Mid-Term Evaluation of the VLIR NETWORK university cooperation Programme in Ecuador (co-ordinated by ESPOL)

vliruos 20 YEARS
SHARING MINDS, CHANGING LIVES

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Table of contents

ACRONYMS

CEAACES	Consejo de Evaluación, Acreditación y Aseguramiento de la Calidad de la Educación Superior
CES	Consejo de Educación Superior
CEDIA	Corporación Ecuatoriana para el Desarrollo de la Investigación y la Academia
CONEA	Consejo Nacional de Evaluación y Acreditación
DGD	Directoraat Generaal Development
EPN	Escuela Politécnica Nacional
ESPOL	Escuela Superior Politécnica del Litoral
INIAP	Instituto Nacional de Investigación de Agro-Precuaria
IUC	Institutional University Cooperation
JC	Judgment Criteria
KU Leuven	Katholieke Universiteit Leuven
LFA	Logical Framework Approach
LOES	Ley Orgánica de Educación Superior
MoU	Memorandum of Understanding
MSc	Master in Science
MTE	Mid-term Evaluation
OECD/DAC	Organisation for Economic Cooperation and Development/Development Assistance Committee
PROMAS	Programa para el manejo del Agua y del Suelo
PSU	Programme Support Unit
R	Result
Senescyt	Secretaria Nacional de Educación, Ciencia, Tecnología e Innovación
SI	South Initiative
ToR	Terms of Reference
UA	Universiteit Antwerpen
UCuenca	Universidad de Cuenca
UGent	Universiteit Gent
UTN	Universidad Técnica del Norte
VLIR-UOS	Vlaamse Inter Universitaire Raad – Universitaire Ontwikkelingssamenwerking
VUB	Vrije Universiteit Brussel
WRM	Water Resources Management

PREFACE

We had the honour of meeting very motivated and engaged people who have shown their commitment for making this Network programme to become a successful pilot. In a highly competitive academic world, programme coordinators, - manager and focal points showed that inter-university collaboration is worth investing in. We would like to thank all people that participated in this evaluation. Special thanks to the programme support unit who did an excellent job in preparing and coordinating the evaluation visit. We wish you all success in the second phase.
Geert Phlix (ACE Europe) Mechelen, Belgium, 2018

EXECUTIVE SUMMARY

Subject of this mid-term evaluation is the Network University Cooperation programme implemented in Ecuador by ESPOL, Escuela Superior Politécnica del Litoral (coordinating university), in collaboration with the Universidad de Cuenca (UCuenca), Escuela Politécnica Nacional (EPN) and Universidad Técnica del Norte (UTN), in partnership with the University of Ghent (UGent – coordinating university), and the universities of Brussels, Leuven, Hasselt and Antwerp, and the Institute for Higher Education Ghent (HoGent).

This Network programme focuses on the development of inter-university or joint master degrees in the sectors of applied biosciences and water resources management, strengthening research-based education and the application of a research-based learning approach. The overall objective of the Network programme in Ecuador is to deliver highly qualified human resources in natural resources management (biodiversity and water resources) and to contribute to the sustainable use and conservation of Ecuadorian natural resources. The total planned budget for the programme phase 1 mounted to 1,5 million EUR. The programme started in 2012 with a formulation phase. The first phase will end in 2018.

A mid-term evaluation was requested at the end of phase 1 in order to contribute to learning, steering and accountability. The evaluation is expected to formulate recommendations to support the decision-making process regarding the second phase of the Network but also to identify lessons learned that can be useful for the development of other VLIR-UOS Network programmes.

The evaluation was executed in the period between December 2017 and March 2018. The evaluation was based on an assessment of the 5 OECD/DAC criteria and an additional criterion on scientific quality. The evaluation was implemented in three phases: an inception phase, a phase of data-collection (including a visit to Ecuador in February 2018) and a phase of analysis and reporting. The evaluators applied a mix of data-collection methods, such as document analysis, semi-structured interviews, focus group discussions and on-site project visits. Principles of outcome harvesting were applied. All four universities in Ecuador were visited.

Relevant programme supporting universities to comply with the national reform processes for higher education

The Network programme is highly relevant for the Ecuadorian context, aligns well to the national policy, the VLIR-UOS country strategy and responds to the needs of each of the universities involved. The programme contributes to further strengthening of the universities in order to comply with national educational reform processes for higher education. Inter-university collaboration was and still is not evident in Ecuador. In a highly competitive academic context, the Network programme has built a good practice in inter-university cooperation, which has the potential to be scaled-up throughout existing inter-university networks and platforms.

The Network programme shows the importance of building further on results achieved through other VLIR-UOS projects, not the least the IUC projects. Within these projects relevant capacity was built (both at educational level and with regards research), infrastructure improved (ICT, laboratories) and international relations and networks strengthened. It appeared easier to mobilise professors and researchers within ESPOL and UCuenca (previously involved in IUC projects), compared to EPN and UTN, to become engaged in the VLIR-UOS network and in particular to engage tenured staff. The VLIR Network programme also implied institutional change processes which were more difficult at EPN and

UTN. A lot of soft diplomacy was required from the Network coordinators and focal points to explain the features and consequence of a Network approach to administrative staff of EPN and UTN.

High level of effectiveness

This VLIR-UOS Network is a very successful programme that has achieved to create a culture of collaboration between the four universities involved. This collaboration enables the implementation of two joint research-based master programmes in biodiscovery and water resources management and facilitates more joint research. Both masters obtained approval from CES, council for higher education, and a process for international accreditation has started. The MSc in applied biosciences has organised already two cohorts with respectively 12 and 18 students, the MSc in water resources management started 6 months later. The 19 students of the first cohort have finished or are about to finish their study and a second cohort will start in September 2018. The development of a joint doctoral programme in natural resources (including biodiscovery and WRM) is an evident following step and will also contribute to the sustainability of the master programmes.

Experience was gained in new models for academic curriculum development and course design, and in the application of research-based learning and the organisation of virtual classes.

The Network programme builds further on previous VLIR-UOS interventions and as such contributes to sustaining the results achieved in these projects. Furthermore, the Network is enhancing the relationships between Ecuadorian and Flemish universities, which can result in more sustainable partnerships. All partners in Ecuador and Belgium have looked for complementary funding to increase staff and student mobility, which resulted in the formulation of new joint research proposals and enhanced participation of master and PhD students and lecturers of different universities in Network activities (even from non-participating universities).

Not much graduated students have found a job yet outside of the university. The majority of the current students and alumni see the master as a step in their academic career. The first cohorts of the master students are above all benefiting the internal capacity development of the universities, which seems very relevant taking into account the need of each university to attract qualified staff with MSc and PhD. It was learned that the absorption capacity of the labour market for high profile candidates is rather limited. The existence of MSc programmes is rather new in the country and companies are not yet used to hire MSc graduates. One of the assumptions of the VLIR-UOS Network programme is that while more MSc graduates will enter the labour market, companies will start realising the benefits of these profiles and start hiring them.

Efficient programme implementation and - management

The Network partners achieved an agreement on the division of the budget over the two projects (two master programmes) and the four universities. Moreover, budget was flexibly managed and transfer of budget between the two master programmes was possible. The programme support unit operated according to high quality standards and in a professional manner. Financial management support was provided by ESPOL-TECH, a private company attached to ESPOL, and a good collaboration between ESPOL-TECH and the programme manager contributed to flexible, efficient and transparent management.

Division of roles and assignment of responsibilities, both in Belgium and in Ecuador, were perceived by all stakeholders as being appropriate and conducive for efficient programme implementation. One bottleneck to be resolved relates to the communication on the programme budget to ensure that every-one

within the Network (both North and South) has a good overview of the current state of affairs, at all times.

Almost all intermediary results have been realised, contributing to achieving the specific objectives, but follow-up of some of the project activities could be strengthened. For example, one of the important features of the joint master programmes is the adoption of innovative educational approaches, such as research-based learning (RBL). Most of the lecturers interviewed are enthusiastic about the approach. The content of each course is regularly evaluated, also taking into account the integration of research. However, there is not much information on the application of RBL by each of the lecturers, and on the coherence between the assignments given by the different lecturers involved in a specific course. The evaluation has shown that not all lectures were sufficiently trained in RBL and that some of them might need additional support or coaching.

Financial sustainability seems to be guaranteed, institutional sustainability still requires more internal lobbying

The MSc in biodiversity is awarded with a five-year approval by CES and a similar approval is pending for the MSc in water resources management. All universities are committed to continue operating jointly, which is formalised in a MoU. Administrative systems and procedures at each of the universities have been adapted to manage well a joint master (with still some minor problems to be solved), and CES authorised ESPOL-TECH to manage the funding of joint master programmes, even after the VLIR-UOS Network programme. However, the implementation of the joint master is confronted with institutional/administrative bottlenecks that are typical for each of the participating universities. The challenge will be to continue this joint collaboration once the VLIR-UOS Network will be finished and no extra funding will be available for coordinating tasks.

The biggest challenge for the continuity of the joint masters is the influx of students. The full-time two-year master programmes are not attractive for many students. Apart from financial bottlenecks, also the length of the study period is a bottleneck. Furthermore, the master does not automatically lead to more (or more rewarding) job opportunities. The fact that Senescyt, the national secretariat for education, sciences, technology and innovation, decided to re-install a budget for national scholarships from 2018 onwards and the fact that the master programmes have been recognised as national priority programmes opens perspectives of attracting more students.

The universities (less so at ESPOL) have more rigid administrative systems, which might hamper mobilisation of sufficient resources internally for coordination and collaboration once the project is finished, but which are required in a joint programme.

A master programme, by law, must be self-financing. It was calculated that 8 students/cohort would be the minimum for the financing of the master, which was largely achieved. The project is currently saving money from the tuition fees of the current students, which will enable the financing of network activities for a certain period.

The Network is used as leverage for attracting other funding, but still mainly from VLIR-budgets. A total of nine research proposals were approved for funding (for more than 1,3 million EUR), of which 8 funded by VLIR-UOS. Several ideas to formulate new research proposals and to look for funding outside of VLIR-UOS are circulating.

Indications of impact – attention now is needed for up-scaling of good practices

Good practice as experienced in the VLIR-UOS Network is limited to the lecturers and faculties involved in the Network programme. There is not much spill-over to other lecturers and other faculties within each university (more so at ESPOL). Only at ESPOL, other research-based masters have been developed. Moreover, administrative staff at departments for postgraduate studies and educational departments have changed since the start of the programme and it is not clear to what extent knowledge transfer has taken place. An upscaling strategy was not foreseen. Monitoring of the application of research-based learning and the use of the virtual classroom can be improved, and more teachers still need to be trained or need refresher courses. Training on research-based learning still depends on the Network activities and budget. Research based learning is not integrated in the learning package for continuous teacher training at each of the universities.

Lobbying CES has resulted in the revision and adaptation of the national regulations to enable the organisation of joint master programmes, the acceptance and even promotion of research-based learning and acceptance of virtual classroom teaching. However, RBL could not be fully applied. CES regulations still focus on a substantial number of hours in class whereas the Network programme intended to find a better balance between theoretical classes and practical classes such as lab and field work.

Several initiatives for inter-university cooperation are being taken in Ecuador but they all lack a facilitator or a driving force.

The collaboration with external stakeholders, both public and private actors is very limited in the VLIR-UOS Network programme so far. This has negative consequences for the impact and sustainability of the programme. Currently there is not much uptake from knowledge gained and practical solutions developed for concrete problems in biodiversity and water resources management, which is understandable as the programme is just about to finalise its first phase.

The labour market has currently limited absorption capacity for students with this high educational profile (see in the above under effectiveness). There are institutions (and individuals) that are eager to invest in specific training and education. However, while the 2 years full-time format of the programmes is good from the university point of view, this format is difficult for most of these institutions.

Recommendations

A second phase will be needed to consolidate the results achieved, maximise sustainability and to up-scale the good practices in order to achieve wider impact. As the national policy on higher education is pushing the universities to develop more research-based master programmes, there is a lot of potential to expand the experiences gained in this programme. A set of recommendations are formulated for the second phase, related to:

- Strengthening the application of research-based learning;
- Continue lobbying for a favourable environment for (joint) research-based master programmes;
- Invest in up-scaling of good practices;
- Invest in establishing contacts with external stakeholders.

Finally, several lessons can be learned from this first Network experiment:

- Basic conditions for high level education and research need to be in place (Lecturers with PhD, research group, research friendly environment), which can be the result of former VLIR-UOS interventions.
- Support and commitment form leadership is required. Within each institution leaders need to be identified that are able to invest time and energy to move the project forward.
- Weaker universities can be included in the Network programme but only when there is commitment of leadership to bring the university to a higher level.
- A lot of soft diplomacy is needed to inform the participating universities on the consequences of a joint programme and act accordingly.
- Sufficient time and budget is needed for getting to know each other; this includes traveling between the universities and investment in group work.
- The development of a master curriculum benefited a lot from the advisory support regarding curriculum development, course design and research-based learning. This is not a specific feature of a Network programme. The advantage of a Network curriculum is the complementary expertise that can be attracted to shape the curriculum. Starting point is not the expertise in one university but the finality of the master course and the needs of the sector.
- The application of virtual classroom teaching is as effective as teaching in real life but requires sufficient training of lecturers and access to reliable equipment and IT connections. It is a solution for distances and costly traveling.

1. Introduction

1.1. Background

1.1.1. General objectives and guiding principles of the VLIR-Network programmes

The Network University Cooperation (Network) aims at national level impact in a specific thematic domain by the provision of substantial support to a limited number of carefully selected partner universities located in a VLIR-UOS partner country. It builds upon the experiences of a former Institutional University Cooperation (IUC) partner which serves as the coordinating university.

A NETWORK focuses less on capacity building and more on harvesting and multiplication of opportunities addressing nation-wide needs in the educational and research area. It focuses on cross-institutional interactions, such as in inter-university curriculum development, joint degrees at Master and PhD levels, links with other networks and links with Flemish universities.

Some guiding principles for a Network programme are:

- Spirit of partnership, dialogue and mutual respect;
- Participation of high level academic leadership is crucial (decision making structures in all involved universities);
- Incorporation into local structures and systems (university, regional/national).

Typically, a Network Programme consists of 5 to 6 years in the first phase. The Network programme under evaluation is one of the first Network programmes supported by VLIR-UOS. This generation Networks had a first phase of 6 years. This Network programme covers a period of 10 years with two phases, a phase of 6 years, from 2013 – 2018 and a second phase of 4 years 2019-2022 aimed at consolidating results of phase one. The Mid-Term Evaluation was requested in the last year of the first phase.

The primary impact envisaged by a post-IUC Network is to contribute to changes through the results of the different projects. A second intended impact is (a) the contribution to an improved performance of the higher education institutions and (b) a changed role of the involved local partner universities as development actors (strongly related to development changes). The inter-institutional national cooperation within a Network strengthens this developmental change even more and brings about a higher proposed level of impact as compared to an IUC.

The coordination of a network programme is delegated to a local academic person (Network Programme Coordinator) affiliated to the local coordinating university (and coordinator) and a Flemish academic coordinator who have the responsibility to manage the implementation of the Network programme and the constituent activity programmes. In the non-hub local partner institutions, the Network programme receives follow-up through a focal point.

1.1.2. Subject of the evaluation

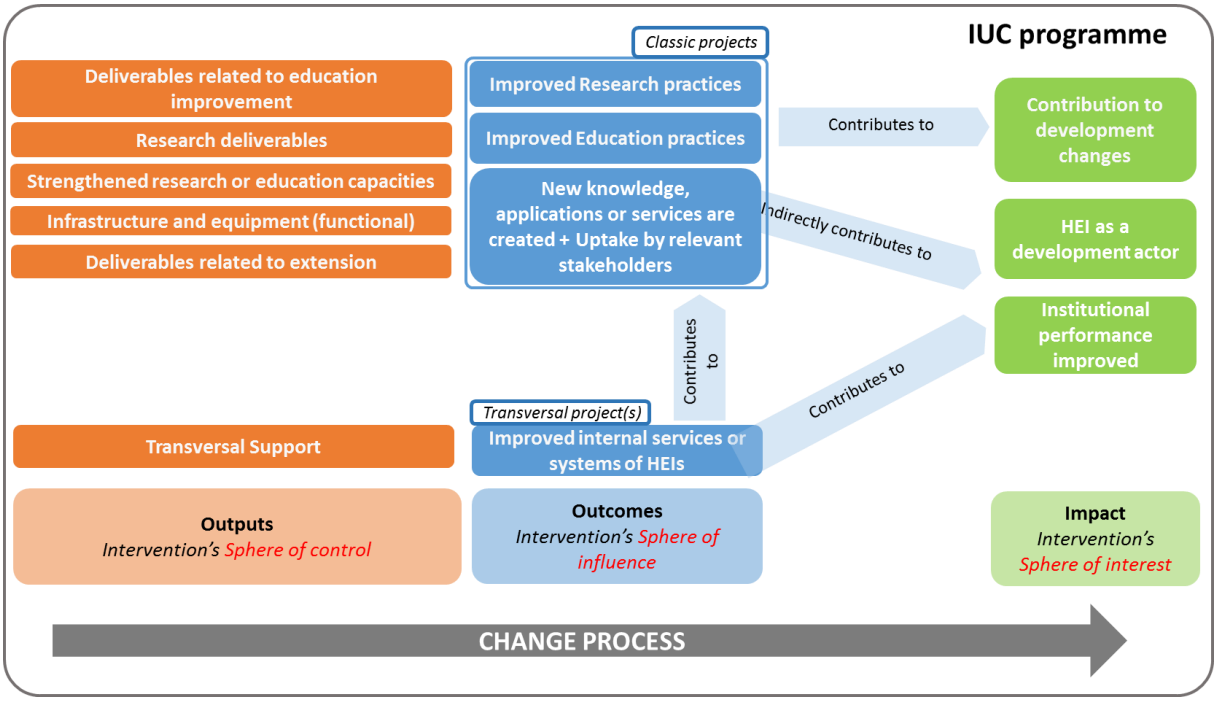
Subject of this Mid-Term Evaluation (MTE) is the Network University Cooperation programme implemented in Ecuador coordinated by ESPOL, Escuela Superior Politécnica del Litoral. In Ecuador, four universities are involved namely, ESPOL, Universidad de Cuenca (UCuenca), Escuela Politécnica Nacional (EPN) and Universidad Técnica del Norte (UTN). In Belgium, the programme is coordinated by the University of Ghent (UGent), and supported by the universities of Brussels, Leuven, Hasselt and Antwerp and the Institute for Higher Education Ghent (HoGent).

The Network University Cooperation aims at national level impact in a specific thematic domain, in this case biodiversity, by the provision of substantial support to a limited number of partner universities. It builds upon the experiences of one of the former institutional university cooperation partners, in this case ESPOL, which is serving as the coordinating university. The Network programme focuses on strengthening cross-institutional interactions, such as inter-university curriculum development, joint degrees at master and PhD level. In Ecuador, the Network programme aims at developing research based joint master programmes, namely one joint master degree in Biodiscovery and one joint master degree in Water Resource Management (2 projects).

A generic Theory of Change for the Network Cooperation programmes is developed, which summarizes the expected output, outcome and impact of the supported change processes. Output refers to deliverables related to education improvement, research deliverables, strengthened research or education capacities, improved infrastructure and equipment, and deliverables related to extension. These outputs are assumed to contribute to outcomes related to improved research practices, improved education practices and new knowledge, applications or services that are also taken up by relevant stakeholders. In the long term, the Network programme aims at contributing to development changes. Within the Network cooperation programme in Ecuador focus is put on the outcome referring to improved education practice (with a specific attention to curriculum development, strengthening research-based education and a student-centred practice). Compared to IUC programmes, less emphasis is put on strengthening research and research capacities. By consequence less budget is attributed to PhD scholarships.

The below presented generic and simplified programme level ToC for an Institutional University Cooperation programme in fact also applies for the post-IUC Networks. However, the transversal support domain will not be necessarily implemented through transversal projects. In some cases, this transversal support is embedded in the administrative Programme Support Unit.

Figure 1: Generic Theory of Change (ToC) of the VLIR-Network Programme



The overall objective of the Network programme in Ecuador is to deliver highly qualified human resources in natural resources management (biodiversity and water resources) and to contribute to the sustainable use and conservation of Ecuadorian natural resources (biodiversity and water resources).

Following table presents an overview of the 3 projects constituting the Network programme with its specific academic and development objectives.

Table 1: Overview of the specific academic and development objectives for each of the Network projects

Projects	Academic objective	Development objective
Bio-discovery	A research-based joint Master's programme in biodiscovery developed	Improved understanding and use of biodiversity through research-based master programme delivering professionals, which will allow developing solutions for practical problems of the Ecuadorian society through the sustainable use of natural resources.
Water Resources Management	A research-based joint Master's programme in water resources management developed	Enhanced local capacities for sustainable use of water resources management by delivering highly trained local professionals on WRM, which will allow developing solutions for practical problems of the Ecuadorian society through the sustainable use of natural resources.
Programme Support Unit		

1.1.3. Objectives of the evaluation

The MTE needs to contribute to Learning, Steering and Accountability. The MTE is expected to identify lessons learned that will inform the second phase of the on-going Network but that also will contribute to enhancing the quality of future Network programmes (learning). The MTE is expected to formulate

recommendations to support decision making processes regarding the second phase of the Network (Steering). The evaluation also needs to collect data to account for the results towards the different stakeholders (Accountability).

The evaluation needs to evaluate the performance of the Network Cooperation at programme and project level based upon the 5 OECD criteria + an additional criterion on scientific quality. A particular focus needs to be given to the evaluation of the effectiveness and efficiency. Also, the follow-up plan of the programme for the second phase needs to be evaluated.

Next to these standard objectives, the ToR also has formulated two specific evaluation questions, namely:

1. The Network programme aimed at bringing former IUC cooperation to a next level of national (and even) international inter-university cooperation around a priority theme. How do you consider the level of contribution given to this level of change/development?
2. Have the partner universities taken ownership of the Network programme?

1.2. Context

1.2.1. Political, economic and demographic contextual factors

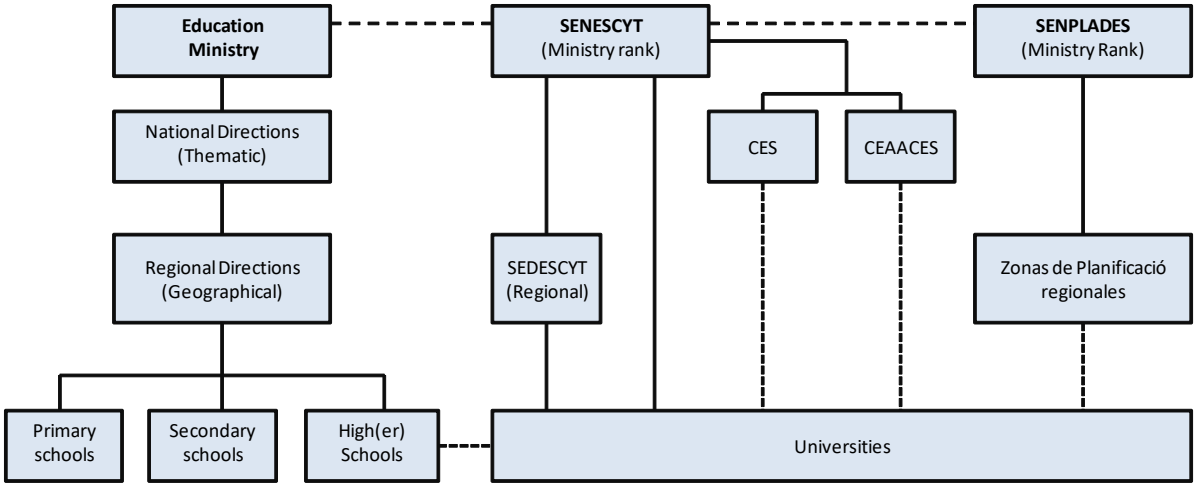
Ecuador is located in the North-West of South America. It covers 256,370 km^2 and is very biodiverse. Ecuador has four major regions: the coastal area (Costa) with tropical lowlands along the Pacific Ocean; the Andes region (Sierra) with a mountain chain running from Colombia to Chile; the Amazon Region (Oriente) with a tropical jungle and lowlands, and the small insular Galapagos islands. The four universities participating in the Network programme are located in three of the four regions: Costa (ESPOL), Sierra (EPN and UCuenca) and Oriente (UTN). The official language is Spanish, but Kichwa (Quechua) and Shuar are now being recognized as official languages for intercultural relations. Although the country is now considered to be a middle income country, the inequality is still very high with high poverty rates.

President Rafael Correa-Delgado and Vice President Lenin Moreno were in power since 15 January 2007. At the last election of 2017 vice president Lenin Moreno was elected as the new president. Correa's administration tried to reduce the high levels of poverty, indigence, and unemployment. To achieve these objectives an ambitious "National Development Plan for Good Living 2009-2013: Building a Plurinational and Intercultural State", known as "Plan del Buen Vivir", was developed by the Secretaría Nacional de Planificación y Desarrollo (SENPLADES, 2010). Linked to this, transformations in the (higher) education sector were implemented in the wish of making Ecuador a 'country of knowledge'.

1.2.2. Educational context

Higher Education is provided by universities, polytechnics and, at non-university level, "Institutos Pedagógicos" and "Institutos Técnicos Superiores". In accordance with the Constitution and the Ecuadorian Law for the Higher Education, universities whether public or private have autonomy to govern themselves. Higher education institutions are supervised by CES/ SENESCYT.

