

**UBC's experience in building partnerships for development in Ecuador –  
1. From the top down: Establishing sustainable community-focused networks**

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## **Abstract**

UBC's 6 year *Sustainably Managing Environmental Health Risk in Ecuador* project was established in 2005 to build human resources and institutional capabilities for effectively reducing health impacts associated with environmental health risks in this low income country. To achieve impact, this ambitious transdisciplinary initiative involves professors and students from 10 centres and institutes at the University of British Columbia. Our 6 year CIDA (Canadian International Development Agency) - funded *University Partnerships in Cooperation and Development* project relies on the strengthening of links between universities and communities alongside a regional network involving Latin American centres of excellence in Cuba and Mexico to enhance sustainability of the capacities that will be built. Through an innovative national program involving 4 Ecuadorian universities, 30 masters students (interregional, intercultural with 5 indigenous community leaders) have completed an interactive problem-based transdisciplinary curriculum that was delivered in community settings, and are presently conducting participatory action research theses in over 15 communities, with subject areas ranging from pesticide poisoning, heavy metal contamination, dengue, water and sanitation, disaster preparedness and others. This paper focuses on the partnerships built to enable universities to link directly with communities and involve other stakeholders, such as government ministries to ensure sustainability and impact.

*This paper is a complement to a paper by Dr. Annalee Yassi et al.:  
UBC's experience in building partnerships for development in Ecuador –  
2. From the bottom up: Creating communities of learning and practice*

**UBC's experience in building partnerships for development in Ecuador –  
1. From the top down: Establishing sustainable community-focused networks**

**Introduction**

In July 2004, the University of British Columbia (UBC) signed a contribution agreement with the Canadian International Development Agency (CIDA) to work with a network of Ecuadorian universities to improve the environmental health conditions of vulnerable populations in this low income country. We have previously examined (Spiegel *et al.* 2007) how our “*Sustainably Managing Environmental Health Risks in Ecuador*” project has stimulated a range of profound transformations to the role of the university:

1. From didactic to problem-based interactive teaching
2. From passive to change agent learning
3. From individual disciplinary to group transdisciplinary frameworks
4. From technocratic to critical thinking
5. From uni-cultural to intercultural perspectives
6. From university isolation to facilitating engagement and impact
7. From community-based to community-driven knowledge transfer
8. From international “assistance” to “community of practice” networks

In this article, we focus on how the partnerships necessary to carry out this ambitious undertaking rely on institutional commitments “from the top down”, to create conditions that facilitate putting “participatory development” (Taylor and Angeles 2006) into practice. While explicitly exploring the distinct context that is presented, we attempt to draw broader lessons that can be taken from this experience. Recognizing that progress is not a simple linear process, we draw attention to critical areas where challenges remain, if such positive developments are to be sustained and generalized. This examination is a companion to an analysis of how change has been actively propelled by “re-engineering” learning processes and community interactions “from the bottom up” through an innovative curriculum and series of community interactions. (Yassi *et al.* 2007)

## Background

### Context

The origins of the *Sustainably Managing Environmental Health Risks in Ecuador* project can best be appreciated from the perspective of 4 distinct trends that emerged globally in the 1980s and 1990s:

- 1) Intensification of **disparities and negative consequences of development** that threatened sustainability and undermined the “promise” of globalization;
- 2) Recognition of the **complexity of factors in social and ecological systems** that contribute to human health outcomes;
- 3) Introspection into the **role of the university**, especially the ability to effectively address the challenges of unsustainable development and integration with its communities; and
- 4) Insights into the **limits of traditional forms of pedagogy** and the power of interactive learning.

Despite the strong faith of the “neo-liberal project” that economic growth in the late 20<sup>th</sup> century would set in motion a chain reaction of events that would result in generally improved health and welfare for the world’s peoples (Feachem 2001, Dollar and Kraay 2001, World Bank 1993), critics and proponents alike developed a common acknowledgement that there was a highly asymmetric distribution of benefits and costs, and that these disparities were ethically unacceptable (Cornia 2001, Woodward *et al.* 2001, Labonte and Schrecker 2007). Adoption of the Millennium Development Goals (MDGs) was a reflection of both concerns for disparity and faith in the capacity for successfully addressing this. While consensus is growing that few MDG targets will be reached by 2015 (Haines and Cassels 2004), the emergence of greater accountability and evidence on equity-oriented targets has itself raised the profile of such issues, even to invite observations that the framing of the targets may itself are too narrow (Amin 2006).

Alongside the unprecedented pace of global changes being experienced at the end of the 20<sup>th</sup> Century, growing attention was drawn to understanding associated interactions. The basic paradigms for understanding the health of human and ecological systems were particularly reassessed. However, these reexaminations still largely remained bound by the disciplinary foundations of the various explorations of complexity:

- focus on *ecological system* interactions emphasized principles of adaptive management and natural systems, with limited emphasis on human health (Holling 2001)
- focus on the relations between *development and environment* (WCED 1987) concentrated on threats to sustainability, but only scratched the surface of implications for human health;
- focus on determinants of *population health* (Evans and Stoddart 2003) concentrated on the limitations of overemphasizing treatment of illness and disease without attention to prevention, but stopped well short of considering interactions with environmental factors.

It was in this context that an integrative “ecosystem approach to human health” emerged as a vehicle for enabling a *transdisciplinary* discourse that also explicitly introduced focus on the *participation* of policy-makers and affected communities, as well as the central concerns of *equity* (Forget & Lebel 2001, Lebel 2003) alongside other models designed to explain these complexities (Figure 1).

Amid the economic expansion and growing complexities experienced in the late 20<sup>th</sup> Century, the role of the university in the “knowledge society” emerged as an important theme in and of itself. In particular, attention was drawn to consider whether and how the university could establish itself within this context as a dynamic and powerful catalyst for positive change. (Taylor and Angeles 2006)

Finally, critical examination of the traditional “knowledge-focused” teaching methods that were dominant in university settings raised seriously questioned their effectiveness. (Finucane *et al* 1998) By drawing attention to skills and attitudes in more holistic contexts, new interactive and problem-based approaches were introduced, with the suggestion that such orientations could bring greater impact. This itself prompted further reconsideration of how the university could best carry out its role within society.

### Origins

Directly in the context of the trends discussed above, the “*Sustainably Managing Environmental Health Risks in Ecuador*” project directors became explicitly involved in developing teaching materials to address these challenges in the 1990s. Over time, these efforts led to the broader partnership ultimately pursued in Ecuador.

