The evaluation team is entitled and expected to discuss matters relevant to this evaluation with pertinent persons and organizations. However, it is not authorized to make any commitments on the behalf of the Government of Finland.

Annex 4 Publications produced in the context of NIFAPRO

SCIENTIFIC PUBLICATIONS

(by April 2013)

Jiménez, O., Korpelainen, H., Rojas, A., Elomaa, P. & Valkonen, J.P.T. 2012. Genetic purity of the common bean seed generations (*Phaseolus vulgaris* L. cv. 'INTA ROJO') as tested with microsatellite markers. *Seed Science and Technology* **40**:73-85.

Aragon, E., Rivera, C., Korpelainen, H., Rojas, A., Elomaa, P. & Valkonen, J.P.T. 2012. Genetic diversity of native cultivated cacao accessions (*Theobroma cacao* L.) in Nicaragua assessed using microsatellite markers. *Plant Genetic Resources: Characterization and Utilization* **10**: 254-257.

Martínez-Meyer, M.R., Rojas, A., Santanen, A. & Stoddard, F.L. 2013. Content of zinc, iron and their absorption inhibitors in Nicaraguan common beans (*Phaseolus vulgaris* L.). *Food Chemistry* **136**: 87–93.

MASTER'S THESES

- **Aurora Suarez**. Identification of microorganisms present in the roots of cocoyam (*Xanthosoma sagitifolium* L. Schott) plants showing symptoms of "Mal seco" disease in Nicaragua.
- **Arlen Tijerino**. Molecular identification of elite *Pinus* trees in a forest seed-source in Nicaragua.
- **Leticia Valenzuela**. Evaluation of protein quality in Nicaraguan landraces of maize (*Zea mays* L.)
- **Donald Juarez**. Somatic embryogenesis and short and long term conservation of cacao germplasm (*Theobroma cacao L*).
- **Andrea Zamora.** Detection of viruses in seed potatoes (*Solanum tuberosum*) in Nicaragua.
- **Marcela Martínez.** Content of zinc and iron and their absorption inhibitors in commom beans (*Phaseolus vulgaris* L.) in Nicaragua.
- **Oswalt Jimenez**. Genetic purity of the common bean (*Phaseolus vulgaris* L. cv. 'INTA ROJO') during seed production in Nicaragua.
- **Delfia Marcenaro**. Identification of seed-borne fungi in common beans (*Phaseolus vulgaris* L. cv. INTA Rojo) in Nicaragua.
- **Erwin Aragon**. Genetic characterization of *Theobroma cacao* L. in Nicaragua.
- **Claudia Rivera**. Using microsatellite markers to identify tentatively Nicaraguan cacao accessions resistant to *Phytophthora palmivora*.