Figure 2: institutional organogram of higher education in Ecuador



Traditionally, Ecuadorian higher education has been primarily focused on teaching. In general, the level of education was rather high, but it was progressively becoming obsolete and disassociated from the modern social requirements and challenges. Especially, the decline of the higher education system was serious in the decade of the 90's, when the national allocated budget was gradually lowered and legislation amendments allowed the creation of private universities with nearly no quality control. Public universities had to survive and compete in that environment, with little capacity to flexibly interact with other institutions, temporarily or permanently contract interesting professionals, or allow continuous training of their own staff. That situation started to be reverted in the following decade from the central government.

On 22 July 2008, the National Assembly (Parliament) issued Constitutional Mandate 14 giving the mandate to the National Council on Evaluation and Accreditation (CONEA) to elaborate a technical report with respect to the level of performance of the superior education establishments to guarantee quality. The CONEA final report of November 2009 described multiple gaps in the university system related to academic, administrative, research and technological challenges. No more than 12 universities had

some experience in research and postgraduate education. In the report five categories were distinguished for the classification of 68 universities and poly-technical high schools. The report classified the ESPOL, UCuenca and EPN in the highest A Category.

Inside universities, the generation of knowledge was developed under inefficient schemes. There were no full-time research-based master programmes functioning in the country. The emphasis of most graduate programmes was on professional education, designed to aggregate some skills (mostly managerial) to bachelors (professionals in Ecuador). Those who decided to pursue a high quality master of doctoral degree had to go outside the country. The university system was a polarized, fragmented and competitive system.

The New Law on Higher Education of 2010 (LOES)

In October 2010, the new LOES (*Ley Orgánica de Educación Superior*) was launched and later implemented in 2012, at the start of the formulation of the Network programme. The LOES promotes the concept of a university based on three pillars (research, teaching, and community service). The law also introduced important changes in administrative regulations: CONESUP (the Counsel of Ecuadorian universities or the equivalent of VLIR in Flanders) disappeared and was replaced by a National Secretariat (SENESCYT). Another important issue was the importance given to assessment and accreditation, organised by the CEAACES, also a part of SENESCYT. This institution was an outcome of the CONEA report, and responsible for follow-up of accreditation of Universities. At administrative level, SENESCYT became the most important institution for higher education and research.

The LOES favoured professional stability and promotion. Along with the LOES there were stimulus for older professors to retire allowing the younger generation to take over. This process has been, and still is, very chaotic. It provoked the retirement of a good fraction of the staff (in some cases about 50%). In 2014 a deadline was set for 2017 in which universities have to account for 70% of the permanent staff holding a PhD degree. The implementation of the LOES was complemented with an evaluation process of the universities (in 2013 and 2016), and massive scholarship grants for people to study abroad. In addition to these law changes, the years from about 2010 to about 2015 saw large investments from the national government in higher education, favoured by the high oil international prices (Ecuador's main source of income).

Important here was the implementation by SENESCYT of a scholarship programme for higher education abroad and a "prometeo" fund for attracting professors from overseas (all nationalities are allowed) for a period of maximum 2 years. The Senescyt scholarships for Ecuadorian students to study abroad in order to improve qualifications of young professors were awarded on an individual basis without direct link/coordination with Ecuadorian universities.

The universities had to go through a modernisation process resulting in the organisation of an academic service of undergraduate and graduate education, research and services. This required simultaneously working towards: (i) An upgrading of the educational level of the academic staff; (ii) The establishment of quality and competitive postgraduate programmes; (iii) The training of staff in new pedagogic techniques; (iv) The introduction in the institution of a culture of research; (v) Providing staff members with more capacity in the writing of project proposals for research; (v) Providing staff members with more capacity for writing project proposals and manuscripts publishable at national/international conferences/meetings and in peer reviewed journals; (vi) The development of regulations and the strict applications of those regulations for staff recruitment and promotion; (vii) The introduction of a monitoring,

staff evaluation and reporting system; (viii) The modernization of the ICT-infrastructure and the promotion of the use of ICT-based techniques in education, research and services. In fact, the new law was very much in line with the objectives of the VLIR IUC programmes (benefitting ESPOL and UCuenca) and the VLIR-Network programme.

All these national changes have been critically positive, and occurred in perfect timing, becoming a major factor of success for the IUC programme. With VLIR support the Cuenca University has been marching in the right direction by stimulating research, building up high profile professionals, and promoting institutional modernization.

There are several context factors that had a negative influence on the roll-out of these modernisation processes and in particular also on the international cooperation programmes. For example, the implementation of the new rules for financial management of the universities applied by the former Ecuadorian Government made financial transactions since 2013-2014 more bureaucratic. This was due to the implementation of the SERCOP and the further inclusion of the public universities in this system. SERCOP is a centralized system of purchasing and contracting for the public sector. Its purpose is that all public expenditures, carried out in this common “market place”, become transparent and open to all possible suppliers. The intention is to avoid closed “ad-hoc” contracting and therefore corruption. In practice however, the system is highly complex and inefficient. Many service providers do not sell though SERCOP for this reason. Besides, since the public payments are in general delayed up to several months, products offered through SERCOP are always more expensive because sellers charge these extra financial costs to the end user. Other associated extra costs arise because both suppliers and buyers often need to hire specialised people to process their transactions through the system. In qualitative terms, for standard products, a simple purchase that can be done in a couple of days, will take at least about three months through SERCOP and it will cost at least about 50% to 100% more. For universities (research material) the situation can even more complex because the required products are usually not standard. SERCOP does not have the scientific capacity to handle the purchase of scientific equipment and consumables according to strict technical specifications. For some products it is usually hard to find more than one supplier and it is unlikely that these few suppliers are selling through SERCOP.

Since 2010, with the introduction of the LOES, there has been also a much more close and strict control of public universities mainly by CES and SENECYT. Important were also the continuous changes in regulations with immediate and semi-retroactive effect, so that applications had to be revised several times and even already approved programmes required re-application. This includes not only educational programs but also research, funding agreements and recruitment of new professors. Most if not all inter-university programs organised with foreign universities (mainly at Master level) were put on stand-by until their curricula could be (re-)evaluated. This process was slow and took a couple of years. Many (even high quality) programmes had to close because they lost the links with the overseas partner universities who became frustrated by the lack of progress.

This control system was carried out also at financial level. Since SENECYT started financing several national research projects, they requested universities to declare agreements and financing from external institutions, with the purpose of avoiding double financing of projects. External funding made through national agreements would no longer go directly to the university or the project administration accounts, but would become part of the yearly university budget in the Ecuadorian Central Bank through the Ministry of Finances. This is a major drawback for budget use efficiency because the budget has to go through a couple of national institutions, then through the university budget and bureaucracy before it can be used.

Favourable changes at context level

REDU - was created in September 2012, by several national universities, motivated to some extent by the introduction of the LOES (which was implemented the same year): Universidad Central del Ecuador, Escuela Politécnica Nacional, Universidad de Cuenca, Universidad Católica del Ecuador, Escuela Superior Politécnica del Litoral, Universidad Técnica de Ambato, Universidad Técnica Particular de Loja, Escuela Superior Politécnica del Chimborazo, Escuela Politécnica del Ejército, Universidad del Azuay,- Universidad San Francisco de Quito. At present, most Ecuadorian universities are members of REDU.

The purpose of REDU is to carry out activities to promote scientific and academic development, based on collaborative work both among the universities, and also with industrial, community sectors, and public institutions. To this end, REDU aims to create shared communication and administrative mechanisms. Some of its main points of attention are:

- To solve national problems.
- To promote applied research.
- To promote research-oriented mobility (of professors, researchers, and students).
- High level training of researchers.
- To promote publication of scientific and technical articles.
- To optimize the use of resources such as laboratories, infrastructure, and human resources.
- To strength multi-disciplinary research groups.

REDU operates according to specific research lines, which are approved by its Executive Committee. Following these research lines, working teams called “Redes Temáticas” are created. These are constituted by a group (network) of researches from different institutions. REDU projects are financed with budget from the universities (no external funding). The maximum budget for projects is also defined by each university. Once a project is approved by the committee, the universities involved have to ensure uptake.

The REDU initiative has not had the expected impact so far. Some of the *Redes Temáticas* have been able to consolidate and present research projects. Some others are non-operational. The impact of the network in postgraduate programs (which is part of its objectives) is marginal. A recurrent problem is the budget in-balance of the proposals (heavily loaded to only one institution), which reflects the lack of compromise in the network cooperation.

CEDIA - Corporación Ecuatoriana para el Desarrollo de la Investigación y la Academia. CEDIA was created in January 2003, by several Ecuadorian Higher Education Institutions, plus SENESCYT, and CONATEL (Consejo Nacional de Telecomunicaciones). Its main original purpose was to promote the development of advanced Internet use through technological development. Nowadays CEDIA is a non-profit corporation that supports the development of research and academic development. It offers services related to TICs focused on scientific development. CEDIA is also member of other international networks such as RED CLARA (Cooperación Latinoamericana de Redes Avanzadas).

Technological services promoted: advanced network connection; high speed Internet connection, international WIFI (EDUROAM); HPC computing, video conference connection (via Polycom), campus virtual, cloud resources, virtual Machines.

Research services are project incubator, CEPRA projects funding, funding for mobility (for high level congresses), conference funding, project management, CESIRA (training funding), digital databases.

Since CEDIA is a non-profit organisation, but at the same time it generates capital through the services it provides, that capital is either reinvested or used to finance research activities. Therefore, from its origin, CEDIA has been progressively growing. In the context of the VLIR-UOS cooperation, the investments of VLIR in the IUCs has helped the institutions to make better use of CEDIA, through the improvement of their local infrastructure. This has been reflected in the success of the TICs components of VLIR-UOS in the IUCs.

New regulations developed by CES - At political level, after the implementation of the LOES, CES promoted the creation of PhD programs in the Universities classified as A. Several of them were created. The main problem for the functioning of such programs is that at that moment, there were no Master in Science programmes. Currently, CES has adapted its regulation so that the creation of MSc programmes is mandatory for the continuation of the PhD programs. Therefore, the institutional need of MSc programs is clearly established.

Currently, there is a transition of the higher educational system which is changing from “credits” to “hours”. This has affected the two masters in science created in the VLIR-UOS-NETWORK in the sense that they were initially approved only until 2015, because from 2018 on, these programmes have to be structured and approved following the new system.

In this context, together with the LOES, the “*Reglamento de Régimen Académico*” has been introduced, and its implementation is compulsory. An important element of this new system is the concept of ITINERARIES in the different programmes. These Itineraries are intended to give more flexibility to the undergraduate study programmes, in order to adapt to the modern challenges in education, where the traditional programmes do not perfectly meet the needs of the society. The idea of the Itinerary is that once a student has chosen a specific programme/career, and approved a core package of its basic courses, during the later years of the programme, he/she can choose an itinerary in that programme. The student must take the compulsory courses for the itinerary, which roughly accounts for about 20% of all courses. The student is free to choose the other 80% of the courses, which can be chosen from any other faculty, at any other university. In this way the student can build his/her own professional profile. For instance, a student of Mechanical Engineering (basic core courses), that choses an itinerary in Energy, has to take the itinerary specific courses. For the other courses the student can chose other technical courses still in Mechanical Engineering, or maybe others in, for instance, Electrical Engineering, or any other. Otherwise, the student may give him/herself a management profile taking courses of Administrative Sciences, or a more social profile taking courses from Social sciences, etc.

The concept of the Itineraries, also allows students to take courses from Master programmes. Therefore, the institutional structure to articulate undergraduate and postgraduate programs already exists. However, its implementation is not straightforward. The main obstacle is that Faculties traditionally work as fully independent entities. Administratively they are not prepared (probably not willing either) to share courses with others. This is the case for faculties inside the same university. Extrapolating this to all Ecuadorian Universities implies a much bigger challenge. The other big obstacle is that faculties see their carrier programmes as their own soul, so they are not ready to give it up, and allow the implementation of more flexible curricula. In addition, the new system has never been in operation before, 2018 is its introduction year, and not everybody (not even authorities) have a clear idea of how it will be implemented.

1.2.3. Brief description of the VLIR-UOS-Network programme

The focus of the VLIR-UOS Network in Ecuador is the training of advanced human talent in subjects related to bio-diversity and water resources. These will be implemented in two phases. In the first phase (year 1 to 6) two joint master's degree programs were to be established. These joint masters programs were to be developed with international standards aiming at international accreditation. Advantage will be taken from the academic strengths in Bio-discovery and Water Resource Management of the members of the network. The basis for these master's programs was the research capacity already existing in the network partner institutions. The geographical and biological diversity covered by the network partners (ESPOL, EPN, UC, and UTN) guarantees a national coverage of the issues related to the two subthemes. In the second phase of the project (years 7 to 12) it is envisaged to offer a PhD programme, taking advantage of the lessons learned in the first phase, as well as involving some of the MSc graduates.

In terms of capacity building the VLIR-UOS Network programme envisaged to enhance cooperation mechanisms between local universities, joint curriculum development for graduate programmes with international standards, establishing the basis for quality PhD programmes, a common integrated view of diverse issues, and improvement of the research capacity of the less developed universities in the network.

1.3. Evaluation methodology and process

1.3.1. Evaluation framework

The evaluation was implemented in three phases: an inception phase, a phase of data-collection and a phase of analysis and reporting. During the inception phase an evaluation framework (see annex 2) was developed, composed of five evaluation questions related to the five OECD evaluation criteria. The evaluation questions were elaborated based on the evaluation questions formulated in the ToR and the assessment criteria used in the self-assessment reports. The evaluation questions consist of different judgement criteria and guiding questions or indicators. These indicators and guiding questions indicate what information was looked for and as such guided the data-collection and development of interview guidelines. For each of the judgement criteria an appreciation scale was developed as requested in the ToR. A four-point qualitative scale is used.

Excellent	Sufficient	Low	Poor

This scale has not the intention to cover all indicators/guiding questions (some of them are more important in the final judgement than others) but was above all helpful in formulating a balanced judgement in a transparent manner. Table 3 presents an overview of the five main evaluation questions and their judgement criteria at project and at programme level.

Table 3: Overview of the five evaluation questions linked to the five OESO/DAC evaluation criteria

Evaluation questions	Judgment criteria project level or specific points of analysis[1]	Judgment criteria programme level
1. To what extent is the project relevant?	1.1. The objectives of the project are consistent with the needs of the Universities involved, the country/local needs, country educational policies, partner and donors' policies	1.1. The objectives of the Network programme respond to the needs of the universities involved, and are aligned to the country educational reform process
	1.2. Point of analysis: the project has looked for complementarity and synergy with other projects aimed at capacity development and institutional strengthening of the Universities involved in the Network	1.4. The Network programme is a leverage for securing sustainable and impact of several VLIR-UOS projects in the universities involved
	1.3. The intervention logic of the project is coherent	
2. To what extent the project's specific objectives have been achieved (effectiveness)?	2.1. The specific academic objectives have been realised	2.1. The specific academic objectives have been realised
	2.2. The project has ground-breaking nature and ambition (scientific quality)	2.2. The specific development objectives have been realised
3. What is the level of efficiency in the projects?	3.1. Intermediate results have been delivered.	
	3.2. Relationship between means and results achieved and objectives (qualitative assessment)	
	3.3. Project management is conducive for efficient and effective project implementation	3.3. Programme management is conducive for efficient and effective project implementation
4. To what extent the project results will continue at level of the different institutions after the NETWORK programme is completed?	4.1. Level of institutional sustainability	4.1. Level of institutional sustainability
	4.2. Level of financial sustainability	4.2. Level of financial sustainability
5. What are the indications of impact (long-term effects) of the project?	• Not relevant to be assessed at project level during the mid-term evaluation	5.1. Indications of impact at academic level

An assessment of the results at programme level evidently relate to the results at project level. For the assessment at programme level ACE Europe has tried to formulate specific judgement criteria and indicators that focus on the added value and results of the combination of the projects.

1.3.2. Methodology

The evaluators used following methodologies for data-collection.

Analysis of existing data – The evaluators studied existing documentation and in particularly the self-assessment reports. The self-assessment reports were studied and analysed before the primary data-

[1] Specific points of analysis are related to issues that are important to analyse, but will not be scored as such. These points are often related to new policies (of VLIR-UOS or the Belgian Development cooperation) and were not integrated in the programme.

collection. During interviews with the project leaders in Belgium and Ecuador the self-assessment reports have been further discussed.

Outcome harvesting – Complementary to the self-assessments, the documentation, analysis of outcomes was based on the outcome harvesting approach, since it allows a systematic mapping of outcomes and a participatory reflection on their scope, importance and on the programme's contribution. An adjusted version of the outcome harvesting methodology was applied and involved following steps: (1) before the mission: mapping all the outcomes based on document study (self-assessments) and introduction interviews with project leader and network advisors in Belgium; (2) the outcomes were further validated through interviews with internal and external stakeholders; (3) final review of the outcomes and joint sense-making during restitution workshop.

Semi-structured interviews and focus group discussions – Semi-structured interviews were conducted with a variety of internal and external stakeholders, to complement information gained through the different data collection methods. With groups of professors involved in the master programmes and with current and graduated students focus group discussion were organised. (see annex 3 for overview of people consulted)

Restitution and sense-making workshops – Two workshops were organised. One at the end of the field mission, based on a power point, in order to enable all stakeholders involved in sense-making of the data and to identify and exchange on lessons learned. And one at the end of the evaluation in Belgian, to discuss the results of the evaluation with the Network coordinator and advisors.

1.3.3. Limitations of the evaluation

The evaluation was executed as planned. The team could talk to all relevant internal and external stakeholders. The high quality of the self-assessment reports contributed to the quality of this evaluation. It enabled the evaluators to gain a profound insight in the projects' strengths and challenges, which could be validated and further discussed during the evaluation visit.

There were only a few limitations in this evaluation:

(1) There was only limited time to visit each of the Network universities. In fact, only one day was spent at each of the participating universities and three days at the coordinating university. This did not allow for in-depth assessment of the results of the project within each institution.
(2) Only a limited time is available for this evaluation. There was no time to analyse the programme budget and spending in detail or to study more documents, such as for example the monitoring report of course coordinators and meeting reports of the academic committees. By consequence, the evaluation is mainly an interpretative and qualitative evaluation, based on the information provided by the main actors involved. Triangulation of information was looked for, to the extent possible.
(3) There were not much linkages with external actors so not much external actors could be interviewed and time was lacking for conducting more interviews with external actors. It was not possible to analyse the importance of the master programmes for external actors. The evaluators had to rely on the information provided by key stakeholders and the information provided by the market studies done. The evaluators could not control the quality of these market studies (lack of time).

1.4. Structure of the evaluation report

The results of the evaluation are described in following chapters. Chapter 2 presents the assessment of the Network programme according to the different OECD/DAC criteria. Section 2.1. describes the results at programme level and in the following sections the assessment per project are presented. In chapter 3, the conclusions and recommendations are described.

2. Evaluation

2.1. Evaluation of the programme level

In this chapter the assessment of the VLIR-UOS Network at "programme level" is presented, based on the evaluation questions, judgement criteria and indicators developed in the evaluation framework. A cross-project assessment was done, complemented with the assessment of specific programme features. For each OECD/DAC criterion a table is presented that provides an overview of the assessments at project level, which are further elaborated in detail in section 2.2. An overview of the evaluation question and judgment criteria is added in annex 2.

2.1.1. Relevance

Table 4: Overview of the scores for evaluation question 1 on relevance at programme level

	Bio-discovery	Water resource management
1.1. Responding to needs		
1.4. Leverage for securing sustainability and impact of several VLIR-UOS projects		

Relevance

The Network programme is highly relevant for the Ecuadorian context and aligns well to the national policy and the VLIR country strategy. The national "Buen Vivir" policy (2008-2013) addressed issues related to academic collaboration, the development of a qualitative higher education system with a specific focus on science and technology and stimulated multi-disciplinary research. This national policy provided the policy framework for national reform processes in higher education (as described in chapter 1.2). The Network programme contributes to further strengthening of the universities in order to comply with these educational reform processes for higher education. Within the context of higher education reform processes in Ecuador it is clear that there was a need for the development of full-time research-based master programmes. The VLIR-UOS Network is assumed to build-up good practices having potential for up-scaling at national level.

Inter-university collaboration was (still is) not evident in Ecuador, which was also identified when elaborating the VLIR-UOS country strategy. The VLIR-UOS country strategy emphasises the need to increase the quality of Higher Education, putting priority on excellence and research; the need to strengthen the cooperation and synergies within Ecuadorian universities; the need to strengthen academic infrastructure and skills, as well as university management aspects; the need to improve MSc programmes in Ecuadorian universities in order to ease the insertion of PhD graduates.

In both the country strategy and the VLIR-UOS Network priority is given to biodiversity (in the country strategy referred to as 'biodiversity and natural resources'), which are key thematic areas, also in the national 'buen vivir' policy.

As per law, a market study and social studies were done to assess the level of interest for such a MSc among potential students and the labour market. These studies provided a positive picture but the evaluators could not check the quality of these studies. From the interviews it was learned that there are several challenges to that regard. Many students face problems in accessing a full-time MSc course when they cannot rely on a fully funded scholarship (financial bottleneck), private and public actors are not willing yet to send their staff to a two-years master course and the labour market is not able yet to absorb these high educational profiles.

Added value of the Network for securing sustainability and impact of other VLIR-UOS interventions in the universities involved.

Within the spirit of a country strategy it is relevant to look at linkages between several VLIR-UOS initiatives in Ecuador and in particular their relation with the Network interventions and potential for mutual strengthening.

In Ecuador the discussion on the potential for the VLIR-UOS Network programme (identification stage) coincided with the development of the VLIR-UOS country strategy and first conceptual ideas where worked out by the institutional university cooperation partners of VLIR-UOS ESPOL and UCuenca. Based on the conclusions of the country strategy, it was decided to invite ESPOL to propose a Network programme proposal and start a joint formulation process with interested Flemish academic partners. The decision to assign the coordination of the Network to ESPOL has been a good decision, taking into account the experience and capacity of ESPOL for managing such projects (incl. the collaboration with the private company ESPOL-TECH to manage external funding and the funding of the joint masters), the engagement and commitment of the people involved at ESPOL and the fact that UCuenca was still implementing an IUC programme.

The Network programme shows the importance of building further on results achieved through other VLIR-UOS projects, not at least the IUC projects. Within these projects relevant capacity was built (both at educational level and regarding research), infrastructure improved (ICT, laboratories) and international relations and networks strengthened. It appeared easier to mobilise professors and researchers within ESPOL and UCuenca, compared to EPN and UTN, to become engaged in the VLIR-UOS network and in particular to engage tenured staff. The VLIR-UOS Network programme also implied institutional change processes which were more difficult at EPN and UTN. A lot of soft diplomacy was required from the Network coordinators and focal points to explain the features and consequence of a Network approach to the administrative staff of EPN and UTN.

At ESPOL and UCuenca the VLIR-UOS Network contributed to building further on the results achieved through the IUC projects, in particular in continuing strengthening research and lab infrastructure in some of the faculties involved. Through the relationships established by the Network programme with Flemish universities, EPN and UTN formulated proposals for TEAM and SI projects. The Network and the other VLIR-UOS-projects are mutually strengthening each other as the VLIR-UOS Network provides the opportunity to integrate research in the master and the TEAM and SI projects mobilise extra funding for research. Furthermore, student mobility (PhD and master students) between Ecuador and Belgium (both directions) was enhanced as students could be linked to network activities (participating in field work and case studies, participation in network activities such as conferences and seminars, identification of new PhD subjects, etc). Because of the dynamism of the project leaders involved, both in Belgium and in Ecuador, several initiatives were taken to look for collaboration opportunities, PhD opportunities and initiatives were taken to formulate joint research proposals, for example for Erasmus + and Horizon

2020. Also, internationally linkages were looked for with other VLIR-UOS initiatives such as the Network in Vietnam, but these were limited to the participation of the Network universities in international seminars/workshops. It is not clear to what extent collaboration was looked for with other universities in Ecuador that had been involved in VLIR-UOS projects, but were not participating in the Network.

2.1.2. Effectiveness

Table 5: Overview of the scores for EQ 2 on effectiveness at programme level.

	Bio-Discovery	Water resource Management
2.1 Academic objectives		
2.2. Development objectives		

Realisation of the academic objectives

The academic objective has been realised. Two joint master programmes are being implemented: MSc in Applied Biosciences and MSc in Engineering for water resources management. The first two years were taken to develop the joint masters, with specific support from the Flemish Network advisors in developing research-based curricula, organising working group per course, further strengthening research-based education and learning, and alike. During curriculum development, the specific and complementary expertise of each of the participating universities was taken into account and valorised. Students interviewed appreciate a lot having access to the best experts in their research topics in the country.

The development of the joint masters also had a lot of administrative and bureaucratic consequences. Procedures and systems within each of the universities needed to be adapted to enable registration and management of a joint master. This was achieved at the three participating universities (still some administrative bottlenecks at EPN for the MSc in WRM). The elections of higher administrative staff in several universities in 2017 created additional changes. On the one hand, new staff came on board that showed a genuine interest in the joint masters, on the other hand, they were less experienced and many elements needed to be re-discussed.

The joint masters were presented at CES in 2014. Although presented at the same time, the MSc in WRM only received approval 6 months later than the MSc in biosciences (due to slow processes at CES). The first cohort of the MSc in biosciences started in June 2015, while the first cohort for WRM could only start in December 2015. The start of the second cohort for the MSc Biosciences was also delayed as new regulations for master courses[2] came in place in 2016 (see chapter 1.2 on context), which required the presentation of an adapted curriculum. The approval process by CES took some time as key members of CES had been replaced. The second cohort could only start in 2017. The MSc in Bioscience gained approval for 5 years. Also, a revised curriculum for the MSc in WRM was presented at CES but approval was not yet granted at the moment of the evaluation. It is assumed that the second cohort for WRM will start in September 2018. The process for international accreditation for both master

[2] For example: number of hours was adjusted towards 2640 hrs incl. 800 hrs of thesis. For each hour of course there are 3 hrs of autonomous work.

programmes has started (identification of the most appropriate accreditation system) but can only be implemented when three cohorts are graduated.