In 1994, following the seminal 1992 “Earth Summit” (United Nations Conference on Environment and Development – UNCED 1992), in Rio de Janeiro, author AY, on sabbatical from the University of Manitoba, was commissioned by the World Health Organization to develop a new text and curriculum to provide a more holistic approach to teaching environmental health (Yassi *et al.* 1997, Yassi *et al.* 2001). In the process of developing these materials, a Cuban member of the project’s review committee suggested the creation of a partnership to assist a capacity-building effort that was to be undertaken in his country. This led to the establishment of the 5 year “*Building Interdisciplinary Capacity in Environmental Health Risk Assessment and Risk Management across Cuba*” project.

As would be the case in Ecuador, the emphasis in Cuba was placed on applying transdisciplinary interactive teaching methods, with the goal of the learner becoming an agent of change (Spiegel *et al.* 2006) better prepared to work with local communities. Key outcomes in this endeavour were strengthened Diploma and Master’s programs in Cuba’s well recognized National Institute of Hygiene and Epidemiology (INHEM) – alongside new programs being established in regional locales (Santa Clara in the centre; Santiago de Cuba in the east) to support greater decentralization in building further human resource capacity. While this undertaking was initiated when the project directors

were at the University of Manitoba, UBC joined as a full partner when the project directors transferred here just prior to the institutional partnership's official launch.

Under the terms of CIDA's University Partnerships in Cooperation and Development (UPCD) program (CIDA UPCD 2007), the Cuba project (as a "Tier 2" endeavour) was substantially less ambitious than the eventual "Tier 1" undertaking in Ecuador. As per the specifications of the UPCD program (Figure 2), the distinction rests on the expectation of Tier 1 projects that "impacts" (e.g. community benefits as measured as improved health or reduced health risk / better living conditions) be achieved – i.e. over and above strengthened institutional capacity being established through the creation of appropriate outputs (e.g. curriculum, graduated students, trained faculty).

As part of our UPCD Tier 2 Cuba project, a Basic Environmental Health Workshop was conducted in Havana in June, 2001 with the participation of other Latin American and Caribbean colleagues. The involvement of four Ecuadorians at this event set in motion our eventual collaboration when they explicitly called for developing a comparable initiative to address the serious environmental health risks prevalent in their homeland. The prospect of extending the proven efficacy of what was underway in Cuba to a circumstance where there was greater institutional challenge and need seemed very appealing. Furthermore, as the strengthening of Cuba's role in the Latin American region had been an explicit sub-objective of our work together, the prospect of incorporating a South-South collaboration in Ecuador seemed to be an appealing way to enhance impact and sustainability.

In June 2002, UBC and Cuban members of our Canada-Cuba UPCD Tier 2 project traveled to Ecuador to explore the feasibility of establishing a project there. Meetings conducted with representatives from various Ecuadorian universities confirmed the strong interest in pursuing collaboration.

## **Creating a vision**

### *A unifying orientation*

Through a series of meetings funded by CIDA's UPCD program after our initial Letter of Intent had been approved, our emerging team prepared a comprehensive proposal and implementation plan, as described below. In retrospect, our focus on building a clearly articulated vision responding to the trends identified above proved to be of great value in linking diverse forces. The core themes for this vision were the following:

- i) Applying an **ecosystem approach to addressing determinants of human health;**
- ii) Strengthening core skills and build **university capacity;** and
- iii) Promoting **knowledge exchange and community empowerment.**

Building on this orientation, our project set out to strengthen human resources and institutional capabilities so that effective ways to reduce environmental health impacts in Ecuador could be sustainably undertaken in partnership with those in a position to act.

For specific university-based efforts such as the *Sustainably Managing Environmental Health Risks in Ecuador* project to emerge, it is quite typical for the impetus for this to emerge from the “middle” (i.e. engaged faculty / researchers involved in the application of knowledge in a particular context who explore the feasibility of initiatives). However, without the link to an institutional commitment “from the top”, success and sustainability of initiatives remains difficult if not impossible to achieve. And while there is an increasing impetus to forge good links from the universities with affected communities, e.g. from the “bottom” or “base” where conditions are more directly experienced, such connections with universities generally still remain weak at the present time. Accordingly, consolidating support “from the top down” is of critical strategic importance.

In many ways, the articulation of a feasible opportunity to pursue interdisciplinarity and strengthen direct engagement with communities and policy-makers to address fundamental and neglected social problems provided universities with an appealing “natural experiment” for addressing issues that Latin American universities were increasingly recognizing. (Tünnermann 1998; Tünnermann and de Souza 2003) For the Ecuadorian universities, the opportunity to collaborate with a prestigious high income country university was furthermore very attractive, especially given the impetus for them to demonstrably raise standards in order to thrive. For UBC, as is discussed further below, the opportunity to directly address global disparities was especially timely.

So, over and above the substantial benefits to be gained from implementing the project, undertaking the *Sustainably Managing Environmental Health Risks in Ecuador* initiative concurrently provided all the universities involved with a timely way for them to tackle fundamental institutional challenges. This perhaps better explains why the partnerships necessary for pursuing participatory development objectives have proven to be feasible.

#### Project outcomes and impacts

To fulfill the project vision of *strengthening capacity to design, conduct and evaluate effective interventions to improve the health of vulnerable populations threatened by environmental health risks*, emphasis on the application of knowledge to achieve impact in communities through participatory methods (i.e. participatory development) has been central, with academic training taking place at several distinct levels:

- Master level training to develop fundamental knowledge and skills;
- PhD training to ensure excellence in research leadership;
- A certificate program to ensure community outreach; and
- Practitioner workshops to ensure that those involved in targeted areas work effectively.

In the context of our specific capacity building focus, specific outcome targets were set for the different levels of capacity building (Figure 3), with each level oriented in its own way toward community-based research and intervention projects.

At the top of our “conceptual pyramid” was the training of 4 PhD students who would be groomed to play a leadership role in the university programs that were being established, especially by being capable of successfully attracting international research funds.

The next level comprises 60 Masters students, with the first cohort of 30 instructed by the international team working with Ecuadorian tutors, and the second cohort taught by the initial cohort alongside other members of the university-based teams involved in the “communities of practice” being created, with the collegial assistance of the international team.

The third level consists of 150 individuals receiving certificates (with a less intensive coverage of the Masters and no thesis requirement); and the fourth level encompasses 600 individuals receiving community certificates, reflective of their involvement (e.g. workshops) associated with the focused community-level activities/interventions being conducted.

