PAPERS DO NAEA

ISSN 15169111

PAPERS DO NAEA Nº 242

# SOUTH-SOUTH COOPERATION FOR SUSTAINABLE DEVELOPMENT: LESSONS AND CHALLENGES OF HIGHER EDUCATION IN LATIN AMERICA AFTER WCHE 1998 (DRAFT)

**Luis Eduardo Aragón**

**Belém, Outubro de 2009**

**O Núcleo de Altos Estudos Amazônicos (NAEA)** é uma das unidades acadêmicas da Universidade Federal do Pará (UFPA). Fundado em 1973, com sede em Belém, Pará, Brasil, o NAEA tem como objetivos fundamentais o ensino em nível de pós-graduação, visando em particular a identificação, a descrição, a análise, a interpretação e o auxílio na solução dos problemas regionais amazônicos; a pesquisa em assuntos de natureza socioeconômica relacionados com a região; a intervenção na realidade amazônica, por meio de programas e projetos de extensão universitária; e a difusão de informação, por meio da elaboração, do processamento e da divulgação dos conhecimentos científicos e técnicos disponíveis sobre a região. O NAEA desenvolve trabalhos priorizando a interação entre o ensino, a pesquisa e a extensão.

Com uma proposta interdisciplinar, o NAEA realiza seus cursos de acordo com uma metodologia que abrange a observação dos processos sociais, numa perspectiva voltada à sustentabilidade e ao desenvolvimento regional na Amazônia.

A proposta da interdisciplinaridade também permite que os pesquisadores prestem consultorias a órgãos do Estado e a entidades da sociedade civil, sobre temas de maior complexidade, mas que são amplamente discutidos no âmbito da academia.

**Papers do NAEA** - **Papers do NAEA** - Com o objetivo de divulgar de forma mais rápida o produto das pesquisas realizadas no Núcleo de Altos Estudos Amazônicos (NAEA) e também os estudos oriundos de parcerias institucionais nacionais e internacionais, os Papers do NAEA publicam textos de professores, alunos, pesquisadores associados ao Núcleo e convidados para submetê-los a uma discussão ampliada e que possibilite aos autores um contato maior com a comunidade acadêmica.



**Setor de Editoração**
E-mail: editora_naea@ufpa.br
Papers do NAEA: Papers_naea@ufpa.br
Telefone: (91) 3201-8521

Paper 242
Revisão de Língua Portuguesa de responsabilidade do autor.

# SOUTH-SOUTH COOPERATION FOR SUSTAINABLE DEVELOPMENT: LESSONS AND CHALLENGES OF HIGHER EDUCATION IN LATIN AMERICA AFTER WCHE 1998[1] (DRAFT)

*Luis E. Aragón*[2]

**Abstract:**

In this paper I stress the importance of South-South cooperation to improve higher education and development in Latin America presenting the progress made since the UNESCO World Conference of Higher Education of 1998 (WCHE), held in Paris, and point out the challenges ahead. Special references are made to the Amazon Region. In general most of the initiatives of international scientific cooperation are in the direction North-South and are of diverse forms. With rare exemptions the most important scientific discoveries occur in developed countries, resulting as a consequence, an enormous gap between developed and developing countries concerning the generation of science and technology. To reduce that gap diverse forms of cooperation emerge to transfer knowledge from developed to developing countries including, technical missions, technical assistance, training programs in developed countries, and others. However, the possibility of transforming that cooperation in an efficient mechanism to transfer and generate science and technology in developing countries depends on the strength of local scientific capacity to absorb, adapt and expand scientific knowledge and on the capability of these countries to respond adequately to the rigorousness that scientific development demands. On the other hand, South-South cooperation, the cooperation between developing countries, has been traditionally very weak, ignoring the existence of important scientific institutions and universities in these countries that working in a coordinated and cooperative manner could strengthen their scientific capacity and power of negotiation. The paper analyses what can we learn from the Latin American experience, that could be generalized and be useful to interpret the role of higher education in moving forward the sustainable development agenda.

**Keywords:** Higher education. Latin America. UNESCO. Amazonia. international cooperation.

**Resumo:**

Neste artigo se salienta a importância da cooperação Sul-Sul para melhorar a educação superior e o desenvolvimento na América Latina, apresentando os progressos realizados desde a Conferência Mundial da UNESCO de Educação Superior de 1998 (CMES), realizada em Paris, apontando os desafios futuros. Referências especiais são feitas para a Região Amazônica. Em geral a maioria das iniciativas de cooperação científica internacional se da no sentido Norte-Sul. Com raras exceções as descobertas científicas mais importantes ocorrem nos países desenvolvidos, resultando como

[1] Paper elaborated for and presented at the Workshop on Sustainable Development and Higher Education, UNESCO World Conference of Higher Education. Paris, 5-8 July, 2009.