Many students showed interest and applied for both masters. However, many were not selected because of their non-pertinent educational or career backgrounds or the lack of full-time availability for the programme. It was calculated that at least 8 students are required to be able to organise the master (financially and logistically). During programme implementation – at mid-term - the target was increased up to 20 students per MSc/cohort, from the third cohorts onwards (as such contributing to establish savings that could be used to continue the organisation of the joint masters in future). For the MSc in biosciences 12 students started in the first cohort of which 7 are already graduated (others still need to present their master theses). From the second cohort, 18 students are currently developing their master thesis and are expected to graduate in 2019. In the MSc in WRM 19 students have finalised their master thesis and are graduated or expected to graduate in 2018.

Maybe the most important result is the installation of a collaborative culture among the involved researchers. The project enabled the researchers to get to know each other. At the start there was a willingness to make this work and it was agreed among the researchers to speak out and be honest to each other. Several working principles were agreed. It can be concluded that working together, traveling, visiting each other's university have all contributed to this collaborative culture. Relations of trust have been built, there is more exchange and more collaboration (also outside the Network activities).

Realisation of the development objective

Contribution to the development objective is yet to be seen. The current students and alumni see the master as a step in their academic career. The majority of the students were either working at the university (as lab or research assistant) of recently graduated from pre-graduate studies. The majority wanted to keep on working at the university and several of them pursue a PhD. Students interviewed testified they had chosen for the master out of interest and not as such for improving their career opportunities, claiming that their educational profile would not be an added value for the labour market. Some of them are interested to build their own (consultancy) company. However, enhancing entrepreneurial and managerial competencies is not (yet) included in the curriculum. It was observed that the first cohorts of the master students are above all benefiting the internal capacity development of the universities, which seems very relevant taking into account the need of each university to attract qualified staff with MSc and PhD degrees. As a consequence, only a very limited number of graduated students are currently entering the market to strengthen relevant organisations and institutions in the domains of biodiversity and water resources management. Moreover, from the interviews with external stakeholders, it was learned that the absorption capacity for high profile candidates is rather limited. External stakeholders interviewed still give preference to candidates with a professional master. It must be noted that the current business and research culture within Ecuador is not yet favourable for attracting high profile students. The existence of MSc programmes is rather new in the country and companies are not yet used to hiring MSc graduates. One of the assumptions of the VLIR-UOS-Network programme is that while more MSc graduates will enter the labour market, companies will start realising the benefits of these profiles and start hiring them.

The evaluators have not seen a strategy to disseminate research results to professionals in the field or to develop structural relations with relevant actors in the private and public sector. Linking with the public and private sector is stronger in WRM compared to biosciences, mainly through the invitation of external stakeholders at workshops and seminars (limited in number) and discussing with private sector actors opportunities for research funding (but lack of funding opportunities). In both masters, students were

given the opportunity to present results of their master theses in conferences for which also external stakeholders were invited. Strong communication with government agencies and authorities was needed for practical aspects such as getting permits for field work and sampling.

Senescyt is stimulating research to involve private sector but no joint proposals have been developed so far. This can be explained on the one hand because of the difficulties in accessing the Senescyt funds, the inefficiency of the management of this fund (length of application process) and the choice of research topics. On the other hand, several private companies or research institutes seem reluctant to invest in research and they also have staff with limited knowledge of English. However, the evaluators were informed that the universities have succeeded in including private sector organisations in some of the research proposals (e.g. master theses). E.g. In the Master on Applied Biosciences efforts were made to approach external stakeholders, which resulted into three theses that are being executed in collaboration with private sector organisations.[3] Collaboration with national research institutes is not evident. Attempts were made, mainly by ESPOL (e.g. contacting INIAP). Collaboration is hampered by institutional and financial difficulties within the research institutes and the competition to access research funding between these institutes and the universities.

2.1.3. Efficiency

At programme level, initially only an assessment was planned of the programme management. But the evaluators decided to integrate at programme level the assessment of the relationship between means and results, in order to be able to compare the different projects.

Table 7: Overview of the scores for EQ 3 on efficiency programme level

	Bio-Discovery	Water resource Management
3.2. Relationship between means and results		
3.3. Programme management		

Input-output relationship

In terms of assessment of efficiency, the evaluation did not have the resources or the mandate to do an audit of the financial management systems, or to do an in-depth cost-effectiveness analysis at project level. On the basis of the available reports and interviews, the relationship between input and output and outcome was assessed in a qualitative manner. Overall it can be stated that cost-effectiveness was looked for in both master programmes, project budgets were balanced and in coherence with the programme logic.

This Network programme is a relatively ‘cheap‘ project with important results, building further on results obtained through previous or other, complementary VLIR-UOS-projects. A Network project evidently demands more operational and investment costs compared to personnel costs and scholarships, due to its specific nature. With regard to scholarships, the programme looked for solutions when it became clear that no Scenescyt scholarship would be available for the first cohorts of students. This also resulted in the development of a scholarship policy to support the masters (at ESPOL and EPN). Budget was

[3] Chicha makers (province of Napo), Marcabeli City Hall (province El Oro) and Commercial greenhouses (provinces Chimborazo, pichicha and Gayas)

equally divided over the four universities (purchase of lab equipment, participation in short courses in Belgium[4]).

There was only an underspending in the first year (and a little bit in the second year), which is evident and due to the slow start up of such projects. This was compensated by a little overspending in the following years.

The Network is saving from the tuition fees of the students. The evaluators question why not part of the tuition fee could be used to compensate traveling and lodging costs during field work and internships at the other universities.

It was learned from the interviews that a lot of discussions were held at the start of the programme on the budget division among the different partner universities. A balance finally was achieved between the budget foreseen for both master programmes. During implementation, budget was flexibly managed and transfer of budget between the two master programmes was possible.

Following tables provide an overview of the total budget planned and spent for the VLIR Network programme.

Table 8: Overview of the planned budgets per project of the VLIR-Network programme (in euro)

	AP 2013	AP 2014	AP 2015	AP 2016	AP 2017	AP 2018	Total
MSc Biodiscovery	100,000	100,000	100,000	100,000	100,000	100,000	600,000
MSc WRM	100,000	100,000	100,000	100,000	100,000	100,000	600,000
PSU	30,000	30,000	30,000	30,000	30,000	30,000	180,000
TOTAL	260,000	260,000	260,000	260,000	260,000	100,000	1,380,000

Table 9: Overview of the administrative costs in Belgium and Ecuador, part of the overall PSU cost (in euro)

	2013	**2014**	**2015**	**2016**	**2017**	**2018**
Administration costs in Belgium	7,500	7,500	7,500	7,500	7,500	7,500
Administration costs in Cuenca	12,500	12,500	12,500	12,500	12,500	12,500
Total	20,000	20,000	20,000	20,000	20,000	20,000

[4] For example: One visit to Belgium of one month/university/year; 8000 USD for reagents/university/year

Table 10: Overview of the approved budgets and expense ratio for the years 2012, 2013, 2014 and 2015 (source: annual financial reports)

	2013		2014		2015		2016	
	Approved budget	Expense ratio	Approved budget	Expense ratio	Approved budget	Expense ratio	Approved budget	Expense ratio
Investment costs								
MSc Bio			27,000	111%	24,000	136%	25,000	105%
MSc WRM			36,000	97%	43,595	87%	15,000	143%
Operational costs								
MSc Bio			53,800	96%	45,000	104%	43,000	118%
MSc WRM			49,145	101%	37,655	125%	63,000	137%
Personnel costs								
MSc Bio			8,000	113%	10,000	95%	8,000	102%
MSc WRM			3,000	97%	3,000	70%	2,000	130%
Scholarship costs								
MSc Bio			11,200	38%	21,000	61%	24,000	31%
MSc WRM			11,854	100%	15,750	59%	20,000	21%
Total								
MSc Bio			100,000	95%	100,000	102%	100,000	93%
MSc WRM			100,000	99%	100,000	97%	100,000	115%

Project and programme management

Programme management was designed as a 'third' project. A programme support unit (PSU) was created at ESPOL. The objective of the PSU is to fully organise and operate the VLIR-UOS-Network in order to coordinate research and academic activities. Activities include development of procedures and monitoring activities, coordinate website, organise monthly meetings of the academic committee, reporting (monthly, quarterly, annually). All stakeholders agree about the high quality and professional standard of programme management as conducted by the PSU.

Following factors have contributed to the high quality of the programme management and coordination:

- Presence of appropriate management tools enabling adequate and transparent financial management;
- Continuity of the programme manager at ESPOL, the same person was responsible for the entire programme duration phase one and demonstrated high quality of management capacity;
- The investment in capacity development of the programme manager at the start of the programme to acquire sufficient knowledge on result-based programme management (technical and financial), the administrative guidelines and reporting formats applied by VLIR-UOS;
- The effective and efficient organisation at the ICOS in UGent;
- Transparency in procedures and decision taking processes;
- Clear guidelines and procedures, understandable and applicable for all;
- Swift communication between PSU and ICOS and between PSU and focal points at the different universities;
- Clear definition of roles and responsibilities between programme coordinator, focal points and programme managers;
- Timeliness of focal points and programme coordinators at the different universities regarding narrative and financial reporting;
- The presence of ESPOL-TECH for financial management, high capacity of their staff and good collaboration with the programme manager;
- The establishment of an inter-institutional committee with participation of the rectors of the universities involved and of the inter-institutional academic committees per project with participation of the programme coordinator and focal points that meets regularly.

Following factors had a rather negative influence on programme management and coordination:

- The changing government rules and regulations, in particular at the level of CES;
- The lack of sufficient communication - at some times - between focal points and other staff members involved in the projects within each university;
- The lack of swift communication about budget expenses between the different focal points in Ecuador and at the Flemish universities in between the development of quarterly and annual financial reports.

For the first VLIR-UOS-Network programmes the approach of Network advisors was adopted. Interviewees agreed that the roles and responsibilities were not very clear but this did not hamper collaboration and programme management. Network advisors spent time and efforts in the programme according to time available and relevance of their contributions.

2.1.4. Sustainability

Table 11: Overview of the scores for EQ 4 on sustainability at programme level

	Bio-Discovery	Water resource management
4.1. Institutional sustainability		
4.2. Financial sustainability		

Academic and institutional sustainability

Ownership at institutional level is guaranteed to a certain degree. A MoU was signed by all rectors, committing their universities to implement a joint master. This willingness is not a guarantee for leveraging sufficient support for project implementation, as evidenced by the several commitments of universities to become engaged in other inter-institutional collaborations, which have not resulted yet in concrete joint educational or research projects (see 2.1 context).

At the start of the project, implications of a joint research based and full-time master were not fully understood by all universities. Moreover, even within the universities a culture of collaboration between faculties or even between research groups was almost non-existent, and not supported by the administrative systems. At UTN, the focal points lacked sufficient support to become engaged in the project (lack of sufficient professors with PhD, coordinating tasks assigned to temporary staff, etc.); at EPN there were several staff changes hampering continuity; at EPN and UCuenca there were challenges in adapting the bureaucratic and administrative systems to manage well the master. At EPN and UCuenca initially, there was reluctance from the planning departments to assign sufficient hours for teaching in the master. At EPN not all vice-rectors and deans involved were willing to support a research-based master. Rigidity at administrative level hampered the search for flexible and relevant solutions for ample practical problems.

During programme implementation following factors contributed to enhancing commitment of the top level administrative staff:

- The fact that CES approved the master was conducive for creating more willingness at administrative level;
- The increase in publications delivered by the joint masters was conducive in convincing staff at administrative level about the importance of organising a research-based master (enhancing the positioning of the university);
- The soft diplomacy of the programme coordinator and the focal points contributed to improved engagement of the different actors within each of the universities.

Eventually administrative systems and procedures at each of the universities have been adapted to manage well a joint master (some problems still to be solved at EPN for the registration of the MSc in WRM). The level of institutionalisation is the highest at ESPOL. The university even has assigned specific infrastructure to be used by the two joint masters (class room for virtual classes, office space for individual and group work by students, place for tutors and their students). But also, at UCuenca and EPN there are specific class rooms assigned to the joint master programmes (and UTN has also made infrastructure available for the virtual class-room).

At the three universities the majority of professors teaching in the MSc are tenured staff and they were assigned sufficient hours to spent in the joint master. All teachers combine teaching with research (and some of them also combine this with administrative tasks). The extent to which staff engagement in the joint masters is systematically taken into account by all universities varies. The example was given by UCuenca where the planning department forgot to include teaching hours for staff involved in the MSc in WRM for the second semester.

Teachers interviewed complaint that the workload of their involvement in the joint master was underestimated: the development of the course required more time as (i) course design based on outcome learnings required more time and (ii) courses were given by teachers from different universities which required time for coordination, not only during the design phase but also during implementation. Nevertheless, teachers interviewed experienced the added value of the MCs, also strengthening their research, and were willing to invest this extra time. Teachers learned to know each other and are taking other initiatives for joint research and collaboration (several examples were given).

The MSc in biodiversity is awarded with a five-year approval by CES and all universities are committed to continue operating jointly. Moreover, a joint master is cheaper as each university bears only 1/3 of the total cost. The approval for a 5-year duration of the MSc in WRM is expected to arrive soon.

As a result of this first experience with the organisation of a joint research-based master, all universities gained experience in collaboration and administrative systems have been adapted. The challenge will be to continue this joint collaboration once the VLIR-UOS-Network will be finished and no extra funding will be available anymore for coordinating tasks (see financial sustainability). It is clear that each university will continue implementing a research-based master (as demanded by the regulation for higher education). One can assume that the universities are experiencing the added value of combining expertise form different universities and will continue to give preference to a joint master compared to organising these masters separately.

Furthermore, the need is created to develop a doctoral programme in natural resources (combining biosciences and WRM) as several of the graduated MCs students have shown interest in a doctoral programme. Moreover, the CES regulations stimulate the universities to develop domestic doctoral programmes. The continuity of the MSc is important for the doctoral programme.

The biggest challenge for the continuity of the joint masters is the influx of students. Professionals in the practice have not shown much interest, which was explained by (i) the fact that the master is full-time and lasts for two years and (ii) the master does not automatically lead to more (or more rewarding) job opportunities.

The fact that Senescyt decided to install again a budget for national scholarships from 2018 onwards and the fact that the master programmes have been recognised as national priority programmes opens perspective of attracting more students.

In general, the undergraduate programmes have a relatively long duration (e.g. engineering careers last normally 5 years but the average is always above). Because the MSc and undergraduate programs are not articulated, the students can only start the MSc programme after their graduation. This results in a very long study period, considering specially that MSc programmes, by regulation, have to be 2 years full time. In general, it is very difficult to shorten the length of the undergraduate programs because the level of secondary education is “in general” deficient in Ecuador, so universities have to spend a couple of years in bringing everybody to the same level. However, there are some high level secondary schools, whose students perform very well, but they are to some extent penalized by the system, because they

have to follow the standard streamline. An honour programme (such as that of Vanguardia at UCuenca), if properly articulated, could allow promoting good students, to shorten their study periods, and be incorporated in the MSc programs more efficiently. This is possible within the current regulation framework but no one has tried to implement it (even Vanguardia is currently vanishing at UCuenca).

In the labour market, the MSc programmes are not higher valued than a professional master, so there is no added value for the student. In general, in the private and public sectors, experience is preferred to specialised education. This is a problem that all MSc programmes are facing today. MSc are very new and nobody has the certainty that a MSC graduate could perform better/differently. On the other hand, most current professional master programs have a bad reputation because of their low educational level. Nonetheless there is a huge market for them because professionals (already employed) have a direct access to higher salaries (promotion) when they obtain a master diploma (independently if it is useful for their carrier or not). Fortunately, this is not always the case, and some institutions (and individuals) are eager to invest in specific training and education. However, while the 2 years full-time format of the programmes is good from the university point of view, this format is prohibitive for most institutions.

Financial sustainability – A master programme, by law, must be self-financing. The current joint master, co-funded by three universities, is very cost-effective for each of the universities involved. Moreover, external budget is covering expenses related to traveling of professors, joint group work and coordination meetings. This budget is currently paid by the project (external funding) and managed by ESPOL-TECH.

From the interviews it is learned that the three other universities have more rigid administrative systems, which might hamper mobilisation of sufficient resources internally for coordination and collaboration once the project is finished, but which are required in a joint programme. The project is currently saving money from the tuition fees of the current students, which will enable the financing of network activities for a certain period and management of the joint master programmes will be further taken forward by ESPOL-TECH as CES authorised ESPOL-TECH to manage the funding of the joint master programmes. The situation at long-term is unclear. No discussion has started yet on a financial strategy at long term.

The Network is used as leverage for attracting other funding, but still mainly from VLIR-UOS budgets. A total of nine research proposals were approved for funding (for more than 1,3 million EUR), of which 8 funded by VLIR-UOS. From the interviews it is learned that there several ideas related to the formulating of research proposals are circulating and that researchers are looking for funding outside of VLIR-UOS.

2.1.5. Impact

Table 12: Overview of the scores for EQ 5 on impact at programme level

	Bio-Discovery	Water Resource Management
5.1. Academic impact		
1.2. Development impact		

Impact at academic level

Good results were obtained in developing research based joint master in biodiscovery and WRM, based on innovative approaches for curriculum development, course design and research-based learning. Upscaling of these new approaches remains to be seen:

- *Research based curriculum development*: during curriculum development support was provided by one of the network Advisors, M. Valcke, having specific expertise in this area. People involved acquired experience and knowledge on research-based curriculum development. However, an up-scaling strategy was not foreseen. Models for curriculum development or capitalisation of the experience have not yet been developed. Moreover, administrative staff at departments for postgraduate studies and educational departments have changed since the start of the project and it is not clear to what extent knowledge transfer has taken place. People interviewed seemed to have some knowledge of concepts and approaches applied but had not fully internalised this approach. Only at ESPOL several interviewees referred to the fact that several other MSc have been developed since the start of the Network, according to the same principles. Similar initiatives have not taken place yet at EPN and UCuenca.

- *Research based learning*: all teachers interviewed are enthusiastic about the RBL approach. All teachers said they integrate research in their courses. Research capabilities to be acquired by the students had been identified. Students are learning how to do research (both literature and in the field), how to find and make use of reliable literature sources and how to write scientific papers. RBL seems to be more applied in the MSc on WRM than in the MSc in biosciences. Where the latter limits the hours in lab and focuses more on studying literature and writing articles (which was not entirely new for many students as they were already working for the university), the MSc in WRM has integrated much more field work in the master course. Results from field work were integrated in the courses, in the research of master and PhD students and reflected in scientific papers.

  Students interviewed testified that in several courses there was repetition, either of content or of (research) tasks. Teachers interviewed confirmed that the joint master requires a lot of coordination. Teachers mostly are only responsible for 2 or 3 sessions in a specific course and some found it difficult to keep an overview and align their activities and tasks with tasks given by other professors. A course coordinator was assigned for each course to manage this cooperation, but this appeared not always to be successful. There was no time for the evaluator for further investigation on this issue.

  Not all teachers interviewed had received the training on RBL (limited number of trainings, changes of staff). Training on RBL still depends on the Network activities and budget. RBL is not yet integrated in the learning package for continuous teacher training at each of the universities.

RBL could not be fully applied. CES regulations still focus on a substantial number of hours in class whereas the Network programme intended to find a better balance between theoretical classes and practical classes such as lab and field work. Another example refers to the courses on scientific writing. Initially it was intended to include this as a seminar in the master course, but CES obliged to make it a specific course. Teaching hours also had to increase. To fulfil the requirements imposed by CES, the initial proposal of the master courses had to be revised.

- *Virtual class room and distant learning*: very early in programme implementation it was decided to organise the masters through virtual classes as students would not be willing to travel to each of the universities. A lot of lobbying was done towards CES to gain recognition of virtual class rooms as a course in-residence, which was eventually approved. As there was a lot of reluctance from many teachers, several trainings were provided to learn teachers to make use of virtual class rooms. From the interviews with students and teachers it is learned that the majority of the teachers is able to make optimal use of the virtual classroom, though there are some exceptions that do not perform well. Till last years the use of virtual class rooms was hampered because of technological problems, mainly at EPN. This has been solved. A study was done on the results of the virtual classroom, showing that there are no significant difference comparing the student grades of students attending a lecture in real presence or via Polycom. Documenting this good practice still needs to be done. Interviewees informed the evaluators that they hear some resistance/doubts from other universities to apply virtual classroom. This practice can be shared in the REDU-network as it is an appropriate way to organise in an efficient manner joint master courses.

Apart from ESPOL there is no evidence that good practices obtained in the Network programme are being shared with other faculties within each of the Network universities and abroad. There is some evidence of UTN applying RBL also in pre-graduate courses. The biggest impact is situated at the level of CES who has adapted the regulations to approve joint research-based masters.

Since 2012 the intention for inter-university collaboration in Ecuador has increased, with the creation of network of rectors, the CEDIA network (already since 2008) and the REDU initiative. Apart from CEDIA that is awarding specific research proposals, not much initiatives have been taken for joint education and/or research. It can be assumed that the joint programme on WRM has accelerated the REDU-initiative to establish an inter-university network in WRM. More than 20 universities are currently signing the collaboration agreement. It remains to be seen to what extent this network will become functional.

Impact at development level

As the realisation of the development objective is yet to be seen, the developmental impact is also limited. There are no examples of research being taken up by external stakeholders and graduated students are not yet working in the field. In fact, only examples are given of seminars/workshops/conferences with the participation of external stakeholders and implication of some private sector companies in MSc theses research, but relevance and application of research results cannot be evidenced yet. This is understandable as it is too early to see possible applications. Only one cohort of students is finishing their theses. Applications could be subject of theses of students in the following cohorts and/or by investing in technology transfer mechanisms. This should become more visible in the second phase of the programme.

Furthermore, the Network programme is being implemented by a sort of ‘elite’ group in which the best Ecuadorian universities are participating. While the universities inside the VLIR-UOS Network are offering an advanced master programme, with research being carried out at high level, the needs in these areas outside this group of universities remain completely unattended. In the water sector for instance,

most Ecuadorian provinces in the mountain region (where water resources are abundant) do not have 24h water supply. In a large part of the coastal communities, there is no tap water whatsoever. Local actors (e.g. municipalities) need to train their staff, but in most cases these people cannot move to the main cities to receive training. The MSc programmes could reach out to those communities, by agreement with other local universities, and look for solutions how to open the master courses for potential candidates in these more remote areas.[5] A bottleneck is the fact that students from province universities have in general a much lower level, which will certainly affect the teaching performance and efforts. Another bottleneck is the fact that many other universities will not qualify for participation in the joint master, as they lack appropriate infrastructure, and sufficient professors with a PhD degree (as such CES will not allow their participation). The network universities are making efforts to collaborate with a number of universities in other provinces and to look for solutions to attract students from these universities.

[5] With regard to WRM, for the first cohort most theses focused on local issues, as this was the first experience for the universities. It is expected that more provinces will be targeted by the following cohorts. In Bioscience, research was being conducted that was relevant for 6 provinces, of which 3 provinces are not related to the network universities.

2.2. Evaluation per project

2.2.1. Bio-Discovery

The development of a research-based joint master programme in biodiversity will increase the understanding of biodiversity and explore the applications to help solve society's problems, thus increasing its awareness about the relevance of conducting research on this topic. The educational model to be used will be aimed at building the skills necessary for the development of scientific research, which will also facilitate the proper performance of the master's thesis, as important part of the programme. The courses will be taught necessarily based on state of the art of research, considering the trends in biodiscovery. Furthermore, the joint master program will contribute to create a favourable environment for collaborative graduate education and research among Ecuadorean universities. The targets set for Phase I of the project relevant to this objective are: the approval of the joint Master's programme by CES by 2014, the graduation of two promotions of students from the Master's programme by 2018 and the start of the international accreditation process of the program by 2017.

Six groups of intermediate results were formulated:

1. Design, implementation and operation of the master programme
2. Implementation of Educational Support Strategies and tools in order to promote innovations both in classes and in other learning environments.
3. Education support-oriented research, which includes the participation of at least 2 interuniversity PhD students whose research will fill identified gaps that can be present in the network in specific topics.
4. Integrated network activities, referring mainly to joint specific activities at field or lab level in order to promote integration of network members. The objective is to generate spaces to share knowledge and practices.
5. Short trainings in Belgium to update or acquire new knowledge.
6. Workshops and conferences in which research results are shared with both local and international scientific communities, and public or private organisations involved in the management of biodiversity and water resources.

	Hosting Faculty	Number of staff involved (% with PhD)	Number of students 1st and 2nd cohort	Number of publication in peer reviewed journals
ESPOL	Faculty of Life Sciences	12 (+ 15)	4 +10	3 (one jointly with EPN and one with UTN)
U Cuenca	Faculty of Chemistry	7 (+16)	5 + 4	1 (jointly with EPN)
EPN	Department of Food Science and Biotechnology	6 (+3)	3 + 4	3 (one jointly with ESPOL and one with U Cuenca)
UTN	Faculty of Agriculture and Environmental Sciences	3 (+ 4)	/ + /	2 (one jointly with ESPOL)

Following table provides an overview of the results in the Key Result Areas, as per 2017.