In addition, targeted workshops involving practitioners in key designated areas where environmental health risks are being confronted (e.g. health impact assessment processes, impacts on indigenous communities, mining development and its environmental and social impacts) are to be conducted over the full course of the project, explicitly exploring the role of the university in these processes.

As a whole, these intended outcomes are designed to establish a strengthened capacity of Ecuadorian universities to train human resources in environmental health risk assessment and management in Ecuador; well-trained practitioners; tightened links between university personnel, community based practitioners, decision-makers and communities; and improved capacity of Ecuadorians to work in international teams.

The intended impacts of the project are measurably reduced disease and risk factors in 6-10 targeted communities (e.g. heavy metal contamination, pesticide poisoning, dengue, water and sanitation); improved ability to assess and manage environmental health risks in Ecuador; enhanced ability of Ecuador to participate in networks to address global health problems; and strong networks of interdisciplinary expertise across the Americas.

## **Building the core partnerships**

### *An international team*

To address a challenge as broad as “sustainably managing environmental health risks”, our project needed to draw on a wide range of expertise to establish networks able to sustain a community of practice capable of addressing these issues.

In the first instance, this called for building a strong multi-disciplinary team at the University of British Columbia, the home base for our collaboration. While only a minority of those who would be become involved with the project had previous experience with the “ecosystem approach to human health”, the challenges of transdisciplinarity, participation and equity that lie at the heart of this approach resonated

with all - and served as an appropriate central vision for the undertaking. Furthermore, the opportunity to refine proven interactive teaching methods in community-based settings with the explicit goal of achieving impact provided additional attraction, and our UBC team enthusiastically took shape – with a vision for being able to learn from this process and collegial interactions so that improved methods could then be applied further “at home”.

Once the UBC faculty team began to assemble to focus on the challenges involved in achieving community impact, attention was drawn to the need to extend to disciplines not previously included in the Cuba capacity-building project, but feasible given the breadth of UBC’s scope of involvement. Thus, areas such as disaster preparedness, community planning, indigenous health and agro-ecological systems were added and were incorporated as core modules in preparing curriculum.

Of critical importance in constructing the core team at UBC, however, was the fact that the university was then in the process of redefining its role in the context of its *Trek 2010* Strategic Plan that called for the development of greater strengths in transdisciplinarity and achieving community impact to better contribute to “global citizenship”, to “*prepare students to become exceptional global citizens, promote the values of a civil and sustainable society, and conduct outstanding research to serve the people of British Columbia, Canada, and the world*”. “Internationalization” was explicitly identified as a core area, along with “people”, “research”, “learning” and “community”. This orientation, though not yet developed as to detailed implementation, provided a very comfortable fit with the *Sustainably Managing Environmental Health Risks in Ecuador* project’s ambitious design.

Recognizing the cross-cultural challenges that would be encountered, as well as the advantages of reinforcing regional networks rather than solely creating new *ad hoc* bilateral relationships, from the very beginning we sought to build on existing partnerships involving established Latin American centres of expertise. In addition to our Cuban partners at INHEM, with whom we had in fact initiated the exploration of the Ecuador undertaking, we connected with other colleagues at the Instituto Nacional de Salud Publica (INSP) in Mexico, with whom various members of the UBC team had previously collaborated, and who themselves had a strong history and commitment to training programs in our subject area. This North-South / South-South orientation was vividly reflected in the logo selected for the project, which draws attention to the international character of the collaboration. (Figure 4) Bilateral agreements with UBC were then established with both INHEM and INSP to formalize the terms for the relationships in support of the capacity-building efforts in Ecuador.

Our project thus was able to establish a multi-faceted consortium (Table 1) of university faculty from a variety of centres and institutes at the University of British Columbia and centres of excellence in environmental health in the Latin America and Caribbean to join forces with the network to be built in Ecuador for the purpose of creating core capacities in the domain of managing environmental health risk. (UBC Centre for International Health 2006)

### National capacity

Unlike our experience in Cuba, the Ecuadorian universities who wished to collaborate in this project did not have pre-existing Public Health programs upon which to build. However, they strongly felt that the approach that had been applied in Cuba could be extremely valuable in addressing circumstances of great need in Ecuador and the communities in their immediate proximity – and senior administration and faculty were especially excited by the prospect of developing closer ties to their communities. They were similarly intrigued by the way that they felt that the project seemed to create a novel way to stimulate transdisciplinary collaboration.

At the same time there was a clear recognition that much greater challenges would be faced – and that even greater transformations would be required to achieve sustainable solutions to address environmental health concerns in Ecuador. To achieve this, the partnerships that formed to propel the project in Ecuador were fuelled i) by a vision of directly engaging learners and transforming the partner universities by implementing a participatory development approach to address important health threats in Ecuador; and ii) by the identification of concerns and challenges in the ecological, social and health systems of Ecuador that were being identified by Ecuadorian and International research teams (see for example Breilh 2005, Betancourt 2005, Cole *et al.* 2002, Sebastian 2002, Waters 2006, Webb *et al.* 2004, Yanggen *et al.* 2004).

From the very beginning of our contact, the vision that was being considered in Ecuador was the establishment of a multi-university collaboration that could support a program of more national scope. A series of meetings and planning sessions thus led to the creation of an Ecuadorian consortium with a vision of building a program of national scope that could cut across different regions and apply an intercultural perspective. This was deemed to be of critical value in a country as diverse as Ecuador, with its sharp distinctions among coastal, mountain and Amazonian regions (Figure 5) and its large indigenous population - estimated between 25-40% of Ecuador's 13 million inhabitants (PAHO 1993; Rosengren 2002).

From our very first meetings in 2002 to explore the desirability and feasibility of developing a project in Ecuador, Dr. Francisco Huerta, the Vice-President (International) of the Consejo Nacional de Educación Superior (CONESUP) was actively involved – and emphasized the critical importance of providing a substantive alternative to the explosion of Masters programs in Ecuador that had occurred in the late 1990s, where supervision had been characterized to be of unacceptably poor quality applying traditional didactic methods with limited student supervision. As all postgraduate programs in Ecuador must be approved by CONESUP, these insights from a leader within this institution were invaluable in gaining a good understanding of both institutional and development needs and challenges.

Two predominant concerns thus stimulated the development of the project in Ecuador:

- 1) A profound need in the domain of environment and health (with poor health indicators and a pattern of low public spending in these areas) that was identified by the Ecuadorian partners; and
- 2) A specific concern that there was a great need to raise the quality of how post-graduate education was being conducted in Ecuador.

To achieve impact and strengthen capacities where they were needed, we purposely sought to support partnerships in the less well endowed public (versus private) universities, based on an expressed commitment to the transformative vision being created. The unfamiliar and unconventional territory of this multi-stakeholder orientation (bridging different countries, universities, public institutions and local communities) caused some members of our original planning team - who were more oriented to traditional program delivery - to withdraw. Fortunately, however, through interactions that began from the earliest contacts in developing the project, our partnership was consolidated with three universities (Figure 5):

- the University of Machala (an expanding coastal community in a region marked by intense resource use and ecosystem disruption),
- the University of Bolivar (in the Andean Sierra or highlands, in one of Ecuador's poorest provinces, with a largely indigenous population); and
- the University of Cuenca (also in the highlands, a large well-established university with a highly respected medical school)

Coordinators at each university were appointed to lead this effort and ensure national collaboration.

Given the challenge of building a program of national scope, and the need to strengthen local capacities for doing this, in collaboration with our Ecuadorian university partners, UBC engaged the involvement of a well established NGO (CEAS) in the capital city of Quito committed to the values central to our vision (community-based action research applying an eco-health approach). The Director of CEAS (JB) was one of the few trained (MD PhD) Ecuadorians with extensive experience in our area of focus (through IDRC funded projects, Breilh 2007), as well a long-standing leadership role in Public Health in Latin America (Breilh 2003); so it was an excellent fit to appoint him as Academic Director of the Masters Program. Drawing on analysis of driving forces and global pressures in Ecuador, CEAS research had identified a range of structural changes to the socio-economic environment that are producing distinct ecological pressures and new exposures (e.g. pesticides, mining contaminants) in each of the regions associated with the university partners, namely the provinces of El Oro (U de Machala), Azuay (U de Cuenca) and Bolivar (U de Bolivar in Guaranda).

The existing networks and collaborations of CEAS also facilitated the assembly of a talented and committed team of tutors with a range of relevant expertise to assist the ambitious effort we would then undertake – and ensure consistent supervision and support of students while introducing innovative learning methods. The success of the project quickly led to consolidating further partnerships, including the involvement of an important regional post-graduate university - Universidad Andina Simon Bolivar (UASB)

– not least due to the fact that our key partner at CEAS, was then appointed Dean of the UASB Health Sciences department.

## **Consolidating the partnership**

### Community engagement

Our project's cornerstone "Master's of Public Health with a focus on Ecosystems" (*Maestria en salud publica con enfoque de ecosistema*) was formally initiated in 2005 when CONESUP officially accredited it as a national partnership of three universities in collaboration with an international team – an unprecedented initiative. The rich learning experience and challenges that this has produced for the first cohort's 30 students and their respective universities are discussed in detail by Yassi *et al.* (2007).

While some community interaction was carried out during the training modules, more intensive interactions have occurred in the context of the master's students' thesis work (Figure 6) which deal with a range of pressing issues ranging from pesticide poisoning to water and sanitation (Table 2). Community members are being awarded community certificates for their involvement in workshops and related activities (Figure 7) as part of their involvement in this effort. Our intention is to further intensify channels of communication and collaboration, so that issues of concern will be identified and "the agenda" will increasingly be set by the communities themselves, transforming the relationship from "community-based" to "community-driven". In this context, future master's theses, and other university activities will take these evolving interactions as a point of departure.

With half of the Master's students from the first cohort being professors at the partner Ecuadorian universities, a strong institutional base of future instructors has been established. As the first cycle of the Masters program now being concluded, each university is embracing this experience to highlight how it is undertaking greater integration with their local communities. The December 2007 *Congreso Internacional de Entrenamiento para el Desarrollo Local* (International Congress on Training for Local Development) being organized at the University of Machala with a Spanish university (Universidad de Huelva España) will feature posters of the 10 masters students and a full explanation of our program as an exemplary approach to meeting the challenges to be discussed. Similarly, other plans are underway at the other university partners to build on the rich experiences being undertaken.

As the Master's program proceeds into its second cycle, the plan is to build on the foundations being established through the first wave of student projects. In this way, potential settings for future community-based projects can more systematically be considered by new cohorts of students, with greater potential for integrating this with further university involvement.

The practitioner workshops being conducted as part of the *Sustainably Managing Environmental Health Risk in Ecuador* project will be initiated in February 2008 in the context of a new Ecuadorian constitution that is being prepared. Following Ecuador's

overwhelming 2007 referendum approval (by over 83%) of establishing a constituent assembly to undertake this, our project will conduct “stakeholder workshops” to directly engage policy-makers, communities, and others directly involved to explore how health can best be integrated in this process, to increase the potential for creating conditions more supportive of health. This is an especially timely and challenging opportunity for considering challenges of sustainability, and we are further pursuing ways to enrich this with involvement of UBC faculty and students alongside the other international partners to contribute greater perspective to the exercise. Subsequent workshops will address more specific issues that are identified as the basis for effective community – university interactions with practitioners.

### Community of practice

Although formal undertakings were signed by all three Ecuadorian universities when our international project was initiated and a separate Memorandum of Understanding signed with CONESUP (and UBC), practical difficulties in operationalizing university commitment have persisted.

To stimulate the deeper involvement of the project within the life of each Ecuadorian university, and in conformity with university rules of having “thesis directors” directly affiliated with their institutions; steps were explicitly taken to strengthen links between these thesis directors and the international faculty involved in the student’s training. As a result, we sponsored involvement of thesis directors in a March 2006 workshop held in Havana to draw lessons from the Cuban UPCD program and held a previously unscheduled workshop with 15 thesis directors in conjunction with the second student ‘thesis seminar’ in April 2007. This is enhancing the capacity of the partner universities to build the critical mass needed to sustain the project in the upcoming second cycle of the masters program.

As might be expected, space and logistic difficulties have been experienced, particularly for getting computer facilities established and maintained at each site. To provide a firmer basis for consolidating such efforts, and facilitate the flow of funds directly and exclusively to project-related activities (a chronic challenge), a mechanism called the CTT (Centro de Transferencia de Tecnología – Technology Transfer Centre) was recently developed by Ecuadorian legislation, and is now being implemented (with some delays) as a pilot initiative in the Ecuadorian partner universities. In fact, the feasibility of establishing technology-enhanced knowledge translation capacities, building on experiences and strength at UBC, and part of our original design, will now be pursued in this context.