KRA	Indicators (target)
Research	Within the Network 5 publications were published in international peer reviewed journals (7 more submitted). 40 conference abstracts were developed, mainly for the biannual meeting on biodiscovery. 15 conference contributions in the form of posters or lectures. One research topic database was developed. Two manuals on chemical screening and characterisation of molecules were developed and used as laboratory manuals by the master's students.
Teaching	Academic and scientific plans for the MSc were approved by participating universities in 2014 and updated in 2016. The MSc in biodiscovery was developed (preceded by a market study) and accredited by CES in 2015 for two years and in 2017 for 5 years. Two cohorts of students have started; one in 2015 and another in 2017. It is planned to start a third cohort in 2018. A marketing strategy was developed applying a mix of channels such as social media, website, leaflets and local media. Educational materials developed and available for the students through the e- platform (Canvas). Manual on structure and requirements of the Master's thesis was elaborated and further adapted at the level of each university to comply with graduation requirements of each partner university. All master theses are co-directed by researchers of the different VLIR-Network universities and targeted regional issues. From the first cohort 12 students have finalised their master thesis. All master theses have a scientific focus and are research based. A workshop was conducted on current trends on biodiscovery research and a report of the workshop is available. Once every semester students move to one of the host universities for one week and all master students of the first cohort did a one-month internship at another Network university (fieldwork, lab work). Students have also followed a one-week course including field work at UTN in 2016.
Management	A procedure manual for the management and development of an inter-university master was developed. Research protocols for master theses also developed. Two platforms are being used to manage the master programme, depending on the choice for a certain e-platform at every university. Working groups per course have been established that meet frequently. An academic committee was created with participation of the focus points at each university to monitor the development of the academic curriculum and its implementation. There are frequent meetings to monitor progress of each cohort. Once a year there is the international steering committee meeting to evaluate progress of the project.
Human resources development	Training was conducted on research-based education for 32 participants of three universities: training on RBE was organised in Ecuador and in Belgium. 1 short training course organised in Belgium (target was 8): - Training on Bioinformatics and Epigenetics (one prof from ESPOL and one from U Cuenca) 10 short training courses organised in Ecuador (target was 3). - Molecular microbiology and proteomics, given by ESPOL professors - Bio-materials, given by Promoteo prof. at ESPOL - Proteomics, given by Promoteo prof. at ESPOL - Chemical characterisation, given by Belgian prof at ESPOL and U Cuenca - Bioinformatics, given by Belgian prof at ESPOL - Food safety, given by prof at ESPOL and U Cuenca (also attended by external stakeholders form private and public institutions)

	- Data mining, given by Belgian prof U Cuenca - Grant writing, given by a local visiting scholar at ESPOL and U Cuenca - Bioremediation, given by prof at UTN (for Master students, one-week training) Courses on design thinking, writing of syllabi, communication were offered as part of the regular training of professors at each university. 12 master students graduated at the end of the first phase (graduates from the first cohort). 90% of these students were working at the university and are interested in an academic career. 4 PhD students are identified in the first cohort by the universities (another 3 in the second cohort). 32 visits to universities within the Network.
Infrastructure management	Laboratories at each of the 4 universities are further equipped with bio-discovery related instruments. Accessibility of labs (opening hours, duration) for master students varies between the universities. - EPN: cell dismembrator, universal agitator and microwaves - UTN: water deionizers, refrigerated centrifuge - ESPOL: cell electroporator - U Cuenca: mice stimulator In the 4 universities classrooms are equipped with distance-based education instruments (3 polycot systems were acquired). At ESPOL students also have access to specific space for group work and study. A Network repository of books and journals related to bio-discovery was developed and statistical software was purchased.
Mobilisation of additional resources	Four joint research proposals were approved by funding agencies: 3 VLIR-UOS funded projects (2 TEAM projects (EPN-UC-U Ghent; EPN-ESPOL, VUB) and 1 SI (ESPOL-UTN-HoGent) and 1 national funded project by CEDIA (ESPOL-UC-EPN). Joint research proposal developed for Horizon 2020. Two research proposals submitted for funding to CEDIA
Extension and outreach	Participation in 6 conferences: - Biotechnology and Biodiversity conference in Guayaquil (May 2015): 15 speakers from the network and 4 speakers from Belgium - Food engineering conference in Quito (November 2015): 4 speakers from the network and 1 speaker from Belgium - First symposium on public health at U Cuenca (February 2016): x speakers from the network and 1 speaker from Belgium - International conference on Biotechnology in Guayaquil (October 2016): 4 network members and 6 students participated with oral or poster presentations - IICTA 2016 conference in Bogota (November 2016) - Biodiscovery meeting 2017 at EPN, Quito Three leaflets for natural resources management developed and one audio visual material. In 2014, one meeting with the business sector was organised and a workshop on biodiscovery trends. In 2017 the biannual international meeting on biodiscovery was organised by the network universities. One white paper on biodiscovery policy is being prepared. 8 professors and researchers presented research results in international meetings in 2016 and 2017

Relevance	
1.1 Responds to needs Score: Excellent	- National 'Buen Vivir' policy pays due attention to academic collaboration, the development of a qualitative higher education system with a specific focus on science and technology and stimulates multi-disciplinary research. - Biodiversity is a key thematic area in the national 'Buen Vivir' policy. Attention for biodiversity is materialized through the national law on biodiversity. - A market study was done to assess demand and offer from such a MSc in biodiversity. The study revealed that an interest exists among possible students and that the labour market is looking for such profiles. - Choice for research topics is influenced mainly by the interests and competencies of the researchers, but attempts are being made to involve external stakeholders (private and public) in identifying research topics, but still limited and differences between universities. - External stakeholders had no influence on curriculum development - Four universities have complementary expertise - The development of a MSc and application of RBE is in line with the educational reform processes in Ecuador - The project is fully consistent with the VLIR-UOS country strategy - The Network programme addresses explicitly transversal themes of the Belgian development cooperation such as environment and D4D (e.g. virtual class rooms, digital platforms, and alike). No specific attention for gender.
1.2 Synergy	- The project builds further on the results achieved of the former IUC's at ESPOL and U Cuenca. During the first phase, efficient use mas made of resources available (incl. professor's mobility) to align activities developed within the IUC with U Cuenca and the VLIR Network. - The collaboration within the VLIR Network has resulted in the development of several research proposals, together with the Flemish partners, presented at VLIR. Several VLIR-projects are mutually strengthening each other. - Synergy is mainly looked for within the VLIR-context. Not much synergy is looked for with other (Belgian) donors/actors. - Attempts are being made to align the VLIR Network with other capacity development initiatives within each of the universities, e.g. looking for integration of RBE training in continuous education programmes, but still limited and to a varying degree within each Network university
1.3 Coherence Score: Excellent	- The intervention logic is coherent and the choice of activities is relevant for obtaining the results and objectives. - Focus of the strategy is the development and implementation of the MSc in biodiversity. Less attention is given to the institutional changes needed within each university. A lot of soft diplomacy was conducted that was needed to obtain the results, but not formally included in the intervention strategy. - The project responded flexibly to changes in the context (e.g. new regulations for MSc developed by CES)

The project on biodiversity is highly relevant for the Ecuadorian context and contributes to further strengthening of the universities in order to comply with the educational reform processes for higher education. This is the result of a good preparatory and formulation phase and of the experience VLIR and the Flemish partner have built over the years in the country.

The transversal themes of the Belgian development cooperation are relevant for this project. The themes of environment and D4D are evidently addressed in the project. According to the project document specific attention would be paid to gender[6] but no specific actions are known by the evaluators. Interest for this MSc in biodiversity is high among female students, as such the project provides an opportunity for women to become involved in sciences and have access to an academic career, but this is not a specific result of the project.

In terms of subject areas, biodiversity (and natural resources, including management) was the most relevant theme proposed in the Ecuadorian strategy document developed by VLIR for both Flemish and Ecuadorian Universities. Other sub-themes match with this subject such as biotechnology, bioinformatics, biodiversity management, nanotechnology and biotechnological industry.

Effectiveness	
2.1 Academic Score: **excellent**	- Development of MSc in bio-discovery, accredited by CES - Adaptation of the curriculum to the new regulations of CES (year 6) - Start of the international accreditation of the MSc - Application of RBE - 12 students in first cohort and 18 students in second cohort - MSc biodiversity institutionally integrated in the administrative systems of each of the network universities - Culture of team work and collaboration established, within participating faculties and between the Network universities - Strengthened research groups at each university - Students having access to experts in diverse domains - All students supported by a promotor and a co-promotor from different universities
2.2 Development Score: Low	- 18 out of the 30 (60%, indicator was 50%) students and alumni were working outside the university at the start of the master.[7] - Alumni (only recently graduated) have not yet found a job outside of the university that fits with their educational profile - No evidence of knowledge uptake by external stakeholders yet (too soon) - One white paper on biodiscovery policy is being prepared - Food safety course organised for students and professionals
2.2 Scientific quality Score: Excellent	- 86% of professors teaching in the master have a PhD (5/37) - The majority of them aims an academic career and 7 out of 20 interviewees (35%) would like to do a PhD. - 5 publications have been produced in international peer reviewed journals (7 more submitted) - All 12 students of the first cohort have presented their thesis before a scientific committee (or are about to finalise) and have been graduated. - Scientific research lines developed and implemented

[6] Empowering women in research environments during the implementation and operation of the two masters' programs, Reconciling the academic and the private life of women when necessary (pregnancy, maternity, etc.), Promoting also gender and scientific excellence, Promoting research in the domains of the program associated to gender.

[7] The evaluators have interviewed 20 students and alumni, of which only 3 were working outside the university. Apparently it was difficult to mobilise students working outside the university to participate in the focus group discussions. Evidently, this created a wrong perception of the influx of students among the evaluators.

The academic objective has been realised. The first two years were taken to develop the joint MSc, with specific support from the Flemish Network advisors in developing research-based curricula, organising working groups per course, further strengthening research-based education and learning, and alike. The development of a joint master also had a lot of administrative and bureaucratic consequences. Procedures and systems within each of the universities needed to be adapted to enable registration and management of a joint master. This was achieved at the three participating universities.

The joint MSc was presented at CES in 2013. After two revisions CES granted the Network the approval of the MSc in biodiversity to open up to two cohorts in 2015. The MSc was launched in February 2015 and started in the second semester of 2015 (June). The start of the second cohort was delayed because of the launch of new regulations for master courses[8] in 2016 (see chapter 1.2 on context) an adapted curriculum needed to be presented. The approval process by CES was delayed (key members of CES had been replaced). The second cohort could only start in 2017. The MSc gained approval for 5 years.

Many students showed interest and applied for the MSc (93 for the first call, more than 100 for the second call). However, many were not selected because of their non-pertinent educational or career backgrounds or the lack of full-time availability for the programme. For the first cohort, 23 applicants passed the evaluation process and 18 students met de the minimum requirements. 16 students have started of which 4 dropped for various reasons (incl. funding). This shows that better information still is needed to attract applicant with the correct profile and as such diminish the administrative workload of managing the application process. It was calculated that the at least 8 students are required to be able to organise the master (financially and logistically). The increase in students in the second cohort also is a result of 'word of mouth' promotion and satisfying students from the first cohort.

Contribution to the **development objective** is yet to be seen. The students interviewed of the first two cohorts see the master as a step in their academic career. 40% of the students were either working at the university (as lab or research assistant) of recently graduated from pre-graduate studies. The students interviewed that were working outside of the university had chosen for the master out of interest and not as such for improving their career opportunities, claiming that their educational profile would not be an added value for the laboratories or pharmacies they had been working for. Some of them are interested to build their own (consultancy) company. However, enhancing entrepreneurial and managerial competencies is not (yet) included in the curriculum.

As described at programme level, the evaluators have not seen a strategy to disseminate research results to professionals in the field or to develop structural relations with relevant actors in the private and public sector. There is anecdotic evidence by each of the universities to inform the wider public on research results (see table with overview KRA – extension and outreach), often also supported by the departments for outreach and community development in each of the universities, but a strategy is lacking.

There is anecdotic evidence of researchers approaching private and public-sector actors. E.g. at ESPOL there have been interactions with INIAP and cacao companies in Guayaquil, in the framework of establishing a platform for research on cacao. These interactions have been beneficial for the research conducted on cacao; but the functioning of this platform is not yet institutionalised and lacks funding. At UTN and EPN there are regularly interactions with farmers, which are informative to identify

[8] For example: number of hours was adjusted towards 2640 hrs incl. 800 hrs of thesis. For each hour of course there are 3 hrs of autonomous work

research lines. Based on these interactions food safety came on the research agenda. These efforts already resulted in the collaboration with three private companies for theses research. The food safety course, open for students and professionals is the only outreach event that was developed during the first phase of the Network project.

Scientific quality – The research groups at the participating universities have been further strengthened. Researchers can rely on master thesis students which also contribute to a higher number of publications. Students have presented their research results, not only before the scientific committee composed by researcher of the Network universities but also at scientific conferences. Competences of researchers also have been further strengthened, through the joint collaboration, the short courses provided by Belgian professors in Ecuador or in Belgium, the further equipment of the laboratories and the funding attracted for (joint) research. The Network Universities comply with the requirements of having at least 70% of teachers in the master course with a PhD. For this reason, UTN is not yet one of the hosting universities. Since the election of the current rector, UTN has started to contract more PhD staff which will enable their participation as a hosting university in the second phase of the programme.

A research topic database was developed. Two manuals on chemical screening and characterisation of molecules were developed and used as laboratory manuals by the master's students. Four joint research proposals were approved by funding agencies: 3 VLIR-UOS funded projects, 2 TEAM projects (EPN-UC-U Gent; EPN-ESPOL, VUB) and 1 SI (ESPOL-UTN-HoGent), and 1 national funded project by CEDIA (ESPOL-UC-EPN). A joint research proposal was developed for Horizon 2020 and two other research proposals submitted for funding to CEDIA. Four research proposals were presented at Senescyt-FWO but none were approved. Other joint research was undertaken that included student internships and undergraduate thesis of Belgian students (2 students from HoGent and one student from Vives, at ESPOL).

Efficiency	
JC. 3.1 Intermediate results Score: Excellent	- All intermediate results have been implemented and targets were realised as planned (see overview in table on KRA) - Inter-institutional PhDs in biodiscovery, one on Food Fermentation and one on Chemical Characterisation of biomolecules - Some delays in implementation due to internal and external factors. Delays have been properly managed
JC. 3.2 relationship input - output Score: Excellent	- Relatively cheap project with lot of results - Time for soft diplomacy and network building and workload demanded by RBE was underestimated - Relevant identification of advisory support demanded from Flemish counterparts - Efficient use of available means, e.g. organising more training courses in Ecuador instead of in Belgium - Underspending in the first years justified by the progress of the project - Flexible use of available budget - Network used as leverage for attracting other funding, but still mainly from VLIR-budgets
JC. 3.3 Project management	- Good working relationship with other universities and coordinating hub (ESPOL)

Score: Excellent	- Clear management guidelines, division of roles and responsibilities - Reporting requirements respected by all universities - Transparency/communication in budget spending can be improved - Factors hampering efficiency have been managed well

Intermediate results – have to a large extent been achieved (see table KRA). The project was well developed, planned and monitored. Not all targets were fully realised but without having a negative effect on the realisation of the objective, the lack of scholarships excepted. In fact, it was assumed during project formulation that Senescyt would continue to distribute scholarships, also for in-country master courses. The master in biodiscovery was recognised by Senescyt as a national priority programme, however, budget for national scholarships decreased drastically. This had a negative effect on the inflow of students as the master course was designed as a two-year full-time programme (12 students started in the first cohort, 18 in the second, instead of targeted 20/cohort). The Network universities have managed this to the extent possible. Five students could obtain a full-funded Scenescyt scholarship. ESPOL gave a scholarship from own resources to one students. From the Network budget two full-funded VLIR scholarships were assigned to two students living in difficult conditions. In 2016 the 4 best students received a 2150 USD tuition scholarship and the other 8 a 8500 USD tuition scholarship. 10 students received a mobility scholarship from the Network budget.

Student mobilisation was also hampered by the lack of funding. Doing a one-month internship at one of the hosting university was for most of the students not evident. The mobility scholarships provided by the Network programme were helpful to that end. Lack of funding also had an influence on the student's choice for thesis subject. Some of the students interviewed testified that they wanted to do their thesis on a subject within the expertise of a professor working at another university. As this required more traveling, students preferred to choose a topic within the domain of expertise of their university. Student mobilisation enabled access to laboratories of other universities. However, access to these labs was not always sufficiently guaranteed. Also, for thesis students, there were sometimes problems having sufficient access to the laboratory (e.g. U Cuenca).

Short training courses for professors and teachers were relevant and of high quality. From the document study it is difficult to get a full overview of number of participants at these trainings and its follow-up. It is learned that these trainings were needs based, and by consequence there was much interest of a larger group of researchers. For efficiency reasons it was decided to organise more short training courses in Ecuador, instead of moving all people to Belgium. The documents show that the majority of these trainings were organised at ESPOL.

Two intermediate result domains appeared to be crucial for the development of the master:

(1) *Educational support strategy*: the investment in enhancing capacities in course design, research-based education, the development of a learning package and learning materials that could be easily used and accessed by the professors through the learning platform were important activities. The input from prof. Valcke appeared crucial to that end. A short course on RBL and one on distance education was only foreseen in year three and had been postponed because of conflicting schedules. This course was crucial as many professors were sceptical of teaching through video conferencing. All professors interviewed appreciated a lot the new competencies acquired in course design, definition of learning outcomes and RBL. The extent RBL is being applied varies between professors. Several professors interviewed testified that it is

difficult to implement RBL as they have to follow the guidelines of Senescyt (with a focus on teaching to the detriment of lab and field work). Training on RBL was organised at ESPOL. It seems that the majority of participants were staff of ESPOL. Only a few professors interviewed at U Cuenca and EPN had received training on RBL. Furthermore, also bureaucratic rules at the different universities hampered the swift organisation of field work (more at U Cuenca and EPN than at ESPOL). With the change of professors, refresher courses on RBL are needed (and foreseen).

(2) *Integrated network activities*: time and budget available for enhancing collaboration between the universities was crucial for the success of the project: traveling between universities (face-to-face meetings), getting to know each other, working in group per course, etc. Towards the end of phase 1, less traveling was required as people knew each other, and with the purchase of Polycom less traveling was required (virtual meetings). This traveling seems to benefit above all the focal points at the different universities. However, at the start of the master all professors involved in teaching travelled and worked together during a whole weekend to develop jointly each specific course. It is not yet clear to what extent this enhanced collaboration resulted in more joint research, involving also professors that are less actively engaged in the Network project such as the focal points and network coordinators at each university.

A few factors negatively affected the level of efficiency:

- Internal factors: (i) due to conflicting agendas several short trainings were rescheduled and postponed both in Ecuador and in Belgium, (ii) because of IT problems at EPN the virtual classes were often hampered because of network failure (polycom system purchased for EPN in 2017), (iii) students testified of planning issues whereby professors rescheduled their course without sufficient communication to the students at the other universities.
- External factors: the delay in approval by CES of the revised and adapted curriculum for the second cohort.

Input-output: see assessment at programme level

Time for soft diplomacy and network building, and workload demanded by RBL were underestimated, but because of the willingness and engagement of all staff involved, and in particular of the Network coordinator and focal points results were achieved.

The Network is used as leverage for attracting other funding, but still mainly from VLIR-budgets. A total of nine research proposals were approved for funding (for more than 1,3 million EUR), of which 8 funded by VLIR. From the interviews it is learned that there circulate several ideas of formulating research proposals and look for funding outside of VLIR.

Project management was assessed as excellent by the people interviewed and validated by the evaluators. The inter-institutional academic committee operates well and meets every two-weeks (and more when needed). The system of focal points works well. Guidelines for MSc evaluation were developed including evaluation of RBL application, quality of conference system, use of platforms, use of databases, student-professors interactions, punctuality of professors, etc. The implementation of the master is properly monitored; however, the evaluators had no insight in the quality of the monitoring of the application of RBL (see assessment at programme level.

Sustainability	
4.1 Institutional Score: Low	- Ownership by each of the universities but different levels of commitment - Majority of staff involved are tenured professors - Conditions are in place to support scientific research - Process of international accreditation started - Further development of strategic partnerships with Flemish counterparts and abroad - See challenges regarding sustainability as described at programme level
3.2 Financial Score: Good	- No financial challenges to continue implementing MSc - Availability of research funds (internally and externally) - Opportunities to attract funding from private sector not yet fully explored - Institutional rigidity in managing university funds, not conducive for joint projects

Institutional sustainability – see also assessment at programme level.

No additional information needs to be given that is specific for the MSc in biodiscovery.

Financial sustainability – see also assessment at programme level.

No additional information needs to be given that is specific for the MSc in biodiscovery.

2.2.2. Water Resources Management

In Ecuador, current developmental trends exert an increasing environmental pressure on aquatic systems due to a higher demand of water for extraction and for other environmental services. Agriculture and mining are seen nowadays as the main activities for socio-economic development being strongly promoted by national policies and plans. This increasing water demand taking place under a still developing WRM framework imposes a threat for the sustainability of national water resources if state-of-the-art knowledge, tools and techniques are not applied for a proper management.

Enhancement of local capacities for sustainable WRM is urgently needed to support effective actions towards the development of innovative and integral solutions in this area. Although national universities have developed different strengths and capabilities on WRM, these knowledge and expertise need to be shared in order to provide an integral and multi-disciplinary training for water management professionals.

The development of an inter-university master programme on WRM will increase the understanding of WRM. Strengths and capacities of each partner on higher education and different research fields will be brought together for an integral and multidisciplinary research-based training of water professionals in Ecuador. A significant number of national professionals from the water resources management sector will have the opportunity to participate in short and/or long-term training programmes (e.g. training courses, post-graduate programmes, workshops and seminars, etc.). It is expected that these training activities will offer an opportunity for state-of-the-art knowledge and technology transfer towards academics, practitioners and decision makers, increasing the expertise in the water sector. The final developmental aim is to promote the implementation of current knowledge and techniques for water resources management in Ecuador.

Similarly, to the master in biodiscovery a set of six intermediate result domains were identified (see previous chapter), which shows that the intervention logic of the two projects is very coherent, enabling the organisation of network activities involved stakeholders of both projects.

	Hosting Faculty	Number of staff involved (% with PhD)	Number of students	Number of publication in peer reviewed journals
ESPOL	Faculty of Natural Sciences and Mathematics	18 professors (100% with PhD)	1	15
U Cuenca	Faculty of engineering, department of civil engineering PROMAS (Programa para el manejo de agua y suelo)	17 professors (65% with PhD)	13	4
EPN	Faculty of civil engineering and environment	19 professors (63% with PhD)	3	3 publications
UTN	Faculty of engineering in agricultural and environmental sciences	3 professors (33% with PhD)	/	2 publications

Following table provides an overview of the results in the Key Result Areas, as per 2017.