In Ecuador, rectors (equivalent to Canadian university presidents) are elected for five year terms, often amid instability and competing expectations; and with these transitions, incoming rectors have initiated their tenure with less familiarity with the program. Thus, issues with continuity and developing an institutional memory have been greater than that originally anticipated – but emphasis has been made to maintain communication. To

ensure good compatibility with each university's priorities, rectors have begun to attend National Committee meetings, and this has proven to be of vital importance.

As the project reached a critical moment of addressing ways to achieve sustainability, a round of comprehensive meetings held individually with each rector confirmed their commitments to maintaining the national and international networks being established, linking this to the strengths and potentials of their institution. A particularly exciting option in this regard involves moving beyond the project's original conception of providing doctoral training for 4 students (in Canada, Cuba and/or Mexico) to inaugurate a doctoral program at our newest partner university (UASB) that is well-established in post-graduate education; and has already initiated doctoral level programs in collaboration with U.S. universities. As CONESUP is preparing to issue criteria for introducing PhD programs in Ecuador, our program is slated to be the first such undertaking to receive official accreditation!

The opportunity for supporting the establishment of the PhD program provides a very exciting prospect strongly in keeping with our project's goal of strengthening institutional capacity in Ecuador. It will introduce a model of reinforcing university training within a Low Income Country in the context of an international network to reinforce high standards, rather than sending students abroad. This design will furthermore allow PhD students to maintain their local commitments and not weaken their own institutions by being drawn away, as periods of residency and course commitments will complement the normal academic year when many of the PhD students may have teaching responsibilities! Such difficulty has in fact been vividly encountered by our project. While we are successfully conducting PhD training for one Ecuadorian professor at UBC, a second who was scheduled to go to our Mexican partner for this training was forced to cancel due to the need to remain in Ecuador to undertake pressing commitments. Such conflicting pressures, and the relatively low language of English language skills among candidates who could conceivably fill the leadership role sought for the PhD candidates, suggest that a model more attuned to reinforcing local capacity will be preferable.

Within the framework of this strengthened partnership, a new Memorandum of Understanding linking the institutional partners is being drafted. This will not only reinforce the roles within the context of the "*Sustainably Managing Environmental Health Risks in Ecuador*" terms of reference, but will open a space for broader institutional partnerships and create a platform for pursuing research and learning opportunities for a wider range of disciplines in the respective institutions, but with a strong orientation toward participatory development themes.

## **Extending the partnership**

### Stakeholders

A companion paper (Yassi *et al.* 2007) highlights the need for strong institutional commitments to facilitate the undertaking of successful community projects, including partnership agreements with involved organizations, such as those employing students or involved in community projects. To further ensure that the issues being addressed in our

university initiatives connect well to the societal and community challenges being faced, and to promote opportunities for graduates and trainees to apply their skills, a standing advisory committee is in the process of being established for the project.

Our work has been actively assisted by officials such as the Canadian ambassador to Ecuador, and the Ecuadorian Honorary Consul in Vancouver, who are especially well positioned to foster international collaborations. As a result of such involvement, we are now exploring the feasibility of linking Canadian mining companies with our University partners so that our themes can be strengthened around the establishment of greater core capabilities in domains such as mining engineering and geology. This is especially significant given recent controversies over contentious development projects deemed to be environmentally unsustainable – and points to the potential of proactive university partnerships to promote healthier development trajectories and international relations.

### Accountability

As universities more systematically take on the challenges of “participatory development” and “global citizenship”, it is inevitable that tensions will be encountered with regard to how it conducts its core processes. (Roman 2003) Institutional recognition and rewards for faculty and the building of infrastructure support for international worked focused on “participatory development” have lagged and remain a struggle supported by the commitment to the goals of the project. For example, ‘overhead’ charges by the university on the funds available to hire new personnel further diminished capacity available to take on the new challenges, such as maintaining adequate internal communication and building capacities to work in new intercultural and linguistic settings. In this context, it has been a struggle to maintain the requisite institutional commitment by UBC, highlighting the importance of serious introspective consideration of the challenges of supporting “participatory development”.

Recognizing the significance of the work being undertaken, it is imperative that we are reflective and candid in how this is being conducted. In our project, we have highlighted the learning process itself as an important research theme, and the post doctoral fellow who played a lead role in organizing the master’s program teaching curriculum has received a national fellowship to further pursue this work. This reflection should extend to a larger examination of how the university is able to take on the challenges of putting “participatory development” into practice.

### **Conclusions: Sustaining impact through participatory development**

At the time of preparing this contribution, our project very much remains an evolving “work in progress”, which is part of the challenge, and part of the excitement. The strong allegiance to the project’s vision and commitment to transformations by all of those who have been involved in the project has been likened to the expression of “*amor a la camiseta*” – love of the jersey (for one’s hometown soccer team) that can mask competing interests that threaten sustainability. Such commitment must thus be critically considered if there is indeed to be an institutionalization of the values being established.

Sustainability of the project is indeed far from certain – with regard to both what is hoped to be consolidated at each university as well as the ultimate impacts being sought at the community level. Delivery of the first iteration of the Master’s program has been much more labor intensive and time consuming than initially contemplated. Even with university support in Ecuador strongly being confirmed by all the rectors involved, it will be challenging for the current Maestria students to be will be able to deliver the same quality of program, even with the support of additional local faculty - at least initially.

One way in which we are attempting to facilitate this transition is through the development of a comprehensive “teacher’s” guide. This guide provides a summary of all teaching and guidance materials to provide the second cohort’s Ecuadorian university-based instructors with materials to support the delivery of the program, as well as set a context for continued collaboration with members of the “international instructor” team. Workshops on the introduction and use of the guide have been carried out as part of its development process. Furthermore, by building support among policymakers for recognizing and supporting the application of the skills that are being developed in the master’s program, and by thoroughly documenting evidence of positive impacts, we hope to reinforce sustainability, and structure workshops on this theme in the second phase of the project.

This project is still at an early stage, so while preliminary, self-administered “process” evaluation has provided a range of constructive, positive and critical reflections, we readily acknowledge that the project warrants external review as well as sufficient time to assess true impact and its value in applying the principles of participatory development that we set out to achieve.