KRA	Indicators (target)
Research	By the network member, 12 joint articles published in international peer reviewed journals. 11 conference contributions were presented by PhD and MSc students. Joint research agenda established on the national conference on WRM, organised by ESPOL. Three joint research proposals were approved by funding agencies (VLIR).
Teaching	Inter-University master programme on WRM developed and accredited by CES in 2014 for two years. One cohort of 19 students has started in 2015. A new proposal of master course needed to be presented at CES for approval (pending). Second cohort can start once approval is obtained. All master theses are co-directed by researchers of different VLIR-Network universities. RBE is being applied by all professors and supported by case studies. Annually 3 to 4 field visits are carried out, involving researchers, PhD and master students from Network universities and Flemish counterparts. Case studies have been done in all regions of Ecuador, including the amazon river basin, Yahuarcocha lake, Chambo river basin, Cuenca river basin, Portoviejo river basin, Guayas basin, and Galapagos island. Case studies are integrated in course material, PhD and master research and used for publications. Joint field monitoring exercises were carried out by ESPOL and UTN, with participation of Flemish students and undergraduate students of UTN (with the intention to include RBE also in undergraduate courses at UTN).
Management	A procedure manual for the management and development of the inter-university master was developed. Research protocols for master theses developed. Field protocol for river bio assessment was developed and applied by students. The Sidweb platform, being used by ESPOL, was chosen as the e-platform for course content management. Annually a workshop is organised at Network level to evaluate course content and application of RBE and discuss micro-curriculum development for the next year. An academic committee was created with participation of focal points at each university to monitor the development of the master and its implementation. The committee meets every two months. Once a year the international steering committee is evaluating the project. Scholarship policies established at ESPOL and EPN.
Human resources development	Two students from network universities started PhD course at Flemish universities. Other PhD student involved in the Network also started and were supported by the Network, like for the purchase of equipment and research materials. Short training courses provided in Belgium: - 2013: 6 staff members of the network universities have received a short training in Belgium - 2014: 1 tenured prof. at EPN performed a short training at U Gent, 2 research assistants at UTN performed a short training at KUL - 2015: 1 senior researcher at U Cuenca performed a short stay at U Gent, 1 senior researcher of ESPOL at KUL and 3 senior researchers of EPN at VUB Short training courses provided in Ecuador:

	- More than 50 professors trained on RBE at ESPOL and Cuenca: annual training workshops. In 2015 given by M. Valcke (UGent) in Cuenca and locally replicated at EPN and UCuenca. - Workshop on experimental design at U Cuenca (2014) for 10 participants, by Ziv Shkedy (UHasselt) - Seminar on 'Nitrate source identification in water bodies via istopic fingerprinting' (July 2016) by Pascal Broecks (UGent) 3 prof from the Network universities participated in the VLIR Training workshop in Vietnam on tools for research assessment and education in the field of WRM 2 students from HoGent perform their thesis based on network research. Travel grants from the Network budget to support participation of Flemish students at Network events in Ecuador Two PhD students with Senescyt scholarship to study in Belgium (complementary funding provided by the network programme.
Infrastructure management	Purchase of video conference equipment at ESPOL, U Cuenca and EPN. In each university a specific classroom is assigned for the master course (also at UTN). GIS and Groundwater models licences purchased for the network Equipment of laboratories: - EPN: equipment for field work and sensors, water quality probe - ESPOL: equipment for field work - U Cuenca and UTN: analytical facilities - 2 fluorometers for Chlorophyll and toxic algae measurements in marine and freshwater - Digestion block for water quality analysis - Sampling nets for zoo and phyto-plankton
Mobilisation of additional resources	Three research proposals approved for funding by VLIR. Two international cooperation and research programmes on WRM approved (ARES and Erasmus +)
Extension and outreach	Leaflet and web page on the master programme Two training and information videos on sustainable water management developed (graduation projects of students of audio-visual production at ESPOL) but funded by NSS VLIR initiative for the production of e-learning materials. A survey to assess the local existing knowledge and capacities has been elaborated in 2014 of which the results were published in 2015. The survey was crucial for the elaboration of a REDU-proposal to establish a national network on integrated management of water resources. Conferences, workshops and seminars: - Workshop for Network universities, representatives of Vietnam VLIR-Network and from public institutions (June 2014) with presentation of Peter Goethals (U Gent) - Yearly international workshops on WRM at ESPOL. In 2016 participation of international speakers was funded by the Network. - VI workshop of civil engineering at EPN (October 2015): network members presented their research, representatives of ministries and secretaries in the water sector were present as well as other universities. Foundation was established to create a national level university network on water research. - Seminar on sustainable management of the Guayas basin and estuary, at ESPOL (October 2016)

Relevance	
1.1 Responds to needs Score: Excellent	- National 'Buen Vivir' policy pays due attention to academic collaboration, the development of a qualitative higher education system with a specific focus on science and technology and stimulates multi-disciplinary research. - WRM has always been an important topic in Ecuador and is a key thematic area in the national 'Buen Vivir' policy. - A market study was done to assess demand and offer from such a MSc in WRM. The study revealed that an interest exists among possible students and that the labour market is looking for such profiles. - Choice for research topics is influenced mainly by the interests and competencies of the researchers, but attempts are being made to involve external stakeholders (private and public) in identifying research topics, but still limited and differences between universities. - External stakeholders had no influence on curriculum development[9] - Four universities have complementary expertise - The development of a MSc and application of RBL is in line with the educational reform processes in Ecuador - The project is fully consistent with the VLIR-UOS country strategy - The Network programme addresses explicitly transversal themes of the Belgian development cooperation such as environment and D4D (e.g. virtual class rooms, digital platforms, and alike). No specific attention for gender.
1.2 Synergy	- The project builds further on the results achieved of the former IUC's at ESPOL and U Cuenca. During the first phase, efficient use mas made of resources available (incl. professor's mobility) to align activities developed within the IUC with U Cuenca and the VLIR Network. - The collaboration within the VLIR Network has resulted in the development of several research proposals, together with the Flemish partners, of which some are presented at VLIR. Several VLIR-projects are mutually strengthening each other. Other Flemish universities (e.g. u Antwerp) are looking for possible collaboration and joint research. - Synergy is mainly looked for within the VLIR-context. Not much synergy is looked for with other (Belgian) donors/actors, except with ARES.
1.3 Coherence Score: **Good**	- The intervention logic is coherent and the choice of activities is relevant for obtaining the results and objectives. - Focus of the strategy is the development and implementation of the MSc in WRM. Less attention is given to the institutional changes needed within each university. A lot of soft diplomacy was conducted that was needed to obtain the results, but not formally included in the intervention strategy. - The project responded flexibly to changes in the context (e.g. new regulations for MSc developed by CES)

[9] The current legislation demands the MSc programmest o establish an advisory board with representatives from the private and public sector. Such a committee is being established with representatives of SENAGUA, the Ministry of Envrionment and local water companies (like Interagua and Etapa).

The project on WRM is highly relevant in the Ecuadorian context and builds on previous attempts for inter-university collaboration on WRM between U Cuenca, ESPOL and EPN. A joint master in WRM, developed by ESPOL and U Cuenca, had already been presented before at CES but did not receive approval. The Network project has improved the original proposal.

The project is aligned with the VLIR-UOS country strategy for Ecuador, which established that Water Quality and Quantity are topics of academic and scientific interest under the broad field of the Biodiversity/Natural Resources themes. The strengthening of the academic capacity in the area of water management is also aligned with governmental policies establishing the sustainable management of water resources as a national priority (Buen vivir).

Specific expertise of each of the Network universities could be used to look for appropriate solution for the different environmental settings, which demand customised solutions, depending on geographical specific location and needs.

Contrary to the MSc on biodiversity, the universities involved in the MSc in WRM had more established relationships with external stakeholders. From the project documents it was learned that the Research Institute for Development (IRD) is supporting three research projects at EPN on WRM related areas. The NGO Nature Conservancy has supported the establishment of water funds on different basins of the region. FONAG (Water Protection Fund) and FONAPA (Water fund for the Paute river basin) are examples of fiduciary water funds for watershed protection in Ecuador. The Ministry of Environment (MAE) is closely working with ESPOL on an analysis of gap/overlap competences among governmental institutions for watershed management in Ecuador. The U Cuenca is closely collaborating with public institutions such as ETAPA and Elec-Austro, among others to implement joint research projects. In fact, ETAPA also has proposed subjects for master theses. Nonetheless the closer collaboration with several external public and private actors, they have not been consulted during curriculum development.

The collaboration within the VLIR Network has resulted in the development of several research proposals, together with the Flemish partners, presented at VLIR. Several VLIR-projects are mutually strengthening each other. Synergy was also looked for with an ARES funded project, ParamoSus (2016-2021) that involved EPN and U Cuenca (and UCL and U Namur). One of the PhD students supported by this project is a lecturer in the MSc on WRM. The project also foresees two scholarships for master students, which will be assigned to two students that will start in the second cohort. Furthermore, three non-Ecuadorian PhD students have conducted their PhD on local cases in Ecuador, funded by Flemish international cooperation.

The transversal themes of the Belgian development cooperation are also relevant for this project. The themes of environment and D4D are evidently addressed in the project. According to the project document specific attention would be paid to gender[10] but no specific actions are known by the evaluators. It would have been interesting to look for strategies to attract female students for a male dominated career and as such increasing the participation of women in science technology and innovation.

[10] Empowering women in research environments during the implementation and operation of the two masters' programmes, reconciling the academic and the private life of women when necessary (pregnancy, maternity, etc.), promoting also gender and scientific excellence, promoting research in the domains of the programme associated to gender.

Effectiveness	
2.1 Academic Score: excellent	- Development of MSc in WRM, accredited by CES - Adaptation of the curriculum to the new regulations of CES (approval pending) - Application of RBL - 19 students in first cohort (but dominance of U Cuenca) - MSc WRM institutionally integrated in the administrative systems of each of the network universities, still some bottlenecks at EPN[11] - Culture of team work and collaboration established, within participating faculties and between the Network universities - Strengthened research groups at each university - Students having access to experts in diverse domains - All students supported by a promotor and a co-promotor from different universities
2.2 Development Score: Good	- 3 out of the 17 students and alumni interviewed (18%, indicator was 50%) were working outside the university at the start of the master (2 sent by ETAPA, 1 working for a private consultancy company). - Various case studies and field work, monitoring water quality and looking for appropriate solutions. Concrete cases integrated in courses - Several workshops that are accessible for public institutions and government actors active in the water sector - Some evidence of knowledge uptake by external stakeholders
2.3 Scientific quality Score: Excellent	- 78% of professors teaching in the master have a PhD (7/32 with master degree) - All students, except the staff from ETAPA, aim an academic career and most of them would like to do a PhD. - 12 publications have been produced in international peer reviewed journals - 19 students of the first cohort have presented their thesis before a scientific committee and have been recently graduated. - Scientific research lines developed and implemented

The academic objective has been realised. The joint MSc was presented at CES in 2013, at the same moment as the MSc in Applied Biosciences. After two revisions and presentation of adapted programme proposals, CES granted the authorisation for the MSc on WRM on October 22nd in 2014. For this master, more time needed to be taken for programme promotion and organisation of the admission process as compared to the MSc in biosciences, resulting in a later start of the first cohort (September 2015).

Also, a revised curriculum for this master needed to be presented at CES, after the changes in regulations in 2016. This approval is still pending but expected to be awarded soon.

For the first cohort 19 students were finally selected, of which 15 are following the master at U Cuenca. This in-balance can be explained by the fact that the university of Cuenca has already a history in organising research-based masters for WRM. Previous MSc had stopped and were replaced by the current master. Difficulties at EPN (staff changes, bureaucratic bottlenecks) might have hampered also the promotion of the master. At ESPOL 5 students had shown interest of which three were eventually selected. One student dropped because of lack of time for the full-time master and the second student left because of financial problems. From the interviews it was learned that more alumni were interested to

[11] After the latest meetings with EPN authorities, it is expected that internal administrative procedures will be adapted in order to support the programme for a successful implementation during phase two.

join the master but had not been properly informed about the opportunity. There might be more interest for the second cohort (as also was the case in the MSc on Biodiscovery).

Contribution to the **development objective** is yet to be seen. As is the case for the MSc in Biodiscovery all students, except those sent by ETAPA, see the master as a step in their academic career. The majority of the students were either working at the university (as lab or research assistant) of recently graduated from pre-graduate studies.

As described at programme level, the evaluators have not seen a strategy to disseminate research results to professionals in the field or to develop structural relations with relevant actors in the private and public sector. However, contrary to the project on biodiversity, there exist already several structural relationships with public and private actors and the universities involved. Relating to water companies, such as ETAPA, seems easier in Cuenca and Quito as ETAPA is a public company whereas in Guayaquil these are private companies and collaboration seems more difficult. However, several communications were needed with government agencies to obtain permits for field work (in all regions). These actors have been invited for several workshops organised by the Network to present results from research. Furthermore, Senagua is currently working on the development of a biomonitoring manual for water quality assessment in Ecuador and researchers involved in the network programme are providing advice to that end.

From the interview with ETAPA it is learned that six months is too short for a comprehensive research project, resulting in the suggestion to develop a research line to which students of several cohorts can contribute.

Scientific quality – The research groups at the participating universities have been further strengthened. Researchers can rely on master thesis students which also contribute to a higher number of publications. Several PhD students are linked to the Network research lines. All partners in the Network, within Ecuador and in Belgium, look for funding to stimulate student and researchers' mobilisation. Students from Belgium are doing internships in the Network universities and link their master thesis to research subject of the Network. Students have presented their research results before the scientific committee composed by researcher of the Network universities and researcher have presented their research in several workshops. The Network also enabled the invitation of an international speaker at yearly organised international workshop on WRM at ESPOL, in 2016. A joint research agenda was adopted at the national conference on WRM in 2014.

Competences of researchers also have been further strengthened, through the joint collaboration, the short courses provided by Belgian professors in Ecuador or in Belgium, the further equipment of the laboratories and the funding attracted for (joint) research. The Network Universities comply with the requirements of having at least 70% of teachers in the master course with a PhD.

A research protocol for field work (for river bio assessments) was developed and applied by the students. A research topic database was developed. Five joint research proposals were approved for funding, three by VLIR, one for Erasmus + and one for AERES.

Efficiency	
JC. 3.1 Intermediate results Score: good	- All intermediate results have been implemented and targets were realised as planned (see overview in table on KRA) - Inter-institutional PhDs in WRM (one on Integrated modelling of the water quality of the Cuenca river systems, and one on Technical and ecological considerations for the design, operation and implementation of ICWs) - Some delays in implementation due to internal and external factors. Delays have been properly managed
JC. 3.2 relationship input-output Score: Excellent	- Relatively cheap project with lot of results - Time for soft diplomacy and network building and workload demanded by RBL was underestimated - Relevant identification of advisory support demanded from Flemish counterparts - Underspending in the first years justified by the progress of the project - Flexible use of available budget - Network used as leverage for attracting other funding, but still mainly from VLIR-budgets
JC. 3.3 Project management Score: Excellent	- Good working relationship with other universities and coordinating hub (ESPOL) - Clear management guidelines, division of roles and responsibilities - Reporting requirements respected by all universities - Transparency/communication in budget spending can be improved - Factors hampering efficiency have been managed well

Intermediate results – have to a large extent been achieved (see table KRA). The project was well developed, planned and monitored. Not all targets were fully realised but without having a negative effect on the realisation of the objective, the lack of scholarships excepted. During project implementation a scholarship policy was developed at ESPOL and EPN, providing scholarships from own resources to master students. At EPN the three master students were hired as assistant-professor for first-level engineering courses, allowing them half-time dedication to their master studies. At ESPOL, the student following the programme received a research scholarship for thesis related costs. This is seen as a good practice by the focal points of U Cuenca, willing to develop a similar policy for their own university.

Also, the students of this master complained about the costs for the internships and fieldwork outside of their universities.[12] Also one students interviewed testified that he wanted to do its thesis on a subject within the expertise of a professor working at another university. As this required more traveling, he preferred to choose a topic within the domain of expertise of its own university.

A limited number of senior researchers and research assistants performed a short training in Belgium (total of 14). Two thematic workshops were organised, one at ESPOL and one at U Cuenca. Topics of interest were defined based on discussions during Network meetings. There is no information on the

[12] Transportation costs for field activities were covered by the programme. In case of overnight in situ, students paid for their accomodation and subsistence. In cases of short research stay at a Network university, accomodation was provided at residence rooms of the university when available.

follow-up. Current instability of administrative and technical staff at public institutions complicates the process of follow-up and tracking of the impact of the received training in the respective institutions.

A strong feature of this project is the application of RBL. More than 50 lecturers were trained on RBL at ESPOL and in Cuenca, and these workshops were annually replicated. RBL courses were developed related to hydrology, hydrogeology, ecological modelling, hydrological modelling, stream bioassessment, remote sensing. Course material was based on the case studies conducted in the different river basins. Several field visits and case studies were organised (e.g. sampling campaigns for environmental data collection for aquatic ecosystems assessment and modelling), which results were integrated in the course material. Students participated in the field sampling campaigns. At the end of each semester workshops were organised to review the course material and to further harmonise micro-curricular content of the courses. Course material was also inspired by the training received at the Flemish universities. Professors interviewed were enthusiastic about this approach.

As for the MSc in biodiscovery, lecturers experienced more problems with the virtual classroom, due to internet connection problems at EPN and the lack of appropriate virtual classroom software (Polycom purchased in 2017). Also, at UCuenca a virtual classroom station needed to be purchased to replace the older Polycom desktop-based platform. Also, for this master, students testified of planning issues whereby professors rescheduled their course[13] without sufficient communication to the students at the other universities and of varying level of quality of the different lecturers (less feedback, less interaction, less connection theory and practice).

Another strong feature of this project is the integrated network activities. Time and budget available for enhancing collaboration between the universities was crucial for the success of the project: traveling between universities (face-to-face meetings), getting to know each other, working in group per course, etc. Furthermore, the Network universities and their partners involved Flemish students and Ecuadorian PhD students to the research being conducted in the Network. Through the inclusion of the EUROINKA programme, student mobility of students from ESPOL and the EU was promoted and linked to the Network activities. The Network provided complementary funding to purchase equipment, materials and reagents for doctoral research and funds were looked for to enable participation of Flemish students in Network activities. Also, internally, a research assistant from UTN performed a short stay at ESPOL for the development of his thesis.

Finally, a VLIR N-S-S initiative has supported the project in the development of e-learning materials that are accessible by all Network partners (though not yet widely known by lecturers interviewed).

Input-output: see assessment at programme level

Although a yearly rotation scheme for the investment fund was originally proposed, acquisitions were finally prioritised in terms of network activity planning. The evaluators did not hear any complaints on this agreement during interviews.

Project management was assessed as excellent by the people interviewed and validated by the evaluators. The inter-institutional academic committee operates well and meets every two-weeks (and more

[13] At the start of the master the academic following-up systems did not consider yet the classes given in the master courses as part of professors'time-load.Further regulations now consider the time-dedication of professors involved in the master within their time-load, therefor being monitored by the academic follow-up systems and evaluated by students, which should improve planning of the courses.

when needed). The system of focal points works well. Guidelines for MSc evaluation were developed including evaluation of RBL application, quality of conference system, use of platforms, use of data-bases, student-professors interactions, punctuality of professors, etc. The implementation of the master is properly monitored; however, the evaluators had no insight in the quality of the monitoring of the application of RBL (see assessment at programme level).

Sustainability	
4.1 Institutional Score: low	- Ownership by each of the universities but different levels of commitment - Majority of staff involved are tenured professors - Conditions are in place to support scientific research - Further development of strategic partnerships with Flemish counterparts and abroad - See challenges regarding sustainability as described at programme level
3.2 Financial Score: Good	- No financial challenges to continue implementing MSc - Availability of research funds (internally and externally) - Opportunities to attract funding from private sector not yet fully explored - Institutional rigidity in managing university funds, not conducive for joint projects

Institutional sustainability – see also assessment at programme level.

No additional information needs to be given that is specific for the MSc in WRM, except the fact that there is interest from Colombia to support Colombian students to participate in Ecuadorian programmes (based on a binational agreement between Colombia and Ecuador). There is interest in the master on WRM. Trans boundary watershed management is among the national priorities of Ecuador, Colombia and Peru. Master and doctoral students from neighbouring countries are seen as an opportunity for programme regionalisation.

Financial sustainability – see also assessment at programme level.

No additional information needs to be given that is specific for the MSc in WRM.

3. Conclusions and Recommendations

This VLIR-UOS-Network project is a very successful project that has achieved the creation of a culture of collaboration between four universities in Ecuador, in a highly competitive academic context. This collaboration enables the implementation of joint research-based master programmes in biodiscovery and water resources management and facilitates more joint research initiatives. The programme supports the national reform processes of higher education, through the creation of research-based master programmes and the implementation of research-based learning. Experience was gained in new models for academic curriculum development and course design. The programme can be seen as a good practice that can be shared within the REDU network, in order to stimulate more inter-university collaboration and with CES and Senescyt, to create a favourable environment for inter-university cooperation.

The programme builds further on previous VLIR-UOS interventions and as such contributes to sustaining those results achieved. Furthermore, the Network programme is enhancing the relationships between Ecuadorian and Flemish universities, which can result in more sustainable partnerships. All partners in Ecuador and Belgium have looked for complementary funding to increase staff and student mobility, which resulted in the formulation of new joint research proposals and enhanced participation of master and PhD students and lecturers of different universities involved and others in Network activities.

Several lessons can be learned from this first Network experiment:

- Basic conditions for high level education and research need to be in place (Lecturers with PhD, research group, research friendly environment), which can be the result of former VLIR-UOS interventions.
- Support and commitment form leadership is required. Within each institution leaders need to be identified that are able to invest time and energy to move the project forward.
- Weaker universities can be included in the Network programme but only when there is commitment of leadership to bring the university to a higher level.
- A lot of soft diplomacy is needed to inform the participating universities on the consequences of a joint programme and act accordingly.
- Sufficient time and budget is needed for getting to know each other; this includes traveling between the universities and investment in group work.
- The development of a master curriculum benefited a lot from the advisory support regarding curriculum development, course design and research-based learning. This is not a specific feature of a Network programme. The advantage of a Network programme is the added value of complementary expertise that can be attracted to shape the curriculum. Starting point is not the expertise in one university but the finality of the master course and the needs of the sector.
- The application of virtual classroom teaching is as effective as teaching in real life but requires sufficient training of lecturers and access to reliable equipment and IT connections. It is a solution for distances and costly traveling.

The Network programme has obtained a lot of results in a short period (6 years). The development of a joint doctoral programme in natural resources (including biodiscovery and WRM) is an evident following step and will also contribute to the sustainability of the master programmes.

A second phase will be needed to consolidate the results achieved, maximise sustainability and to up-scale the good practice in order to achieve wider impact. Following recommendations are formulated for the second phase.

1) Strengthening the application of RBL

One of the important features of the joint master programmes is the adoption of innovative educational approaches, such as research-based learning. Most of the lecturers interviewed are enthusiastic about the approach. The content of each course is regularly evaluated, also taking into account the integration of research. However, there is not much information on the application of RBL by each of the lecturers, and on the coherence between the assignments given by the different lecturers involved in a specific course. The evaluation has shown that not all lectures were sufficiently trained in RBL and that some of them might need additional support or coaching.

RBL training still depends on Network funding. Refresher training is foreseen each year. However, to increase sustainability it will be needed to structurally integrate RBL training in the capacity development of the lecturers.

Recommendations for the second phase:

1.1. Invest in further training in the second phase of the project;
1.2. Provide coaching of lecturers in applying RBL, and by extension in virtual classroom teaching and student-centred learning approach;
1.3. Negotiate with the departments for continuous education to integrate RBL in training of lecturers and include this in the capacity development plan;
1.4. Revise existing monitoring tools to follow-up RBL and collect data on its application (and by extension in virtual classroom teaching and student-centred learning approach)

2) Lobby for a favourable environment for (joint) research-based master programmes

A lot of lobby work has already been done, also supported by some of the Flemish Network partners. Lobbying CES has resulted in the revision and adaptation of the national regulations to enable the organisation of joint master programmes, the acceptance and even promotion of RBL and acceptance of virtual classroom teaching. Still there is a long way to go.

CES regulations do not allow full application of RBL and still give preference to in-house traditional teaching hours to the detriment of lab and field work.

The full-time two-year master programmes are not attractive for many students. Apart from financial bottlenecks, also the length of the study period is a bottleneck. The undergraduate programmes already take long (5 years and more) and as the undergraduate and master programmes are not integrated, students can only start the MSc programme after their graduation, which results in a long study period. A solution could be looked for and offered to the best students in order to enable them to shorten their study period and be incorporated in the MSc already during undergraduate studies. This is possible within the current regulation framework (see Itinerary approach), but no one has tried to implement this so far.

Currently, students from weaker universities or interested candidates living in remote areas have difficulties in accessing the master course as they have to move to one of the hosting universities. However, the virtual classroom software also makes it possible to attend the courses at a university, which is not compliant with the requirements of a hosting university. A combination of distance learning with the virtual classroom teaching could be a solution for attracting these students.

Recommendations for the second phase:

2.1. Invest in lobbying CES and develop lobby trajectories for the different lobby topics. One topic is related to the development of a regulatory framework that is in favour of RBL. Another topic is related to the implementation of the policy on itineraries and the opportunities it offers for enhanced articulation between undergraduate and master programmes. Evidently, these are long-term trajectories which will require more than the 4-years of the second phase. But someone has to start.

2.2. Explore opportunities to integrate distance learning in the master and lobby CES for its approval.

3) Invest in up-scaling of good practices

Good practice as experienced in the VLIR-UOS Network is limited to the lecturers and faculties involved in the project. There is not much spill-over to other lecturers and other faculties within each university (more so at ESPOL). Only at ESPOL other research-based masters have been developed. As the national policy on higher education is pushing the universities to develop more research-based masters, there is a lot of potential to expand the experiences gained in this programme. A specific upscaling strategy to that end is needed.

Several initiatives for inter-university cooperation are being taken in Ecuador but they all lack a facilitator or a driving force. The experiences of the VLIR-UOS Network can be shared within REDU. Moreover, as it has become clear that extra incentives are needed to bring this inter-university collaboration to a next level, one can look for opportunities to support inter-university initiatives.

Recommendations for the second phase:

3.1. Invest in the capitalisation of good practices (including those related to curriculum development and course design) as experienced in the VLIR-UOS Network and make them known within each participating university and in the appropriate networks, like REDU and CEDIA.

3.2. Continue lobby activities within each of the universities to adapt systems and procedures in order to accommodate the organisation of a MSc.

3.3. Develop an up-scaling strategy of the good practice for each of the participating universities, taking into account institutional characteristics of each university. Lessons can be learned from the experiences in up-scaling at ESPOL. Be realistic.

3.4. Look for opportunities to strengthen the thematic network on WRM within REDU. More than 11 universities have already signed a collaboration agreement. In a first phase only, external funding will make the collaboration work. Look for possible collaboration with the VLIR-UOS Network WRM project. A possible opportunity might be to link this network with the establishment of the national chapter of the International Water Association.

3.5. Be realistic about the expansion towards other universities. Explore opportunities for joint research and participation in Network activities. Advocate for the acceptance of students form these universities in the MSC through distant learning (see in the above).

4) Invest in establishing contacts with external stakeholders

The collaboration with external stakeholders, both public and private actors is very limited in the VLIR Network programme so far. This has negative consequences for the impact and sustainability of the programme. Currently there is not much uptake from knowledge gained and practical solutions developed for concrete problems related to biodiversity and water resources management.

The labour market has currently limited absorption capacity for students with this high educational profile. Research based masters are very new and nobody has any experience demonstrating that a MSc graduate can perform better/differently. The labour market does not value the MSc programmes higher than a professional master. There are institutions (and individuals) that are eager to invest in specific training and education. However, while the 2 years full-time format of the programmes is good from the university point of view, this format is difficult for most of these institutions.