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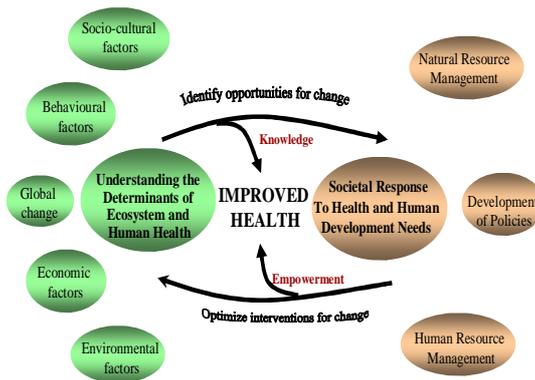
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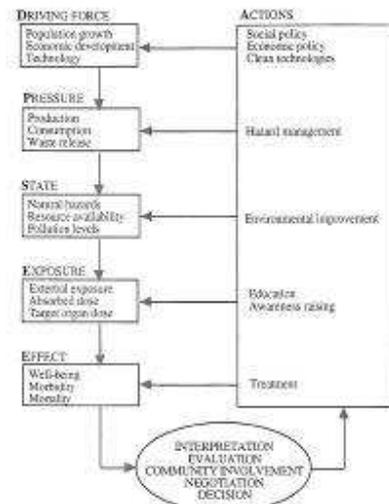
**Figure 1: Conceptual Frameworks informing an Ecosystem Approach to Human Health**

**Figure 1A: Ecosystem Approach to Human Health (Lebel et al 2001)**



Source: Forget and Lebel, 2001

**Figure 1B: The DPSEEA Framework.**  
From Yassi et al 1999, “Applying an Ecosystem Approach to the Determinants of Health in Centro Habana”, adapted from WHO, 1996



Source: WHO, Information for Decision-making in Environment and Health, 1996.

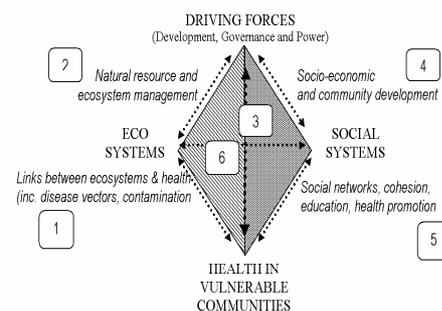
**Figure 1C: A Critical Epidemiology framework for Health Profiles - identifying interacting domains of influence on determinants of health.** Adapted from Breiilh, 2003.

**GENERAL**  
Structural Processes of Society in General – including  
- Socio-economic drivers,  
- Power Relationships  
→ **Destructive Factors**  
→ **Protective Factors**

**PARTICULAR**  
Social Groups: Classes, Gender, Ethnicities (across generations), including  
- Modes of Life  
- Mediating and/or generative processes  
- Physiological Conditions and Genetic Types  
→ **Destructive Factors**  
→ **Protective Factors**

**SINGULAR**  
Individuals, Families and their ‘Life-styles’, including  
- Daily Practices  
- Patterns of Exposure and Protection  
→ **Destructive Factors**  
→ **Protective Factors**

**Figure 1D: The Prism of Health and Sustainability: Integrating multiple perspective on the determinants of health**

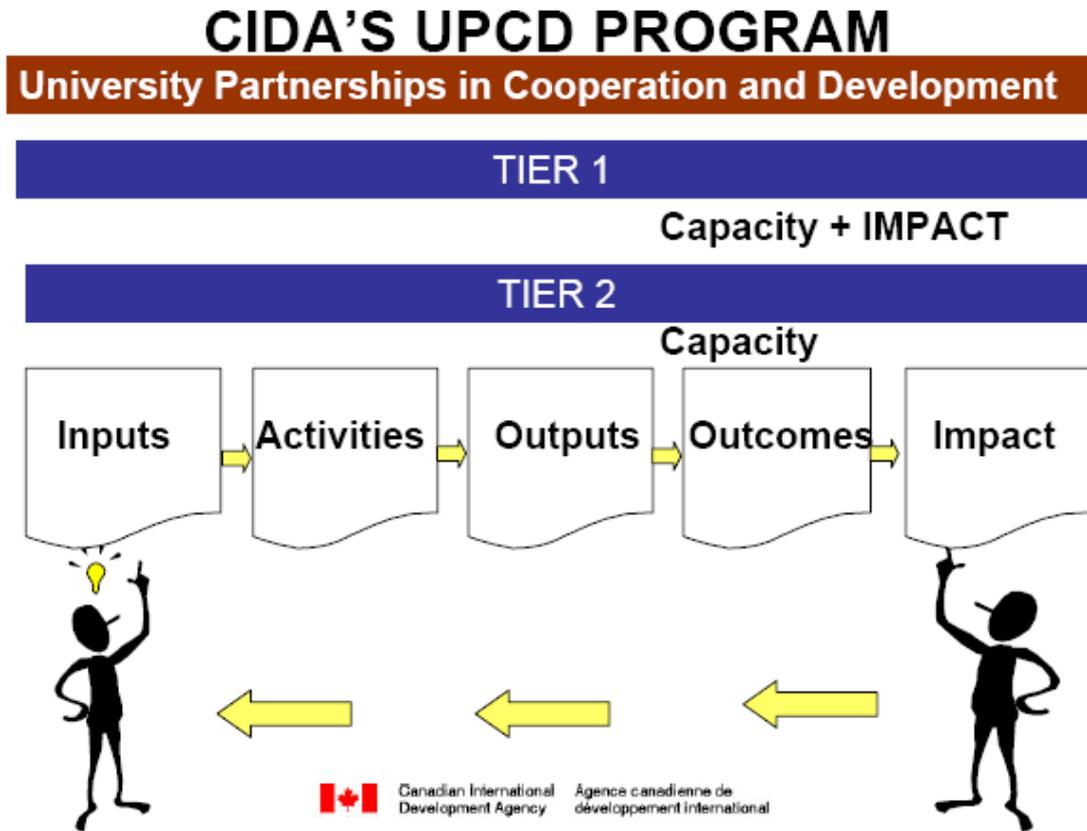


1. Ecosystem change/environmental hazards and health impact (traditional environmental health)
2. Natural resource and ecosystem management (including land and water use)
3. Health services and Infrastructure (includes water and sanitation services)
4. Community & social development (includes socioeconomic determinants of health)
5. Social networks, cohesion, health promotion, education (includes social capital)
6. Socioecological systems as a foundation of both health and sustainability (policies that link ecosystem and community systems can enhance both environmental and socio-economic determinants of health)