Recommendations for the second phase:

4.1. Develop a strategy to strengthen collaboration with external actors (involving them in curriculum revisions, identification of research topics, offering internship for thesis students, organisation of Network activities that are relevant for them, etc.).
4.2. Actively promote research being conducted and develop non-scientific material to inform external stakeholders on research results. Look for more collaboration with the departments within each university that are responsible for linking with the community.
4.3. Organise more workshops and conferences open for external stakeholders to make the master courses known.
4.4. Consider the organisation of short courses for practioners, linked to courses and research developed in the master.
4.5. Invite public and private companies to participate in job markets for master students.
4.6. Consider the integration of entrepreneurial and managerial training in the master curricula for those students that aim at establishing their own (consultancy) companies and look for ways to support these students in establishing a private company.

ANNEXES

Annex 1: Terms of Reference (extract from the ToR)

1. Purposes of the evaluation

A mid-term evaluation has 3 different standard purposes:

1. Learning: on the basis of the analyses made by the evaluation team, lessons can be learned about what worked well, what didn't and why. The formulation of these lessons learned will contribute to the quality of on-going and future NETWORK programmes in terms of the content and management of the programme, including the overall policy framework.
2. Steering: on the basis of the analyses made by the evaluation team, recommendations will be formulated to support decision making processes of the NETWORK (at different levels). For a mid-term evaluation specifically: The evaluation will be used to decide about - and as an input for - the formulation of a second phase;
3. Accountability: by independently assessing the performance of the NETWORK programme (and validating or complementing the monitoring), different actors (HEI, VLIR-UOS, etc.) can fulfil their accountability requirements.

2. Specific evaluation objectives

The evaluation's primary objective is to evaluate the performance of the NETWORK (programme level and project level). This is the basis of every NETWORK evaluation. Next to this objective, final NETWORK evaluations also analyse the prospects for the post- NETWORK period:

A. The performance of the NETWORK needs to be evaluated on the basis of the OECD-DAC criteria for development evaluation (+ one additional criterion): **scientific quality, relevance, efficiency, effectiveness, impact,** and **sustainability**. For mid-term evaluations, a particular focus needs to be given to **efficiency** and **effectiveness**

B. In case of a mid-term Evaluation: The follow-up plan of the programme for the second phase (cf. self-assessments) is also evaluated. The follow-up plan needs to further guarantee capitalisation, exploitation and vulgarisation of achievements of the first phase, sustainability at institutional level (and research groups), and the impact of the university on development processes in the surrounding community, province and eventually in the country.

Next to these standard objectives, this mid-term evaluation also has the following, specific, objective(s):

A. The post-IUC NETWORK programme aimed at bringing former IUC cooperation to a next level of national (and even international) interuniversity cooperation around a priority theme for local/global development. How do you consider the level of contribution given to this level of change/development (broadening)?

B. Have the partner universities taken ownership of the NETWORK programme (e.g. did the NETWORK result in clear cooperation MoUs between local partner universities)?

3. Evaluation criteria

As mentioned, the evaluation will use the OECD-DAC criteria (+ a criteria on scientific quality) as criteria to evaluate the NETWORK: **scientific quality, relevance, efficiency, effectiveness, impact,** and **sustainability**. Any priorities regarding criteria are mentioned in 3.2.

Below a brief definition of the criteria is provided and the interpretation of the different criteria (at programme level and at project level) is provided through the formulation of a number of questions/descriptors that specify the VLIR-UOS interpretation of the criteria. These descriptors are indicative. It is up to the evaluators to develop a more detailed set of sub-questions to assess the criteria.

The different criteria need to be analysed and assessed by the evaluators. They also need to provide a score for every criterion using a four-point evaluation scale. The scale is as follows:

1 = (very) poor
2 = insufficient/low
3 = sufficient/good
4 = very high/excellent

These scores - expressing in quantitative terms an overall and synthetic yet differentiated qualitative judgement - should facilitate the task of evaluation and should be applied for the NETWORK programme level and for each project within the NETWORK programme.

Programme level

Criterion	***Descriptors***
1. Relevance	*"The extent to which the objectives of a programme are consistent with beneficiaries' requirements, country needs, global priorities and partners' and donors' policies."* The extent to which the programme is addressing immediate and significant problems and needs of the concerned partners (institutional) as well as regional and national policy makers, with reference to the MDGs, PRSP and other multilateral policy documents. **Synergy and complementarity with other (Belgian) actors. Link with transversal themes of Belgian development cooperation: gender, environment and D4D)**

2. Efficiency	"*A measure of how economically resources/inputs (funds, expertise, time, etc.) are converted to results.*"
	
	• Sufficient "economy" considerations by the programme
	• The use and application of the means earmarked for collaboration.
	• The **management** of the programme both in Flanders and locally:
	  ○ results-orientation of management
	  ○ cooperation between all parties involved (between projects and programme level, between projects, within projects, between programme and local university)

	○ quality of communication between all parties involved (between projects and programme level, between projects, within projects, between programme and local university) ○ External communication
3. Effectiveness	*"The extent to which the programme' s objectives are expected to be achieved, taking into account their relative importance."* • Overall effectiveness of the programme, taking into account the attainment of specific objectives at project level • changes in awareness, knowledge, skills at institutional level • changes in organisational capacity (skills, structures, resources)
4. Impact	"*Potential positive and negative, primary and secondary long-term effects produced by the programme, directly or indirectly, intended or unintended.*" Not just actual but also (given time limitations) potential impact. ▪ Added value of the NETWORK programme for the institutional performance of the university ▪ Policy changes at institutional level? Changes in behaviour at institutional level? ▪ Added value of the NETWORK programme for the role of the university as a development actor ▪ the extent to which the collaboration has sparked other departments to initiate interuniversity collaboration, joint capacity building, fund raising etc. ▪ the extent to which the collaboration has led to joint developmental activities or similar collaborative models at the regional level ▪ the extent to which the collaboration has raised interest of policy makers and academics, and how the partner university is called upon or is pro-actively developing collaboration models that could be fed into policy advice
5. Sustainability	*"The continuation of benefits after the programme have been completed."* Financial, institutional and academic sustainability: • co-funding by the partner university (matching funds) • incorporation of costs into the budget of the partner university • the partner university sets aside funds for operations and maintenance of physical infrastructure • Ability to attract external funds • Ability for full financing or co-financing events, workshops, congresses, mobility, grants, investments, infrastructure • Strengths and weaknesses of the institution in terms of institutionalising the collaboration • Intensification and/or formalisation of interuniversity consultations (North-South and South-South)

	• Ability to produce joint proposals (fund raising, research) • Collaboration and exchanges outside of VLIR-UOS-programme • Curbing brain drain into sustainable brain circulation, installing incentives, "pull factors" against "push factors"

Project level

Criterion	*Descriptors*
1. Scientific quality	*"The extent to which a project has a ground-breaking nature and ambition (excellence)."* ▪ quality of **research** : the extent to which research - sufficiently involving stakeholders - is cutting edge; Extent to which the results have been incorporated in local or international refereed journals ▪ quality of **education** : the extent to which new education practices – developed while sufficiently involving stakeholders - are cutting edge; Extent to which alumni easily get a job which fits their education profile; the number of fellowships acquired from foundations
2. Relevance	*"The extent to which the objectives of a project are consistent with beneficiaries' requirements, country needs, global priorities and partners' and donors' policies."* The extent to which the project addresses immediate and significant problems of the community, looking at the amount of self-finance, demand from state and private actors, the level of transfer of know-how and technology. **Synergy and complementarity with other (Belgian) actors. Link with transversal themes of Belgian development cooperation: gender, environment and D4D)**
3. Efficiency	"*A measure of how economically resources/inputs (funds, expertise, time, etc.) are converted to results.*" • The extent to which intermediate results (outputs) have been delivered • The relationship between the intermediate results and the means used to reach the intermediate results. • The relationship between the objectives and the means used to reach the objectives. • Efficiency of project management (e.g. the extent of flexibility during implementation)
4. Effectiveness	*"The extent to which the programme's objectives are expected to be achieved, taking into account their relative importance."* • the degree to which the specific objectives have been achieved • the "use of outputs" • changes in behaviour • the extent to which the university/faculty/department has created the conditions for impact (e.g. by facilitating uptake)

5. Impact	"*Potential positive and negative, primary and secondary long-term effects produced by the project, directly or indirectly, intended or unintended.*" Not just actual but also (given time limitations) potential impact: ▪ Upscaling of new knowledge/applications/services by communities/governments/organisations ▪ Impact on internal performance of involved academics/departments - renewed curriculum functions as example for other universities/departments - the new style of teaching has become a model for teaching (e.g. the systematic use of teaching in combination with laboratory work) - the library has experienced a clear increase in number of visitors ▪ impact at the level of the private sector : the amount of money earned on the market ▪ the extent to which academics, involved in the project, are called upon by the government for policy advice
6. Sustainability	*"The continuation of benefits after the programme have been completed."* Especially financial and institutional sustainability: ▪ Measures for staff retention of trained staff ▪ (potential) synergy and complementarity with other actors (e.g. in extension), local and Belgian actors in particular ▪ do the Flemish universities (and university colleges) commit their own university funds to the programme, for instance by giving fellowships or by allowing academics to go to the field ? ▪ personal commitment of academia? ▪ availability funds for operations and maintenance of physical infrastructure ▪ are there joint research projects which are interesting both to the Northern and Southern academics involved ? ▪ do the partner universities also commit their own funds to the programme (matching funds)?

4. Methodology and data collection

The evaluators are expected to detail an overall methodology for the evaluation in their inception report, taking into account the elements (information sources/data collection) mentioned in this chapter (and the methodologies already developed in the earlier offers in case of a framework contract) This methodology needs to be in accordance with the evaluation objectives, taking into account the context of the intervention and the budget of the evaluation.

Information sources

Prior to its mission the evaluation team will receive from VLIR-UOS, apart from basic information on the NETWORK Programme, a number of documents relating to the respective NETWORK partnership, such as the university strategy paper, the NETWORK partner programme, annual reports, management manual, etc. Two other information sources will also be included:

The Logical Framework

The logical framework and its indicators will serve as the main reference document to assess progress towards the objectives and results formulated.

Self-assessment reports

The stakeholders in a given NETWORK partnership are invited, prior to the mission of the evaluation team, to make a self-assessment and to report on it to the evaluation team in the form of a number of self-assessment reports.

The objectives of the self-assessment are manifold :

a. Reporting against the **logical framework**;
b. Analysis of progress made and achievements;
c. Consolidation and/or completion of Key Result Areas;
d. **Reflection** about the sustainability, partnership, lessons learned, the follow-up of the programme,…

The following 4 **formats** will be used in the context of the NETWORK evaluations. These formats have been refined and consolidated:

- format n° 1 : self-assessment per project
- format n° 2 : collective self-assessment North
- format n° 3 : collective self-assessment South
- format n° 4: self-assessment partner university level

Data collection

Data collection will be done on the basis of available documentation and on the basis of interviews and visits (see below). Furthermore, the evaluators are invited to strive to triangulate data as much as possible (using methods described in the inception report). If data on crucial indicators is unavailable, evaluators are invited to collect that data to substantiate their findings.

Focused interviews with all stakeholders

The evaluation team leader will interview the Flemish programme coordinator, the Flemish project leaders and the Institutional coordinator for University Development Cooperation of the Flemish coordinating university (ICOS) in Brussels. The evaluation team members will also visit the partner university where they will have focused discussions with the stakeholders of the IUC partnership.

The interviews will be preferentially face-to-face but classical (group) interviews (e.g. students, authorities,…) are possible as well. Exceptionally, unavailable persons may be interviewed by telephone, E-mail, or by sending a questionnaire.

It is left at the discretion of the evaluation team to choose the right interviewing method and data analysis methods.

Visits

The evaluation team needs to visit the relevant facilities at the coordinating university (ESPOL, indicatively 2-3 days). The evaluation also needs to foresee targeted visits to the other partner universities (1 day for each of the other universities: UCuenca, EPN Quito and UTN Ibarra). Furthermore time needs to be foreseen for stakeholder visits and debriefing.

In the context of the evaluation methodology for the NETWORK evaluations a separate meeting will be held in Brussels with the international expert in order (i) to brief on VLIR-UOS, its programmes on university development cooperation, and the respective NETWORK partnerships and (ii) to allow discussions with the respective Northern stakeholders.

5. Actors involved

General

The following actors will be involved in the evaluation. All of them have an important stake in the evaluation:

- the VLIR-UOS secretariat;
- the stakeholders (both in Flanders and in the partner country) involved in the ongoing NETWORK cooperation programme;
- the members of the evaluation team;
- the Direction General for Development Cooperation (DGD), i.e. the Belgian government administration for international cooperation
- other relevant stakeholders;

The evaluation team

The evaluation is to be undertaken by both members of the evaluation team.

One expert will act as team leader. In this capacity he/she will lead the meetings that have been programmed and will coordinate the report drafting. He/she will be invited to use his/her experience with international cooperation in the field of higher education and research as reference for the evaluation, especially when formulating recommendations for improvement of the global set-up and management

The following expertise need to be represented in the evaluation team:

- International development expertise: knowledge of and experience with processes of development cooperation, capacity building and methodological issues in general and in higher education in particular;
- A solid experience with and expertise in evaluation
- Country expertise: knowledge of and experience in the local context and the higher education and research system.

The following attribute is considered an advantage:

- Academic expertise regarding the core theme(s) of the partner programme such that the academic quality may be assessed

The above fields should be accommodated by the joined and complementary expertise of two external evaluators. These experts should be neutral. This means that evaluators (1) have not been involved in the implementation of the intervention being evaluated (2) and have no contractual relationship, now or in the past, with any of the partners involved with the project/programme under review.

The Northern stakeholders involved in the ongoing NETWORK cooperation programmes

What is meant by the Northern stakeholders is : all persons from the Flemish universities or university colleges who are involved in one of the ongoing NETWORK cooperation programme. This means: the top management of the Flemish coordinating university, the Flemish coordinator, the Flemish project leaders and team members, Ph.D. student promoters, the Institutional coordinator for University Development Cooperation (ICOS) of the Flemish coordinating university, the financial officer(s) of the Flemish coordinating university, VLIR-UOS programme officer, students, Belgian development actors, etc.

The Southern stakeholders involved in the ongoing NETWORK cooperation programmes

What is meant by the Southern stakeholders is: all persons from the partner university and the local government(s) and community who are involved in the respective NETWORK partnership. This means:

- the top management of the partner university, the authorities at faculty level, the local coordinator, the programme manager, the local project leaders, their deputies (if applicable) and team members, the staff of the local coordinating unit of the NETWORK programme (secretaries, accountants, …), the students funded by the programme, the student supervisors and/or promoters, technicians, staff from other donor-sponsored cooperation programmes being implemented at the partner university, etc.;

- representatives from central, regional and local government agencies and from civil society (e.g. local chambers of industry, employers' association, ...), officials of the Ministry of Education and of Foreign Affairs, and of the Belgian Embassy, ...

The VLIR-UOS-secretariat

The VLIR-UOS-secretariat will function as organiser of the evaluation, as well as resource centre for the evaluation team. The evaluation team will be closely assisted by the programme officer of the respective NETWORK programme within VLIR-UOS (cfr. M&E Policy and VLIR-UOS Evaluation guidelines).

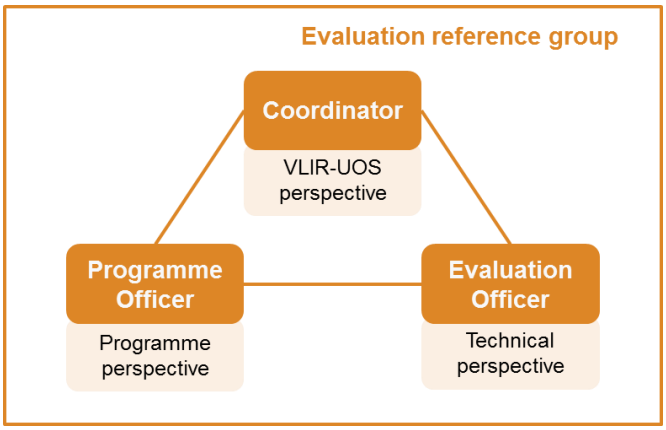
DGD

The Directorate General for Development Cooperation, will be invited to be interviewed by the evaluation team and, if so desired, to participate in a debriefing meeting with the evaluation team.

6. Organisation of the evaluation

Management of the evaluation

1. Every evaluation is managed as a project, including a governance structure that is set-up for a given evaluation. This structure – the **evaluation reference group** – has three roles[14], representing three different perspectives. These roles are assumed by the coordinator, a programme officer and the evaluation officer. Their task is to facilitate the evaluation process. The reference group can be expanded at any time in order to ensure one or more of the three perspectives. The evaluation team will be closely assisted by the programme officer of the respective NETWORK programme within VLIR-UOS (cfr. M&E Policy and VLIR-UOS Evaluation guidelines). The reference group reports to the executive board of VLIR-UOS called Bureau UOS (BUOS) which makes the final decisions (approval report, management response).



2. The evaluation team will be composed by 2 evaluation experts. The evaluation team will receive from VLIR-UOS, apart from basic information on the NETWORK Programme, a set of documents relating to the respective NETWORK partnership for the desk study.
3. The Northern and Southern stakeholders of each of the ongoing NETWORK cooperation programmes received the formats for the self-assessment reports on **11 September 2017**. The reports will have to be submitted to VLIR-UOS-secretariat at the latest before **15 December 2017**.
4. The partner universities will be invited to draft the programme of the evaluation missions, in consultation with – and taking into account the possible requests formulated by - the evaluation team.
5. The evaluation team (or one of the experts) will conduct interviews in Flanders. The methodology of the evaluation will be refined in consultation with the VLIR-UOS-secretariat
6. The evaluation team will submit an inception report at least 2 weeks before the field mission.
7. The field mission will be organized in consultation with the main stakeholders between **29 January and 9 February 2018 (tentative date)**.
8. At the very end of the mission, the evaluation team will discuss its preliminary conclusions and recommendations at length with the Southern and any present Northern stakeholders.
9. The evaluation team members will submit a draft report **after their return from the mission**. A debriefing will be organized during which the highlights of the evaluation are presented. The draft report will be submitted, for comments, via VLIR-UOS, to the resp. Flemish and local coordinator. It will be up to the two coordinators to coordinate the reactions to this draft report. The evaluation team

[14] Draws on "Managing successful projects with PRINCE2"

will decide, given its autonomy, whether or not to take into account the comments received (if major comments are not integrated, this needs to be explained). The final evaluation report is expected **8 weeks** after the field phase

Planning of the evaluation

Action	Actor	Timing
Mailing of the formats for the self-assessment reports to the stakeholders	VLIR-UOS secretariat	At least 16 weeks before field mission
Process for hiring evaluation team (framework contract or tendering)	VLIR-UOS	At least 11 weeks before field mission
Attributing evaluation assignment to evaluation team	VLIR-UOS	At least 8 weeks before field mission
Contracting	VLIR-UOS and international consultant	At least 6 weeks before field mission
Receiving the self-assessment reports to VLIR-UOS-secretariat	VLIR-UOS (sends to evaluation team)	At least 2 weeks before the mission
Final timing of evaluation missions to be planned with appointed experts	VLIR-UOS secretariat	Between contract and field mission
Inception phase (desk study, interviews Belgium, preparing field mission, etc.)	• Evaluation team • the Northern stakeholders • VLIR-UOS • DGD	Between contract and field mission
Inception report	• The evaluation team • VLIR-UOS validates	Two week before the field mission
Evaluation missions	▪ evaluation team ▪ the Southern stakeholders	Indicatively at least 1 week between January 28 (start on 29) and February 8, 2018
Submission of the draft evaluation reports to the Flemish and local coordinators	Evaluation team, via VLIR-UOS secretariat	ASAP
Debriefing + comments on the draft evaluation report	▪ the Northern stakeholders, coordinated by the Flemish coordinator ▪ the Southern stakeholders, coordinated by the local coordinator ▪ VLIR-UOS	ASAP
Final evaluation report	• The evaluation team • VLIR-UOS validates	Within 8 weeks after the end of the mission

7. Deliverables, quality assurance & use of the evaluation

Deliverables

1. The evaluation team will deliver an inception report before the start of the field mission (at the end of the inception phase). The evaluation team provides VLIR-UOS with a concise, simple inception report including:
    - the approach towards the evaluation
    - methods for data collection + detailed mission planning
    - Activities already undertaken
    - evaluation grid or questionnaires developed
    - any change requests to the ToR

    The inception report is expected before the evaluation mission in the partner country and is a prerequisite for the payment of a first instalment. The inception report needs to be concise and to the point (its content being part of the preparation of any evaluation). VLIR-UOS validates the inception report.
2. The evaluation team needs to deliver an evaluation report and a PowerPoint presentation including the most important elements of the evaluation report. The evaluation team needs to use the template provided by VLIR-UOS for the evaluation report (cfr. “Planning of the evaluation”).

Quality Assurance

VLIR-UOS will do everything to assure an independent, transparent, and impartial evaluation process. If there would be any element that could jeopardize the quality (or integrity) of the evaluation or the principles of independence, transparency or impartiality, the evaluation team must bring this to the attention of the reference group during the evaluation process in order to be able to pro-actively remedy it and limit its impact on the evaluation’s quality. Critical elements that negatively affect the quality of the evaluation need to be mentioned in the report. If an issue cannot be resolved through the reference group, the problem will be escalated to the Bureau UOS level. It is also the responsibility of the evaluation team to assure quality during all steps of the evaluation.

Use of the evaluation

The use of the evaluation is already described in the chapter on the purposes of the evaluation. For steering purposes, VLIR-UOS will formulate a management response to the evaluation (for recommendations directed at the VLIR-UOS secretariat) and will invite the intervention(s) under evaluation to formulate a management response to the evaluation (for recommendations directed to the intervention(s)). Implementation of the management responses will be followed-up. For accountability and learning purposes, VLIR-UOS will publish the Evaluation Report on its website as soon an possible after receiving the report (after some lay-out work, if needed). As soon as the management responses become available, VLIR-UOS will also digitally add it to the online version of the evaluation report. The report will also be printed for further dissemination. VLIR-UOS will actively disseminate the evaluation reports to its stakeholders: to other VLIR-UOS projects/programmes active in the country/ies, to other development actors active in the same country/ies or field(s) and to DGD. VLIR-UOS will also disseminate information about the evaluation through other channels (e.g. storytelling on website).

Annex 2: Evaluation framework

EQ 1 – To what extent is the project relevant?

Rationale:

From the study of documents and interviews it has already become clear that the Network programme fits within the national policy "Buen Vivir" and within the national educational reform processes for higher education. During the evaluation it will be examined to what extent the alignment with these national policies was conducive for obtaining the results.

In Ecuador the discussion on the potential for the VLIR Network programme (identification stage) coincided with the development of the VLIR-country strategy and first conceptual ideas where worked out by the institutional university cooperation partners of VLIR-UOS ESPOL and UCuenca. Based on the conclusions of the country strategy, it was decided to invite ESPOL to propose a NETWORK programme proposal and start a joint formulation process with interested Flemish academic partners. In both the country strategy and the VLIR Network priority is given to biodiversity (in the country strategy referred to as 'biodiversity and natural resources'). Evolving towards a country approach, it will be relevant to analyse the linkages between several VLIR-UOS initiatives in Ecuador, in particular their relation with the Network and potential for mutual strengthening.

Within the context of higher education reform processes in Ecuador it is clear that there was a need for the development of full-time research based master programmes. The VLIR Network is assumed to build up good practices having potential for up-scaling at national level.

Under this evaluation criteria it is also important to assess the level of coherence in the intervention logic, which can have an influence on effective and efficient project implementation. This was not explicitly asked in the ToR but added by ACE Europe.

Under judgement criterium 1.1., one of the guiding questions refers to transversal themes of the Belgian development cooperation. Since these themes were not explicitly part of the programme at the time of the formulation, ACE Europe will not score this topic but it might come up as an element in the analysis

Judgment criteria	**Guiding questions/indicators**
1.1. The objectives of the project are consistent with the needs of the Universities involved, the country/local needs, country educational policies, partner and donor's policies	• The project is addressing clear demand and specific needs/problems expressed by the 4 Universities involved • The project is aligned to the educational reform and policies for higher education in Ecuador. • The level of investment in knowledge and technology transfer, relevant for external stakeholders (private and/or public), which will contribute to local and regional development (incl. selection of relevant research topics). • The project is aligned to the objectives identified in the VLIR-UOS country strategy for Ecuador. • The project topics and approaches are sufficiently relevant for other development actors (and could lead to interesting spin-offs) • The project is including transversal themes of the Belgian development cooperation: gender, environment and D4D[15]
Judgement scales	
Excellent	The project is an appropriate answer to needs and issues identified by the universities involved, and is in line with the educational reform processes in

[15] Digitalisation for Development

	Ecuador. The project delivers adequate responses to development needs in the region/locally.
Sufficient/Good	The project is an appropriate answer to some of the key needs and issues identified by the universities involved and is in line with the educational reform processes in Ecuador. The project delivers to a certain extent responses to the development needs in the region/locally.
Insufficient/low	The project responds to some of the key needs and issues identified by the universities involved but the content/strategies are is not fully what was expected by the universities involved. The project is in line with the educational reform processes in Ecuador. The projects is not relevant for the development needs in the region/locally.
(very) Poor	The project does not provide an appropriate answer to the key needs and issues identified by the universities involved and does not deliver adequate responses to the development needs in the region/locally.