*Transdisciplinary methods that draw on both ecological, social and health sciences create opportunity for innovation and integration*

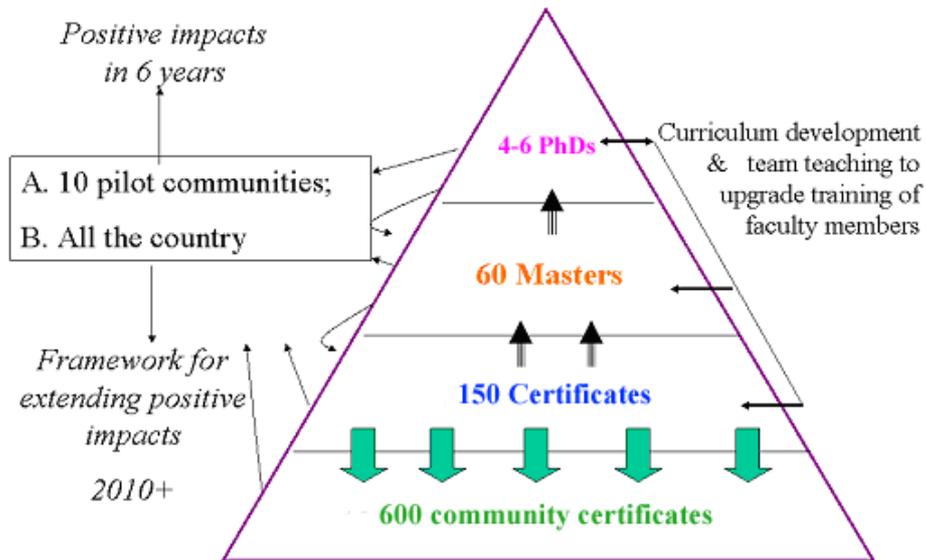
Adapted from the ‘Prism Framework of Health and Sustainability’. Parkes et al, 2003, Fig