1.2. The project has looked for synergy[16] with other projects aimed at capacity development of the universities involved in the Network	• The project has looked for synergy with other VLIR-UOS interventions in the country or at regional level • Several VLIR-UOS initiatives are mutually strengthening • The project has looked for synergy with projects supported by other (Belgian) donors/actors • The project has looked for synergy with endogenous capacity development interventions (initiated, executed and managed by the universities involved)
Analysis on this criterion will be added on this chapter, without scoring and visualisation as a separate judgement criterion	
1.3. The intervention logic of the project is coherent	• Coherence between expected results and specific objective • Choice of activities is relevant for obtaining the results and objectives • Intervention can be flexibly adapted to changes in the context when needed in order to remain relevant
Excellent	The choice of all activities is appropriate to realise the expected results and to contribute to the specific objective. The project is sensitive to changes in the context.
Sufficient/Good	The majority of activities is appropriate to realise the expected results and to contribute to the specific objective. The project is sensitive to changes in the context.
Insufficient/low	The majority of activities is appropriate to realise the expected results; but the expected results are not appropriate to contribute to the specific objective. The project is monitoring changes in the context but does not responded adequately to these changes.
(very) Poor	The choice of activities is not appropriate to realise the expected results and to contribute to the specific objective. The projects has is not sensitive to changes in the context.

Sources of verification:

- Self-assessment reports
- Programme and project documents (programme proposal and annual plans)
- Policy documents of national government, universities, VLIR-UOS

[16] We will use the word 'synergy' but this will cover synergy, complementarity and/or alignment

- Interviews with programme coordinators, project leaders and focal points
- Interviews with current and former rectors and vice-rectors; and deans

EQ 2. To what extent the project's specific objectives have been achieved (effectiveness)?	
Rationale Two specific objectives are formulated: (1) A research based joint master's programme in biodiscovery developed, improved understanding and use of biodiversity through a research based master programme delivering professionals; (2) A research based joint master's programme in water resources management (WRM) developed; enhanced local capacities for sustainable use of water resources management by delivering highly trained local professionals on WRM. For the mid-term evaluation focus will be put on the academic objective. The self-assessment reports show that the two masters have been developed and that several cohorts of students have started the masters. Attention will be paid to the level of involvement of all 4 universities in the master, the appreciation of the students, the extent research based education is being applied, the number and quality of research projects being implemented and alike. The cohort of students already graduated will give indications of the extent to which acquired knowledge and skills are being applied in practice (and contributing to the development objectives). As this is a mid-term evaluation and focus was on the development of the masters, not much effects at development level might be visible already. Attention will be paid to the extent the masters are interacting with external stakeholders in order to make the courses relevant for the practice (delivering professionals with relevant knowledge and skills and developing knowledge products that are relevant for practitioners). To that end, several external stakeholders will also be interviewed, including CES and Senescyt, that are the key stakeholders in the accreditation process of the masters and the delivery of scholarships. The ToR added an additional evaluation criteria, namely "scientific quality". ACE Europe has included this criteria under the evaluation question on effectiveness. Following consultation with VLIR-UOS, for the network programmes focus needs to be put on quality of education and the link between education and research.	
Judgment criteria	**Guiding questions/indicators**
2.1. The specific academic objectives have been realised	• The indicators as developed for the specific academic objective at project level (logframe) have been achieved[17] • Nature and quality of the collaboration between the four universities in developing and managing the master programmes (incl. co-promotors for master theses, joint research and joint publication) • Developed knowledge is accessible and being used by a variety of external stakeholders • Non-expected results • Factors contributing to the level of achievements
Judgement scales	
Excellent	The specific objectives have been fully achieved. Masters have been developed and students are graduated or expected to be graduated. Linkages between research and education have been established and research based education is applied by all universities involved.

[17] Indicators such as: Two joint master programs in biodiscovery and water resources management established by May 2014; At least 50% of the graduates of each master contribute to organizations involved in management, development, or policy making in biodiversity and water resources.

Sufficient/Good	The specific objectives have been partially achieved, with a majority of the indicators being realised. The universities are running a joint master programme. Linkages between research and education are being looked for. Research based education is being applied by the majority of lecturers and professors involved.
Insufficient/low	The specific objectives have been partially achieved with a minority of the indicators being realised. A joint master programme has been developed but there are difficulties in integrating research findings in education. Research based education is only being applied by a limited number of lecturers and professors.
(very) Poor	The specific objectives have not been realised.

1.1. The project has groundbreaking nature and ambition (scientific quality)	• Clear quality standards for a scientific master are available (at national level and at each university) and respected. • The masters have been accredited or are in the process of accreditation • Knowledge gained on models for curriculum development for a scientific master. • Relevant research lines developed and being implemented and linked to educational courses • Growing number of professors and lecturers applying research based education. • Introduction of different and modern learning and teaching materials/tools, blended learning, etc. • The education provided is cutting edge demonstrated by a growing number of students, high rating of the quality of education by the students, integration of research findings in educational programmes, accreditation. • Number of students showing interest in a doctoral programme • Number of students participating in research and in publications
Excellent	The scientific master courses are developed according to (internationally) quality standards and are eligible for international accreditation. Educational practice has improved substantially and all lecturers and professors teaching in the joint master courses are able to apply modern learning and teaching tools and approaches.
Sufficient/Good	The scientific master courses are developed according to (internationally) quality standards but are not yet eligible for international accreditation. Educational practice has improved substantially and the majority of lecturers and professors teaching in the joint master courses are able to apply modern learning and teaching tools and approaches.
Insufficient/low	Scientific master courses do not answer sufficiently to national quality standards. Some improvements in educational practice.
(very) Poor	Scientific master courses do not answer at all to the national quality standards. No improvement in educational practice.

Sources of verification:

- Curricula review
- Textbooks, laboratory manuals, learning packages, teaching tools developed
- Research lines
- Accreditation reports
- Articles, conference abstracts, chapters in books, conference contributions, etc.
- Self-assessments reports and KRA indicators
- Interviews with lecturers and students

- Interviews with network coordinator, project leaders and focal points
- Interviews with external stakeholders

EQ 3. What is the level of efficiency in the projects ?	
Rationale Efficiency refers to the manner in which inputs are processed for the delivery of the expected outputs in a timely and cost-efficient manner. Efficiency therefor relates to the processes, to the activities executed for the production of the planned results in the pursuit of higher level objectives. The ToR refer to efficiency as "*a measure of how economically resources/input (funds, expertise, time, etc.) are converted to results*." The ToR do not request a quantifiable cost-effectiveness assessment but rather a qualitative appreciation of the relation between inputs and outputs. This also includes an analysis of the factors that have strengthened or hampered efficient programme implementation. As the VLIR-UOS also includes the realisation of the intermediate results under efficiency in the self-assessment reports ACE Europe has followed the same logic (see first judgment criteria). The level of efficiency is also influenced by the presence and application of the systems and procedures for programme management. This is captured in the third judgment criterion.	
Judgment criteria	**Guiding questions/indicators**
3.1. **Intermediate results have been delivered.**	• Level of realisation of intermediate results according to indicators formulated • Level of attainment of the KRA • Non-expected results • Factors contributing to the level of achievements
Judgement scales	
Excellent	The intermediate results have been fully achieved.
Sufficient/Good	The intermediate results have been partially achieved, with a majority of the indicators being realised.
Insufficient/low	The intermediate results have been partially achieved with a minority of the indicators being realised.
(very) Poor	The intermediate results have not been realised.
3.2. Relationship between means and results achieved and objectives (qualitative assessment)	• Share of advisory support missions, scholarships, investment costs and operational costs is reasonable in relation to the realisation of the intermediate results. • Relevant expertise could be mobilised among all universities involved in the Network programme (North and South) • Rate of over- and/or underspending and the quality of its justification • Choice of activities: cost-effectiveness is being pursued in programme design and management. • Network programme used as a leverage to attract other funding that contributes to the Network objectives.
Excellent	Resources and capacity requirements are clear in project design and well monitored. All costs made are justifiable taking into account the output delivered. Clear evidence of cost-considerations.
Sufficient/Good	Resources and capacity requirements are clear in project design and well monitored. The majority of costs are justifiable taking into account the output delivered. There are systems/procedures in place to support cost-considerations.
Insufficient/low	Resources and capacity requirements are only partially clear in project design, hampering good monitoring of the resources.

	Costs made are often not sufficiently justifiable taking into account the output delivered. Systems/procedures in place to enable cost-considerations are most often not respected or there are no systems/procedures in place.
(very) Poor	Resources and capacity requirements are not clear in project design, hampering good monitoring of the resources. The majority of the costs cannot be justified taking into account the output delivered. No evidence of cost-considerations.

3.3. **Project management is conducive for efficient and effective project implementation**	• Good working relation between the Network coordinating university (Network coordination at the hub university) and the focal points at each university and with the programme support unit (clear guidelines, transparency, timeliness, etc.) • Appropriate planning, monitoring and reporting system in place • M&E data are used to inform and review strategies • Guidelines for project management as described in the management manual have been respected and have contributed to efficient and effective project implementation • Factors hampering efficient management have been managed well • Good quality of communication within the partnership
Excellent	Management roles, tools, procedures and systems were clear to and respected by all stakeholders involved, and helpful for monitoring and managing the project. When needed appropriate measures were taken to improve project management.
Sufficient	Management roles, tools, procedures and systems were clear and respected by the majority of the stakeholders, and helpful for monitoring and managing the project. When needed appropriate measures were taken to improve project management.
Insufficient/low	Management roles, tools, procedures and systems were not clear and/or often not respected by all stakeholders and hampered smooth project management. Measure taken to improve project management were not appropriate.
(very) Poor	Management roles, tools, procedures and systems were not clear and/or not respected by all stakeholders. No initiative was taken to solve difficulties in project management.

Sources of verification:

- Self-assessment reports
- Interviews with PSU, Network coordinator, project leaders and focal points in Ecuador, project leader and network advisors in Belgium; and ICOS Gent
- Interviews project teams at each university
- Annual financial plans and reports, annual narrative plans and reports
- Management manual
- Sample of mission reports and minutes of the steering committee meetings

EQ 4. To what extent the project results will continue after the Network programme is completed?	
Rationale: During phase 1 of the network programme two master courses have been developed and are being implemented. Educational and research capacities of staff have been strengthened to improve the educational practice in these masters. The second phase will build upon these results and take measures for their consolidation. As this is a mid-term evaluation, specific attention will be paid to the conditions that need to be in place to guarantee sustainability of the results achieved in order to give input for the second phase. A distinction is made between institutional and financial sustainability. Focus here is at sustainability at project level (concerning each of the master programmes). Evidently factors facilitating or hampering sustainability at programme level (institutional level) will have an influence on the sustainability at project level (see further).	
Judgment criteria	**Guiding questions/indicators**
4.1. **Level of academic and institutional sustainability**	• Ownership of the master programmes developed: commitment by rectors and vice-rectors of universities involved, commitment of staff and deans involved • Elaborated marketing and promotion strategy • Policy on human resource development includes measures for staff retention and staff training • Strategy for staff training on research based education • The development of a doctoral course is taken into consideration • Conditions are in place to support scientific research: research friendly environment (research policy, research culture), equipped labs, research lines developed, preparation of students to become involved in research, etc. • Process for international accreditation taken into consideration or started • Identification and development of strategic partnerships with other universities (national level, internationally, Belgium), among other to become involved in joint research and foster students and staff mobility • Commitment of the Flemish counterparts (staff and student mobility, elaborating joint research projects) • Interest and enrolment of students
Judgement scales	
Excellent	Institutional sustainability is fully guaranteed
Sufficient/Good	Sustainability is explicitly addressed and explicit measures are being taken
Insufficient/low	Sustainability is not explicitly addressed, but some attention is given to ascertain ownership and to create conditions to create a research friendly environment and conditions
(very) Poor	Little or no efforts are done to secure sustainability
4.2. **Level of financial sustainability**	• Availability of funds for operations and maintenance of physical infrastructure • Availability of own funds for continuing project results • Enhanced efforts to attract external funding, like enhanced credibility, track record, involvement in networks or joint cooperation with a variety of stakeholders • Presence of measures to enhance financial sustainability • Opportunities to attract funding from private sector

Excellent	Financial sustainability is fully guaranteed
Sufficient/Good	Sustainability is explicitly addressed and recognisable explicit measures are being taken
Insufficient/low	Sustainability is not explicitly addressed, but some attention is given to attracting external funding
(very) Poor	Little or no efforts are done to secure sustainability

Sources of verification:

- Strategy documents related to external relations, collaboration and fundraising
- Self-assessment reports
- Follow-up plan or preparatory documents for the second phase
- Interviews with Network coordinator, project leaders and focal points, project teams and with external stakeholders
- Interviews with deans of faculties, rectors and vice-rectors, directors of departments international relations, directors human resource management, directors post graduate programmes, and alike

Five evaluation questions at programme level

EQ 1 – To what extent is the Network programme relevant?

Rationale:

The Network programme consists in the development of the two joint master programmes on biodiversity and water resources management, which are subject of the assessment at project level. Complementary, the assessment at programme level will focus on the nature and quality of the inter-university cooperation, which is at the core of the network programme, its effect at institutional level within each of the participating universities and the added value of a network project, building on results achieved within other VLIR projects (Team projects, South Initiatives and Institutional Cooperation Programmes). The assessment of the project related to programme management and the PSU unit will be integrated here, in the evaluation at programme level.

Judgment criteria	**Guiding questions/indicators**
1.1. The objectives of the Network programme respond to the needs of the universities involved, and are aligned to the country educational reform process.	• See evaluation of relevance at project level • The Network programme is helpful in strengthening the research and education practice in each of the universities involved, for e.g. in order to obtain or maintain the status of an "A" university (as far as possible). • Inter-university cooperation is relevant within the framework of educational reform processes and policies for higher education in Ecuador and/or is used as a good practice in advocacy work taken forward by the universities towards the different government institutions and policy makers involved in higher education policy. • Selection of research topics is based on a good analysis of the political and economic context. • Knowledge developed in the masters and related research is relevant for informing national

	policies, in particular with regards to natural resource management and the national MDGs action plans.
Judgement scales	
Excellent	The Network is an appropriate answer to needs and issues identified by the universities involved, and is in line with the educational reform processes in Ecuador. The Network delivers adequate responses to development needs in the region/locally.
Sufficient/Good	The project is an appropriate answer to some of the key needs and issues identified by the universities involved and is in line with the educational reform processes in Ecuador. The project delivers to a certain extent responses to the development needs in the region/locally.
Insufficient/low	The project responds to some of the key needs and issues identified by the universities involved but the content/strategies are not fully what was expected by the universities involved. The project is remotely in line with the educational reform processes in Ecuador. The projects is not relevant for the development needs in the region/locally.
(very) Poor	The project does not provide an appropriate answer to the key needs and issues identified by the universities involved and does not deliver adequate responses to the development needs in the region/locally.
1.4. The Network programme is a leverage for securing sustainable and impact of several VLIR-UOS projects in the universities involved.	• Evidence of alignment or synergy with other VLIR-UOS projects at the universities involved • Alignment between several VLIR-UOS projects contributes to cost-effectiveness • The Network programme creates opportunities for further collaboration with the Flemish partner universities.
Excellent	Implementing partners have pro-actively looked for synergy with a variety of other projects supported by VLIR and took action for alignment with these projects.
Sufficient/Good	Implementing partners have looked for synergy with other VLIR projects and looked for possible alignment/exchange of information with these projects and looked for possible alignment with these interventions.
Insufficient/low	Implementing partners are aware of other VLIR projects supporting capacity development but did not look for alignment, synergy or complementarity.
(very) Poor	Implementing partners did not exchange information on other VLIR projects supporting capacity development of their universities.
Sources of verification: - Strategy and policy documents of Universities involved and VLIR-UOS - Self-assessment reports - Interviews with project teams - Interviews with deans of faculties, rector and vice-rector, directors of departments international relations, directors human resource management, director post-graduate departments, network coordinator and focal points - Interviews with external stakeholders	

EQ 2. To what extent the programme objectives have been achieved (effectiveness)?	
Rationale The specific objectives at project level are similar to the specific objectives formulated at programme level. At programme level the assessment will focus on the effects of the development of joint masters at institutional level of each of the universities and the nature and quality of the inter-university cooperation.	
Judgment criteria	**Guiding questions/indicators**
2.1. The specific academic objectives have been realised (focus on the institutional level)	• New regulations, procedures, agreements and processes have been developed to execute legally and efficiently joint master programmes. • Expertise and experience of each of the universities are valorised (taking into account comparative advantages). • Presence of organisational structure and processes at each of the universities that promote high quality standards in teaching and research. • Functional coordination structure established to manage inter-university cooperation. • A culture of collaboration among local universities is being promoted. • Implication of universities in a Network contributes to mutual strengthening of the research and education practice at each of the universities. • Non-expected results • Factors contributing to the level of achievements
Judgement scales	
Excellent	The specific objectives have been fully achieved. A culture of collaboration is actively promoted by all the universities involved (and supported by rectors and vice-rectors) and conditions are in place at all universities involved to support inter-university collaboration.
Sufficient/Good	The specific objectives have been partially achieved, with a majority of the indicators being realised. There is a positive evolution towards more effective inter-university collaboration. Not in all participating universities the conditions are in place to support inter-university collaboration.
Insufficient/low	The specific objectives have been partially achieved with a minority of the indicators being realised. A culture of collaboration is not actively promoted by the universities involved.
(very) Poor	The specific objectives have not been realised.
2.2. The specific development objectives have been realised	• Graduated students (#7) have found a job that fits with their educational profile • External stakeholders are interested to contribute to the development of research based masters (advisory function, cases, etc.) • Evidence of knowledge uptake by external stakeholders • Non-expected results • Factors contributing to the level of achievements
Excellent	The specific objectives have been fully achieved. All indicators have been realised. External stakeholders are actively involved in the joint masters. External stakeholders have access to knowledge products and are making use of the developed knowledge

Sufficient/Good	The specific objectives have been partially achieved, with a majority of the indicators being realised. External stakeholders has access to knowledge products.
Insufficient/low	The specific objectives have been partially achieved with a minority of the indicators being realised. External stakeholders are only involved in a limited manner. Developed knowledge is not yet accessible for the society.
(very) Poor	The specific objectives have not been realised. There is no relevant knowledge developed yet to be used by society.

Sources of verification:

- Strategy and policy documents of universities involved
- Self-assessments reports and KRA indicators
- Interviews with staff and researchers involved
- Interviews with external stakeholders
- Interviews with deans of faculties, rector and vice-rector, directors of departments international relations, directors human resource management, director post-graduate departments, network coordinator and focal points; and PSU unit

EQ 3. What is the level of efficiency of the Network programme ?

Rationale

Efficiency will be above all assessed at project level. At programme level it is relevant to focus on the programme management and the extent to which this programme management was conducive for efficient and effective project implementation. This relates to project 3: programme support unit.

Judgment criteria	**Guiding questions/indicators**
3.3. **Programme management is conducive for efficient and effective project implementation**	• Different stakeholders involved in management have taken up their respective roles (PSU, programme management in Flanders and ESPOL and have engaged in an efficient way with the stakeholders at project level (such as project leaders, network advisers, team members/focal points at partner institutions) • Coordinators have shown leadership in the management of the programme: clear agenda, uptake of decisions, support to project leaders • Good working relation with the programme support unit (clear guidelines, transparency, timeliness, etc.) • Good cooperation between projects, within projects and between the programme and the universities • Appropriate result based planning, monitoring and reporting system in place • M&E data are used to inform and review strategies • The set-up and use of the financial management system enables the follow-up of expenditures, including adequate and transparent financial management • Factors hampering efficient management have been managed well • VLIR-UOS support and funding is flexible • Good quality of communication within the partnership • Quality of external communication (incl. web page development)

Excellent	Management roles, tools, procedures and systems were clear to and respected by all stakeholders involved, and helpful for monitoring and managing the project. When needed appropriate measures were taken to improve project management.

sufficient	Management roles, tools, procedures and systems were clear to and respected by the majority of the stakeholders, and helpful for monitoring and managing the project. When needed appropriate measures were taken to improve project management in most cases.
Insufficient/low	Management roles, tools, procedures and systems were not clear and/or often not respected by stakeholders, which hampered smooth project management.
(very) Poor	Management roles, tools, procedures and systems were not clear and/or not respected by all stakeholders. There were difficulties in project management and no intervention was taken to solve these problems.

Sources of verification:

- Self-assessment reports
- Interviews with PSU, Network coordinators and project leaders in North and South, focal points in Ecuador and ICOS Gent
- Interviews project teams
- Annual financial plans and reports
- Annual narrative plans and reports
- Management manual
- Sample of reports: mission reports, minutes of the steering committee meetings

EQ 4. To what extent the Network results will continue after the programme is completed (sustainability)?

Rationale:

Also at programme level a distinction is made between institutional and financial sustainability. At programme level focus will be put on the assessment of the sustainability of the inter-university cooperation at institutional level. As described for the assessment at project level, there is a strong link between sustainability at institutional level at sustainability at project level.

Judgment criteria	**Guiding questions/indicators**
4.1. **Level of academic and institutional sustainability**	• See assessment at project level • Evidence of reflections on how to institutionalise joint master development and joint research, involving several local universities. • Intensification and/or formalisation of inter-university consultations, evidence of inter-university cooperation initiatives (north-South, south-south) • Measures to prevent brain drain, installing incentives (pull factors against push factors) • Visibility of the Network • Level of alignment between the master courses developed and master courses at Flemish university that can foster continuing collaboration. • Collaboration and exchange outside of VLIR-UOS programme (within Ecuador and internationally) • Other factors enhancing institutional sustainability

Judgement scales

Excellent	Institutional sustainability is fully guaranteed
Sufficient/Good	Institutional sustainability is explicitly addressed and explicit measures are being taken
Insufficient/low	Institutional sustainability is not explicitly addressed, but some attention is given to create conditions enabling a research friendly environment
(very) Poor	No or little efforts are done to secure sustainability

4.2. **Level of financial sustainability**	• Evolution of co-funding of Network activities by the partner universities – ability to (co-) finance events, workshops, congresses, mobility grants, investments, infrastructure. • Incorporation of costs (own and external funding) into budget of the universities involved for continuing the two joint masters • Enhanced ability to attract external funding, like enhanced credibility, presence of track record, ability to produce joint proposals, involvement in networks or joint cooperation with a variety of stakeholders • Presence of measures to enhance financial sustainability • Opportunities to attract funding from private sector
Excellent	Financial sustainability is fully guaranteed
Sufficient/Good	Financial sustainability is explicitly addressed and explicit measures are being taken
Insufficient/low	Financial sustainability is not explicitly addressed, but some attention is given to attract external funding
(very) Poor	Little or no efforts are made to secure sustainability

Sources of verification:

- Strategy documents related to external relations, collaboration and fundraising
- Self-assessment reports
- Interviews with staff and researchers involved
- Interviews with external stakeholders
- Interviews with deans of faculties, rector and vice-rector, directors of departments international relations, directors human resource management, director post-graduate departments, network coordinator and focal points; and PSU unit

EQ 5. What are the indications of impact (long-term effects) of the project?

Rationale

The ToR refer to impact as "*potential positive and negative, primary and secondary long-term effects produced by the project, directly or indirectly, intended or unintended*". The evaluation budget however does not allow an extensive impact assessment, in particularly not related to impact at development level. More-over, a mid-term evaluation usually does not measure impact.

It has been agreed with VLIR-UOS that the evaluators will assess whether there are 'indications' of impact at academic level and within the society, under the programme philosophy "Sharing minds, changing lives".