Figure 2: University Partnerships in Cooperation and Development (UPCD) program



**Figure 3: Capacity Building and Impact Summary**

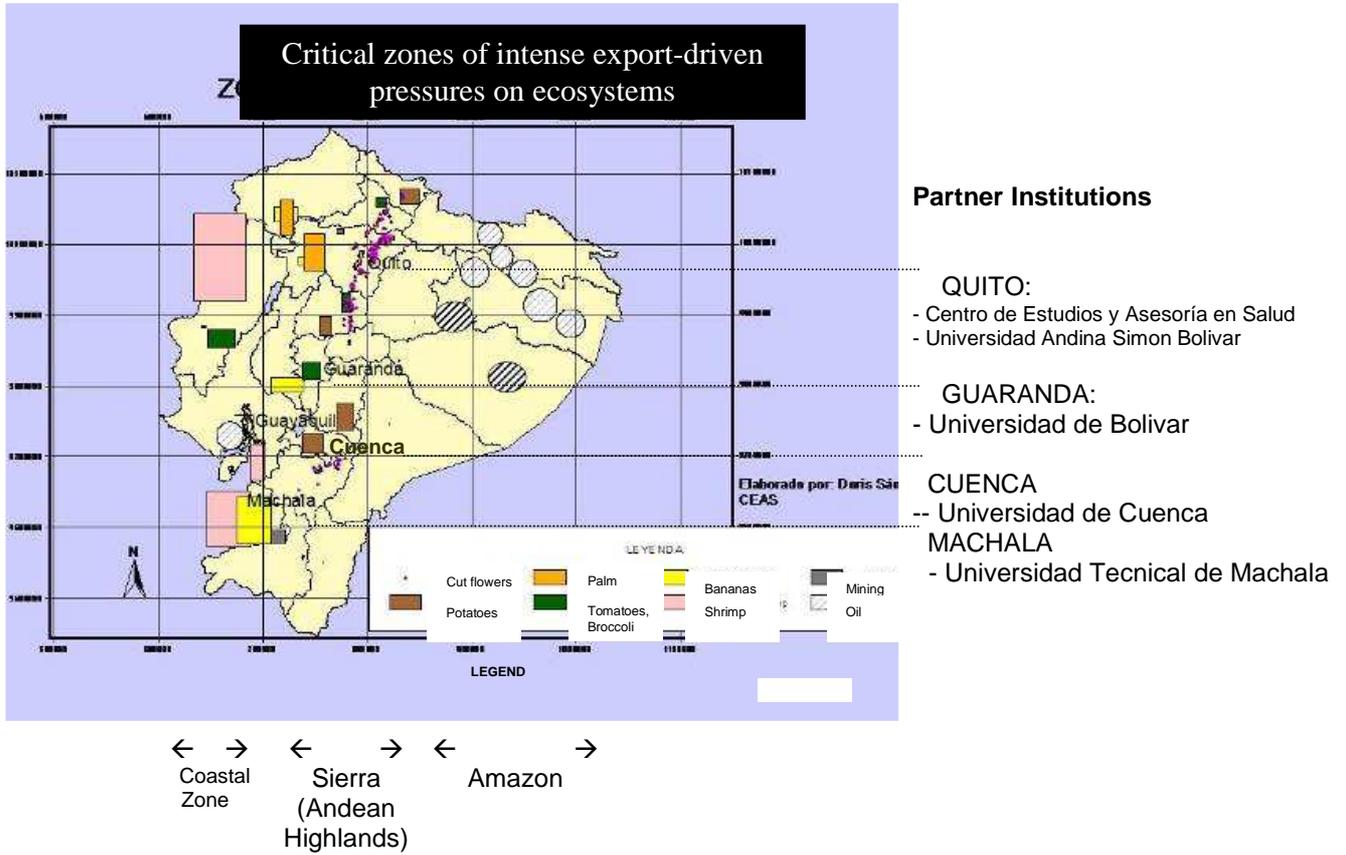
## Capacity-building and Impact Summary



**Figure 4: Project Logo for ‘Sustainability Managing Environmental Health Risks in Ecuador**



**Figure 5: Map of Ecuador – including analysis of critical zones for community-based projects and collaboration**



**Figure 6:** Community based Master's Program thesis work

**Figure 6a:** Discussing Occupational Health in Salinas



**Figure 6b:** Discussing Water issues in Costa Rica



**Figure 6c:** Inspecting slaughter house in Bolivar



**Figure 6d:** Discussing land use in Cañar



Figure 7: Community Certificate



**Table 1: Institutional and disciplinary collaborations in Master's program 1<sup>st</sup> Cycle**

<b>Partner Country</b>	<b>Faculty/School/College</b>	<b>Disciplinary Expertise</b>
CANADA	UBC Faculty of Medicine	Infectious Diseases Occupational Medicine Respiratory Medicine Health Care and Epidemiology
	UBC Faculty of Land and Food Systems	Agro-ecology and Anthropology
	School of Occupational and Environmental Health	Chemistry/Environmental Sampling Environmental Health, Pesticides
	School of Community and Regional Planning	Disaster Preparedness
	Institute of Aboriginal Health	Aboriginal Health
	BC Centre for Disease Control	Environmental Health Vector Borne Disease Respiratory Health
	Mining Engineering	Mercury, heavy metals and toxic substances
	Centre for International Health	Global Health
	Liu Institute for Global Issues	Global Health Evaluation
CUBA	Instituto Nacional Hygiene, Epidemiologica y Microbiologica	Epidemiology Pesticides Sanitation Vector Borne Disease
MEXICO	Instituto Nacional de Salud Publica	Paediatric Environmental Health; Infectious Diseases Respiratory Medicine
	INER	
ECUADOR	Centro Estudios y Asesoría en Salud (Health Research Advisory Centre) And tutors	Critical Epidemiology Ecosystem Approaches to Human Health Mental Health Statistics Coverage of all areas

**Table 2: Summary of community-based Masters Thesis projects**

<b>Subject Area</b>	<b>Title</b>	<b>University</b>
<b>Dengue control (3)</b>	<i>“Dengue vector control with an ecosystem approach and community participation in the Machala Libre community, Ecuador 2007-2008”</i>	UM
	<i>Dengue control before and after having applied the “cleaned backyard campaign in Machala”</i>	UM
	<i>“Organophosphorated and pyrethroid pesticides dynamic used in vectorial control campaigns, their impact on biological indicators and the development of alternative strategies in the Jubones community”</i>	UM
<b>Water and waste (Pacific) (2)</b>	<i>“Participate action in a human consumption water management plan in Costa Rica Island”</i>	UM
	<i>“Implementation of a solid wasted management plan with sustainable development alternatives in Costa Rica Island community”</i>	UM
<b>Water and waste (Coast) (2)</b>	<i>“Quality and social management of water and its impact on the gastro-intestinal disease in El Retiro community”</i>	UM
	<i>“Prevention of diseases caused by hydric transmission throughout a community intervention plan in El Retiro community”</i>	UM
<b>Mining (3)</b>	<i>“Evaluation of the dynamic of the mercury in the air during gold extraction process in the Portovelo community and its forms of community intervention to mitigate human health impacts ”</i>	UM
	<i>“Participative action to promote health in the handcraft miners of Portovelo, Province of El Oro”</i>	UM
	<i>“Determination of mercury balance in the amalgamation process and attitude and perception analysis against contamination and public health problems”</i>	UM
<b>Water and waste (upper highlands) (4)</b>	<i>“Evaluation of water contamination from residual water in Cañar city its impact and possible mitigation with community participation of Tucayta”</i>	UC
	<i>“Sustainable participatory management of the Patococha highlands”</i>	UC
	<i>“Mitigation and evaluation proposal of the quality of water used in the Communities of Corrucco, La Posta, Chaglaban and Cuchucun”</i>	UC
	<i>“Management and water administration in the Tacabay watershed river, Azogues Community, Ecuador ”</i>	UC
<b>Air pollution (1)</b>	<i>“Handcraft brick and tile rescue as an ecosystem health defense for the San Jose de Balzain population”</i>	UC

UM: University of Machala    UB: University of Bolivar    UC: University of Cuenca

**Table 2** (continued): Summary of community-based Masters Thesis projects

<b>Subject Area</b>	<b>Title</b>	<b>University</b>
<b>Participatory Management</b> (2)	<i>“Curricular health proposal with an ecosystem approach to the Faculty of Medical Sciences within the University of Cuenca 2007-2008”</i>	UC
	<i>“Water and Health for development: Proposal for healthy water management and community development in San Juan de Gualaceo community ”</i>	UC
<b>Infectious disease</b> (1)	<i>“Infectious and gastrointestinal diseases: Prevention, antibiotics use and bacterial resistance in children. Correuco community. Tucayta Organization, Cañar, Ecuador ”</i>	UC
<b>Pesticides</b> (3)	<i>“Application of Bio-assays with onion bulbs and monitoring water safety in Azuay”</i>	UC
	<i>“Elements for an alternative and regulatory mainframe proposal in the production of flowers ”</i>	UC
	<i>“Exposure to pesticides and their effects on nutrition in the community of Santa Rosa de Totoras”</i>	UB
<b>Occupational Health</b> (2)	<i>“Health determinants and intervention strategies to improve occupational health in the Salinas communal spinning mill factory. Province of Bolivar”</i>	UB
	<i>“Study of labor condition in the Guaranda municipal slaughter house and its relation with contamination”</i>	UB
<b>Ancestral knowledge</b> (2)	<i>“Ancestral practices to resolve land and water conflicts in the indigenous communities of Corralpamba, Rodeopamba and Guantucoto in Guaranda, Province of Bolivar, Ecuador”</i>	UB
	<i>“Ancestral knowledge and reproductive sexual health in Santa Rosa de Totoras community and Ambrosio Lasso”</i>	UB
<b>Wastewater management</b> (2)	<i>“Evaluation of the Salinas river contamination and measurements identification for its mitigation in the province of Bolivar, Ecuador.”</i>	UB
	<i>“Evaluation of the impacts caused by contaminated residual waters, solid waste and tourism in Las Cochas, Province of Guaranda, Ecuador”</i>	UB
<b>Disaster preparedness</b> (1)	<i>“Evaluation of the Salinas river contamination and measurements identification for its mitigation in the province of Bolivar, Ecuador.”</i>	UB
<b>Risk communication</b> (1)	<i>“Implementation of an education and communication strategy for environmentally risk prevention and their influence on health quality of life in the Santa Rosa de Totoras, Bolivar Ecuador”</i>	UB
<b>Forestry management</b> (1)	<i>“Influence of the pine plantations (Pinus spp) on the change of the ecosystem structure in the highland and its links with the loss of natural resources in the Casaca Totoras forest”</i>	UB

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