Judgment criteria	**Guiding questions/indicators**
5.1. **Indications of impact at academic level**	• Models for curriculum development for masters in science are developed and shared with relevant departments/faculties within each of the universities. • Commitment of universities involved to expand research based education among different faculties of the university. • More joint research is being conducted involving local universities. • Universities becoming involved in other inter-university networks. • The network is used as a good practice to be shared with other universities in Ecuador and with policy makers (in order to create a conducive environment for inter-university cooperation)

	• Universities involved demonstrate willingness to reflect on the development of other research based full time masters in science programmes
Judgement scales	
Excellent	The Network has a multiplier effect: new and/or good practices are multiplied within the universities involved and other universities.
Sufficient/Good	The Network has a multiplier effect: new and/or good practices are multiplied within some other departments or faculties of the universities involved.
Insufficient/low	The Network results only triggered interest of other departments/faculties/universities: they are interested to adopt certain approaches but no real action was taken yet.
(very) Poor	The project had no multiplier effect at all.
5.2. Indications of impact on local, regional or national development processes	• The extent to which the inter-university collaboration has led to joint development activities at local, regional or national level • Up-scaling of new knowledge/applications/services by external stakeholders such as government, NGOs, communities • Contribution of new knowledge/applications/services to improved performance of external stakeholders and/or to the realisation of development objectives at local, regional or national level • Provision of consultancy services to public and private sector actors (and as such amount of money earned on the market)
Excellent	There is evidence of policy development at national, regional or local level based on project results and/or external stakeholders have improved their performance applying new knowledge, application or services provided by the project, in a sustainable manner.
Sufficient/Good	There is evidence of contribution of the project team members to policy development at national, regional of local level and/or external stakeholders have adapted their approaches based on the knowledge resulting from the project.
Insufficient/low	The project team is not called by the government for policy advise and/or external stakeholders have only made use of services, outreach activities, new knowledge to a limited extent and not in a sustainable way.
(very) Poor	The project did not contribute to local, regional or national development objectives yet
Sources of verification: - Interviews with partners (educational institutes) in national and international networks (if relevant) - Self-assessment reports - Interviews with government officials involved in educational reform processes - Interviews with staff and researchers involved - Interviews with external stakeholders - Interviews with deans of faculties, rector and vice-rector, directors of departments international relations, director post-graduate departments, network coordinator and focal points	

Annex 3: Mission programme

Date	time	Activities	Place
Monday, 29/01	9:30-11:30	Interview former and current programme coordinator	ESPOL
	11:30-13:30	Interview rector, vice-rector and deans of faculties involved in the project	
	15:00-17:00	Interview project leader and staff involved in the project on biosciences Visit to virtual classroom	
Tuesday, 30/01	9:30-11:00	Interview programme manager and current programme coordinator	
	11:00-11:45	Interview director and staff involved at ESPOL-Tech	
	13:30-15:30	Interview project leader and staff involved in the project on WRM	
	15:30-16:30	Focus group discussion former and current students of MSc biosciences	
	16:30-19:30	Travel to Cuenca	
Wednesday, 31/01	9:00-10:00	Interview with focal points biosciences and WRM	UCuenca
	10:00-11:00	Interview with rector	
	11:00-12:30	Interview with staff involved in the project on biosciences, incl. director of postgraduate studies and visit to laboratories	
	14:00-15:00	Interview with staff involved in the project on WRM	
	15:00-16:00	- Focus group discussion former and current students of MSc biosciences - Focus group discussion current students of MSc in WRM	
	16:00- 17:00	- Interview with representative from ETAPA - Interview with representative from Elecaustro	
	20:00	Flight to Quito	
Thursday, 1/02	7:00-9:30	Interview with rector and vice-rectors and dean of faculty involved	UPN
	9:30-11:00	Interview with focal points biosciences and WRM	
	11:00-12:30	Interview with staff involved in the project on biosciences and WRM	
	14:30-15:30	Focus group discussion with external stakeholders	
	15:30 -16:30	Visit to laboratories	
	17:00	Travel to Quito	
Friday, 2/02	9:30-10:30	Interview with focal points biosciences and WRM	EPN
	10:30-11:30	Interview with rector and vice-rectors, deans of faculties involved	
	12:00-13:00	Interview at Senescyt	

		Interview at CES	
	14:3015:30	Interview with staff involved in project on biosciences	
	15:30-16:30	Interview with staff involved in project on WRM	
	16:30-17:30	Focus group discussion former and current students of MSc biosciences Focus group discussion current students of MSc in WRM	
	17:30-18:00	Visit to laboratories	
Saturday 3/02	First analyses and preparation sensemaking workshop		Quito
Sunday 4/02	Reporting + travel to Guayaquil		
Monday 5/02	9:30-10:30	Interview external stakeholder, INIAP director	ESPOL
	10:30-11:30	Interview with student participating in MSc on WRM	
	11:30-12:30	Interview with former and current programme coordinator	
	14:30-15:30	Interview external stakeholder: Interagua	
Tuesday 6/02	10:30-12:30	Restitution workshop with programme coordinator, programme manager and focal points at the four universities	ESPOL
	17:00	Return to Belgium	

Annex 4: List of people consulted

People consulted in Belgium

Peter Delanoy	Programme coordinator at VLIR-UOS
Peter Goethals	UGent, Programme Coordinator VLIR-Network and project leader Msc RRHH
Wim Vandenberghe	UAntwerp, Project leader Msc biodiversity
Martin Valcke	UGent, Network advisor
Christine Vanderheyde	HoGent, Network advisor
Guido Wyseure	KULeuven, Network advisor
Ziv Shkedy	UHasselt, network advisor
Veronica Minaya	VUB

People consulted in Ecuador

ESPOL

Paul Herrera	Vice Rector (former Network coordinator)
Carlos Monsalve	Decano de investigación
Carla Ricaurte	Decano postgrado
Julia Nieto	Sub-decana Facultad Sciencias de la Vida
Marcos Mendoza	Decano Facultad Sciencias naturales y matematicas
Juan Manuel Cevallos	Network coordinator and project leader Biodiversity
Sharon Guamán	Programme manager
Carlos Ivan Rivera	Gerente General ESPOL-TECH
Sonia Urbina	Economista Financiera ESPOL-TECH
Joyce Correa	Economista Comptable
Emillon Barcos	Docente-Investigador Biosciencias
Luis Galarza	Docente-Investigador Biosciencias
Maria Jimenez F.	Docente-Investigador Biosciencias
Patricia Manzano	Docente-Investigador Biosciencias
José Flores C.	Docente-Investigador Biosciencias
Julio Bonilla	Docente-Investigador Biosciencias
Olga Gonzalez	Docente-Director de laboratorios química (Recursos Hidricos)
Indira Nolivos Alvarez	Docente-FIMCBOR (Recursos Hidricos)

Mercy J. Borbor	Docente-Investigadora coordinadora de investigación (Recursos Hidricos)
Mijail Arias Hidalgo	Docente-Investigador FICT (Recursos Hidricos)
Luis Domingez	Docente-Investigador FCNM; focal point Water Resources Management at ESPOL
Miguel Quilambaqui	Docente-Investigadora FIMC (Recursos Hidricos)
Ana Délida Barragán Lucas	Estudiante Biodescubrimiento
Maria Fernanda Quijano Aviles	Estudiante Biodescubrimiento
Andrea Freire Guaranda	Estudiante Biodescubrimiento
José García Onofre	Estudiante Biodescubrimiento
Magdalena Aray Andrade	Estudiante Biodescubrimiento
Mariuxi Mirabá Guerreo	Estudiante Biodescubrimiento
Christian Sanga	Estudiante RRHH
Juan Manuel Domingez	INIAP – director ejecutivo
Celeste Viteri	INTERAGUA - Human resources director
Juan Carlos Bernal	INTERAGUA - Gerente de Compras y Contratos Sub-Gerente de AA.PP
Maria Helen Camacho Rivadeneira	PhD student, studying RBL

Cuenca university

Pablo Vanegas	Rector
Esteban Pachecho	Director General de Postgrado
Fabian Leon	Focal point Biodiversity at U Cuenca
Felipe Cisneros	Focal point Water Resources Management
Joana Ortiz	Coordinadora académica, docente-investigadora Biodescubrimiento
Eduardo Chica	Docente-investigadora Biodescubrimiento
Guillermina Pauta	Docente-investigador Facultad Ingeneria (recursos hidricos)
Diego Mora	Coordinador MsC en Rescursos Hidricos
Andrés Martínez	Docente-investigador Facultad Ingeneria (recursos hidricos)
Ruben Jerves	Docente-investigador PROMAS
Jessesiu Romeo Asanza	Estudiante biodescubrimiento C1
Sandra Fojarob Carmona	Estudiante biodescubrimiento C1
Carmen Maribel Ortega	Estudiante biodescubrimiento C1
Cristina Ochoa Aviles	Estudiante biodescubrimiento C2

Maria José Molina Cando	Estudiante biodescubrimiento C2
Karla Espinoza Castro	Estudiante biodescubrimiento C2
Janneth Cardenas Cordero	Estudiante biodescubrimiento C2
Rodrigo Tenesaca Sigua	Estudiante biodescubrimiento C2
Xavier Maza Mogrovejo	Estudiante RRHH
Edison Fernando Amay I.	Estudiante RRHH
Oscar Patricio Morales M.	Estudiante RRHH
Josue Larriva	ETAPA- Jefe del departemento de control de operaciones
Marta Aguilar	Elec-Austro Coordinadora ambiental y social

UTN

Marcelo Cevallos	Rector
Teresa Sanchez	Vice Rectora Academica
Miguel Naranjo	Vice Rector administrativo
Hernán Cadena	Sub-decano Facultad de ingeniería en Ciencias Agropecuarias y Ambientales
Bolivar Batallas	Decano Facultad de ingeniería en Ciencias Agropecuarias y Ambientales
Lucía Yépez	Directora de Posgrado
Elizabeth Valverde	Programme coordinator VLIR Network at UTN, Focal Point Water Resources Management, Docente Recursos Naturales y Energias renovables
Tania Oña	Focal Point Biodiscovery
José Ali Moncada	Coordinadora de investigación del instituto de Postrado
Maria Cristina Echeverria	Coordinadora de la carrera de biotechnologia; doce,te de microbiologia
Jesus Aranquren	Director del grupo de investigación agrobiodiversidad, soberania, seguridad alimentaria; Docente Recursos Naturales y Energias renovables
Verónica Ríos	Docente Recursos Naturales y Energias renovables
Oscar Rosales	Responsable del laboratorio de geomatica, Docente de los asignaturas de GIS y Remote Sensing
María Elena Ochoa	Municipio de Ibarra
Cristian Vega	Consultora KANICULTURA
Elizabeth Astudillo	
Marcelo Ponce	Municipio de Cotacachi
Fausto Cifuentes	Organización Social
Vanesa Obando	Ministerio del Ambiente
Cristian Chuquín	Empresa Privada KANAY

EPN

Jaime Calderón Segovia	Rector
	Vice Rector Docencia
	Vice Rector Investigación
	Decano Facultad Ingeneria Civil
Jenny Rurales	Coordinator VLIR-Network at EPN
Edwin Vera	Focal point biodiversity
Carla Manciati	Focal point water resources management
Ximena Ponce	Senescyt
Lucia Gallardo	Senescyt
Enrique Santos	CES
Francisco	Jefe del Departemento ciencias ambientales y biotechnologia, docente Msc biodescubrimiento
Sylvia Valencia Chamorro	Docente-investigador Msc biodescubrimiento
Neyda	Sub-decano de Facultad ciencias ambientales y biotechnologia, coordinadora academico,
Petra	Docente Departemento ciencias ambientales y biotechnologia, docente Msc biodescubrimiento
Gabriela Samaniega	Estudiante biodescubrimiento C 2
Roque Rivas	Estudiante biodescubrimiento C 2
Queenny Lopez	Estudiante biodescubrimiento C 2
Cristina Cifuentes	Estudiante biodescubrimiento C 1
José Villacis	Estudiante biodescubrimiento C 1
Francisco Queroz	Jefe del Departemento
Silvia Valencia	¨Profesora Principal
Neyda Espin	Sub-decana FIQA
Pedro Maldonado	Profesor FIQA
Xavier Zapata Rios	Profesor FICA
Khaled Hamad	Profesor FICA
Marcos Villacis	Profesor DICA
Nathalia Valencia	Profesor DICA
Benito Mendoza	Profesor UNACH

Annex 5: List of documents consulted

- Annual plans for project (biodiscovery, water resources management and PSU) 2013, 2014, 2015, 2016, 2017, 2018
- Annual reports “Improvement of the Ecuadorian Acaddemic Capacity on Biodiscovery and water management” yer 1, year 2, year 3 and year 4
- Management Manual 2012
- Network Partner Programme Programme proposal for phase I of Network Cooperation, April 2012
- Programme Management Manual 2016
- Self-Assessment reports:
    - Master in biosciences
    - Master in water resources management
    - Programme level – North partners
    - Programme level – South partners
    - Partner university level:
        - UTN
        - EPN
        - U Cuenca
- VLIR (December 2011) Ecuador Strategy Document
- Websites of the universities involved (consulted various times in the period January-February 2018)
    - www.epn.edu.ec
    - www.espol.edu.ec
    - www.ucuenca.edu.ec
    - www.utn.edu.ec

ABOUT VLIR-UOS

VLIR-UOS supports partnerships between universities and university colleges in Flanders and the South that seek innovative responses to global and local challenges.

We fund cooperation projects between professors, researchers and teachers. In addition, we award scholarships to students and professionals in Flanders and the South. Lastly, we contribute to strengthening higher education in the South and internationalising higher education in Flanders.

VLIR-UOS is part of the Flemish Interuniversity Council and receives funding from the Belgian Development Cooperation.

More information: www.vliruos.be

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Management response to mid-term evaluation

IMPROVEMENT OF THE ECUADORIAN ACADEMIC CAPACITY ON BIODISCOVERY AND WATER RE-SOURCES MANAGEMENT: PHASE 2 - 2018

Programme level

General appreciation

The mid-term evaluation is carefully read and studied by all the network partners in the programme, it is an useful and important document, especially with 14 concrete recommendations to the NETWORK programme in Phase 2, which is used for PP-II proposal development to reach the target objectives of the programme. The evaluation report mentions numerous positive evolutions within the programme. On the other hands, it also shows the limited points and challenges of the NETWORK programme which need to be solved and overcome in the second phase.

Follow-up on recommendations

Recommendation 1:	**Strengthening the application of RBL (research-based learning)**	
Management Response (Agree, partially agree, disagree)**:**	Agree	
If recommendation is rejected or partially accepted, report reasons:		
Actions Planned /Actions taken + timeframe (action finalised)		**Implementation stage** (not started, underway, completed
Develop plan for continuous training on RBL and virtual classroom by year 1 of phase 2		Underway (training sessions on RBL and virtual classrooms carried out on 4 consecutive years of phase 1)
Implement monitoring tools to follow-up RBL and collect data on its application by year 2 of phase 2		Underway (This was initiated during phase 1 by Helen Camancho)
Recommendation 2:	**Lobby for a favourable environment for (joint) research-based master programmes**	

Management Response (Agree, partially agree, disagree)**:**	Agree
If recommendation is rejected or partially accepted, report reasons:	

Actions Planned /Actions taken + timeframe (action finalised)	**Implementation stage** (not started, underway, completed
Lobby CES in different topics including the development of a regulatory framework that is in favour of RBL, implementation of itineraries, and connections with undergraduate programs. This will be done during the 4 years of the phase 2	Underway (Lobbying CES is done several times each year)
Lobby CES in the inclusion of distance learning for MSc students from other provinces. This will be done during the 4 years of the phase 2	Not started

Recommendation 3:	**Invest in up-scaling of good practices**
Management Response (Agree, partially agree, disagree)**:**	Agree
If recommendation is rejected or partially accepted, report reasons:	

Actions Planned /Actions taken + timeframe (action finalised)	**Implementation stage** (not started, underway, completed
Share Network practices with the Ecuadorian Universities (REDU Network) through workshops by year 3 of the 2nd phase.	Not started
Continue lobby activities within each of the universities from the VLIR Network to adapt systems and procedures in order to accommodate the organization of MSc and PhD programs by year 2 of the 2nd phase.	Underway (This was done during phase 1 and protocols were included in a MoU)
Develop an up-scaling strategy of the good practices (RBL in postgraduate programs) for each of the VLIR Network universities, taking into account institutional characteristics of each university by year 4 of the 2nd phase.	Not started
Incorporate the thematic network on WRM and Biodiscovery within REDU by year 2	Not started
Stablish links with other universities to promote the MSc and PhD programs. This will be done during the 4 years of the phase 2	Not started

Recommendation 4:	**Invest in establishing contacts with external stakeholders**
Management Response (Agree, partially agree, disagree)**:**	Agree
If recommendation is rejected or partially accepted, report reasons:	

Actions Planned /Actions taken + timeframe (action finalised)	**Implementation stage** (not started, underway, completed
Develop a strategy to strengthen collaboration with external actors by year 1 of the phase 2 (curriculum revisions, identification of research	Not started

topics, offering internship for thesis students, organization of Network activities that are relevant for them, etc.)	
Continuously develop non-scientific material to inform external stake-holders on research results	Underway (Various leaflets were developed during phase 1)
Organize workshops, conferences, and training programs for external stakeholders to make the Network and the master courses known.	Underway (various work-shops were done in phase 1)
Develop job markets for master students.	Underway (job markets al-ready exist in Network univer-sities)
Develop entrepreneurial, tech transfer, and managerial training courses for MSc and PhD students	Underway (courses offered in some of the Network universi-ties)

Project 1: Enhancing national capacities in biodiscovery

Follow-up on recommendations

Recommendation 1:	**Strengthening the application of RBL (research-based learning)**
Management Response (Agree, partially agree, disagree)**:**	Agree
If recommendation is rejected or partially accepted, report reasons:	

Actions Planned /Actions taken + timeframe (action finalised)	**Implementation stage** (not started, underway, completed
Execute continuous training on RBL and virtual classroom to project members by year 1 of phase 2	Underway (training sessions on RBL and virtual classrooms carried out on 4 consecutive years of phase 1)
Collect data on the RBL implementation to allow monitoring by year 2 of phase 2	Underway (This was initiated during phase 1 by Helen Camancho)

Recommendation 2:	**Lobby for a favourable environment for (joint) research-based master programmes**
Management Response (Agree, partially agree, disagree)**:**	Agree
If recommendation is rejected or partially accepted, report reasons:	

Actions Planned /Actions taken + timeframe (action finalised)	**Implementation stage** (not started, underway, completed
Collaborate on Lobby activities including data collection and analysis on related programs and their benefits	Underway (Lobbying CES is done several times each year)
Develop an innovative proposal for a 5-years combined undergrad-MSc program and submit to CES for approval	Not started

Recommendation 3:	**Invest in up-scaling of good practices**
Management Response (Agree, partially agree, disagree)**:**	Agree
If recommendation is rejected or partially accepted, report reasons:	

Actions Planned /Actions taken + timeframe (action finalised)	**Implementation stage** (not started, underway, completed
Collaborate in the Sharing of the Network practices with the Ecuadorian Universities (REDU Network) through workshops by year 3 of the 2nd phase.	Not started
Collaborate in lobby activities within each of the universities from the VLIR Network to adapt systems and procedures in order to accommodate the organization of MSc and PhD programs by year 2 of the 2nd phase.	Underway (This was done during phase 1 and protocols were included in a MoU)

Collaborate in the development an up-scaling strategy of the good practices (RBL in postgraduate programs) for each of the VLIR Network universities, taking into account institutional characteristics of each university by year 4 of the 2nd phase.	Not started
Incorporate the thematic network on Biodiscovery within REDU by year 2	Not started
Stablish links with other universities to promote the MSc and PhD programs. This will be done during the 4 years of the phase 2	Not started

Recommendation 4:	**Invest in establishing contacts with external stakeholders**
Management Response (Agree, partially agree, disagree)**:**	Agree
If recommendation is rejected or partially accepted, report reasons:	

Actions Planned /Actions taken + timeframe (action finalised)	**Implementation stage** (not started, underway, completed
Integrate professional trainings in the project activities. Develop outreach materials with research applications.	Underway (Various leaflets were developed during phase 1)
Invite stakeholders to the MSc courses as lecturers and attendants. Integrate visits to stakeholders and thesis development at stakeholders' facilities in the MSc curricula	Not started
Etablish a solid permanent contact with stakeholders through valorization managers at each partner HEI	Not started

Project 2: ENHANCING ECUADORIAN NATIONAL CAPACI-TIES ON WATER MANAGEMENT

Follow-up on recommendations

Recommendation 1:	**Strengthening the application of RBL**
Management Response (Agree, partially agree, disagree)**:**	Although several training workshops were offered to team members among the participant universities during the initial stage of Phase I, important changes on HEI´s staff occurred due to changes in the Higher Education Law. Project members agree with the need to strength the application of the RBL in the second phase among network participants.
If recommendation is rejected or partially accepted, report reasons:	NA

Actions Planned /Actions taken + timeframe (action finalised)	**Implementation stage** (not started, underway, completed
A yearly training workshop on RBL will be offered to all lecturers.	Underway
A virtual course on RBL and virtual classroom teaching will be developed for further adoption among participant institutions and other HEI´s	Not started

Follow-up tool-box will be developed and continuously used to monitor the proper implementation of the RBL methodology in program courses and trainings	Not started
Recommendation 2:	**Lobby for a favourable environment for (joint) research-based master programmes**
Management Response (Agree, partially agree, disagree)**:**	We agree with evaluator's comments. A lot a lobby has been done during phase I in favour of program aim. Nevertheless, additional changes are needed in HE legislation to fulfil the adoption and impacts of current trends in higher education (e.g. distance learning, dual-training).
If recommendation is rejected or partially accepted, report reasons:	NA
Actions Planned /Actions taken + timeframe (action finalised)	**Implementation stage** (not started, underway, completed
Opportunities to integrate distance learning in the master program will be explored during the last two years of the phase II.	Not started
An amendment will be prepared for CES during the second year to integrate advanced undergrad last-year courses (itineraries) as program curricula for the approved master program. Current changes in discussion for new HE legislation seems in favour of this initiative.	Not started
Strategies for a stronger knowledge transfer between master program and public and private water sector will be explored during the second year. Dual training and distance learning could open opportunities for advance training of their staff with a limited number of in-house classes.	Not started
Recommendation 3:	**Invest in up-scaling of good practices**
Management Response (Agree, partially agree, disagree)**:**	The VLIR-network experience has been considered as a model to be replicated among other institutions. We agree that a catalyser is needed for this kind of collaboration. We agree with the opportunities that up-scaling the learned lessons can have on institutions and complementary initiatives (ej. water professional networks, training programs on water related topics).
If recommendation is rejected or partially accepted, report reasons:	NA
Actions Planned /Actions taken + timeframe (action finalised)	**Implementation stage** (not started, underway, completed
	Not started
During phase II, the implementation/adoption of an international level association of water professionals will be explored. The presentation of the network as a candidate to organise an international event in the framework of IWA congress is considered as an opportunity for international linkage and the establishment of a country chapter.	Not started
The IWRM network at REDU gives the opportunity for a wider impact of the master program. Associated partners among these institutions will be identified for research and academic activities, broadening the region of project implementation.	Not started
Network marketing strategies will be discussed among participants and implemented along the four years of phase II. Lessons learned will be	Underway

presented at national networks platforms (REDU, CEDIA, SENESCYT, CES) to promote the development of similar initiatives in other fields.	

Recommendation 4:	**Invest in establishing contacts with external stakeholders**
Management Response (Agree, partially agree, disagree)**:**	We agree with evaluators that currently there are no real valorisation of our master graduates in the water labour sector. Actions will be implemented in phase II in order to increase the interaction on academic and scientific plans between the network and stakeholders.
If recommendation is rejected or partially accepted, report reasons:	NA

Actions Planned /Actions taken + timeframe (action finalised)	**Implementation stage** (not started, underway, completed
Current HE legislation demands the participation of stakeholders on an advisory committee for the master programs. Nevertheless, its participation is limited to annual meetings and limited interaction occurs in the daily basis. Increased collaboration with stakeholders will be promoted trough their participation on workshops for program curricula update, identification of thesis and internship training opportunities, as well as the yearly planning of training offers for water professionals and job opportunities. Partnership agreements with stakeholders are considered as one of the strategies that will be adopted for this aim.	Not started
During phase II training on the elaboration of policy advise papers (e.g. white papers) will be provided to lecturers and students. A better communication to the general public and decision makers will be vital for the adoption of current knowledge and proposed managements solutions in the water sector. Linkage with existing departments within participant institutions is seen as an strategy towards program impact in national policies (e.g. Public Policy Institute at ESPOL)	Not started
Program graduates have the opportunity to establish companies to offer products and services of high quality to the water sector. Nevertheless, no formal training is provided in program curricula towards relevant topics such as technology-transfer, intellectual property, business and administration. Complementary courses will be identified and implemented as complementary training for those students and lecturers interested to explore the establishment of new companies in the water sector.	Not started

Project 3: Enhancing national capacities in education and outreach innovation

Follow-up on recommendations

Recommendation 1:	**Strengthening the application of RBL (research-based learning)**
Management Response (Agree, partially agree, disagree)**:**	Agree

If recommendation is rejected or partially accepted, report reasons:	

Actions Planned /Actions taken + timeframe (action finalised)	**Implementation stage** (not started, underway, completed
Incorporate the development and implementation of a plan for continuous training on RBL and virtual classroom as a project IR by year 1 of phase 2	Underway. Project 3 is proposed and includes and IR for RBL training. Training sessions on RBL and virtual classrooms were carried out on 4 consecutive years of phase 1
Select the trainers and staff to be trained by year 1 of phase 2	Underway (This was initiated during phase 1)
Develop and implement follow up activities to assess in-class application of RBL	Underway (This was initiated during phase 1 by Helen Camacho)

Recommendation 2:	**Lobby for a favourable environment for (joint) research-based master programmes**
Management Response (Agree, partially agree, disagree)**:**	Agree
If recommendation is rejected or partially accepted, report reasons:	

Actions Planned /Actions taken + timeframe (action finalised)	**Implementation stage** (not started, underway, completed
Incorporate strategies and activities to Lobby CES, Senescyt and private stakeholders as an IR of this project. The activities will be implemented during the 4 years of the phase 2	Underway (Lobbying CES is done several times each year)
Lobby CES in the inclusion of distance learning for MSc students from other provinces. This will be done during the 4 years of the phase 2	Not started

Recommendation 3:	**Invest in up-scaling of good practices**
Management Response (Agree, partially agree, disagree)**:**	Agree
If recommendation is rejected or partially accepted, report reasons:	

Actions Planned /Actions taken + timeframe (action finalised)	**Implementation stage** (not started, underway, completed
Include strategy development of interactions with other universities as an IR of this project by year 1 of phase 2	Not started
Share Network practices with the Ecuadorian Universities (REDU Network) through workshops by year 3 of the 2nd phase.	Not started
Continue lobby activities within each of the universities from the VLIR Network to adapt systems and procedures in order to accommodate the organization of MSc and PhD programs by year 2 of the 2nd phase.	Underway (This was done during phase 1 and protocols were included in a MoU)

Develop an up-scaling strategy of the good practices (RBL in postgraduate programs) for each of the VLIR Network universities, taking into account institutional characteristics of each university by year 4 of the 2nd phase.	Not started
Recommendation 4:	**Invest in establishing contacts with external stakeholders**
Management Response (Agree, partially agree, disagree)**:**	Agree
If recommendation is rejected or partially accepted, report reasons:	
Actions Planned /Actions taken + timeframe (action finalised)	**Implementation stage** (not started, underway, completed
Include strategy development of interactions with other universities as an IR of this project by year 1 of phase 2.	Not started
Provide training on commercialization and tech transfer to staff within the programme	Not started
Develop a platform for continuous interactions with stakeholders	Not started
Develop entrepreneurial, tech transfer, and managerial training courses for MSc and PhD students	Underway (courses offered in some of the Network universities)