[2] M. A. and Ph.D. in Geography (Michigan State University), Post-doctoral training in demography (Brown University), and Latin American Studies (Stockholm University); special courses in regional planning and management of international cooperation. Professor and ex-Director of the Center for Advanced Amazonian Studies of the Federal University of Para (Brazil); ex-Executive Secretary of the Association of Amazonian Universities (UNAMAZ); fellow of the LEAD International Programme (Leadership for Environment and Development); and Chairholder of the UNESCO Chair in South-South Cooperation for Sustainable Development. E-mail: aragon_naea@ufpa.br.

conseqüência, uma enorme disparidade entre países desenvolvidos e em desenvolvimento sobre a geração de ciência e tecnologia. Para reduzir essa lacuna diversas formas de cooperação emergem para transferir conhecimentos dos países desenvolvidos para países em desenvolvimento, incluindo missões técnicas, assistência técnica, programas de treinamento em países desenvolvidos, e outras. No entanto, a possibilidade de transformar essa cooperação em um mecanismo eficiente para gerar e transferir ciência e tecnologia nos países em desenvolvimento depende da capacidade científica local para absorver, adaptar e ampliar o conhecimento científico e da competência desses países para responder adequadamente ao rigor que exige o desenvolvimento científico. Por outro lado, a cooperação Sul-Sul, a cooperação entre os países em desenvolvimento, tem sido tradicionalmente muito fraca, ignorando a existência de importantes instituições científicas e universidades desses países que trabalhando de forma coordenada e cooperativa poderiam reforçar a sua capacidade científica e poder de negociação. O texto analisa o que podemos aprender com a experiência latino-americana, que poderia ser generalizado e ser útil para interpretar o papel do ensino superior no avanço da agenda de desenvolvimento sustentável.

**Palavras-chave**: Educação superior. América latina. UNESCO. Amazônia. Cooperação internacional.


**ISSN 15169111**

## Introduction

The author of this document was invited to write a paper on the importance of South-South cooperation for building capacity in higher education, for the UNESCO Regional Conference of Higher Education in Latin America and the Caribbean of 1996 (CRES96) (Aragón, 1997). In this opportunity I revise that paper and stress further the importance of South-South cooperation to improve higher education and development in Latin America presenting the progress made since WCHE98 and pointing out the challenges ahead. Special references are made to the Amazon Region.

In general most of the initiatives of international scientific cooperation are in the direction North-South and are of diverse forms. With rare exemptions the most important scientific discoveries occur in developed countries, resulting as a consequence, an enormous gap between developed and developing countries concerning the generation of science and technology. To reduce that gap diverse forms of cooperation emerge to transfer knowledge from developed to developing countries including, technical missions, technical assistance, training programs in developed countries, and others. However, the possibility of transforming that cooperation in an efficient mechanism to transfer and generate science and technology in developing countries depends on the strength of local scientific capacity to absorb, adapt and expand scientific knowledge and on the capability of these countries to respond adequately to the rigorousness that scientific development demands.

Although the benefits of that type of cooperation in developing countries are unquestionable, it is also true that, in general, developed countries have benefitted significantly, causing in many cases dependence and reinforcing the brain drain syndrome. Undoubtedly the lack of mechanisms and programmes to reinforce and build scientific capacity in developing countries generate, in the long run, significant economic benefits for developed countries, including revenues from royalties of new scientific discoveries made by third world scientists working in those countries, that developing countries would have to pay for accessing them.

On the other hand, South-South cooperation, the cooperation between developing countries, has been traditionally very weak, ignoring the existence of important scientific institutions and universities in these countries that working in a coordinated and cooperative manner could strengthen their scientific capacity and power of negotiation, following the basic principle that cooperation should, above all, contribute to reduce the asymmetry between countries and build endogenous ways of reaching sustainable human development. "Cooperation makes sense only as a contribution for reaching adequate solutions in developing countries according to their own means and necessities," argues Ignacy Sachs (1994).

For UNESCO, South-South cooperation represents an important mechanism for development and peace, as summarized by the message of Mr. Koïchiro Matsuura, Director General of UNESCO, on the occasion of the *World Science Day for Peace and Development*, 10 November 2005[3]:

[3] www.unesco.org


**ISSN 15169111**

> South-South cooperation in science and technology provides valuable opportunities to promote development and peace. The development experiences of the South are rich and diverse. Whether through commonalities in history and geography or through similar development challenges, the countries of the South have important lessons to share concerning the difficulties they have faced and the success they have achieved. Scientific dialogue and collaboration, moreover, are vital mechanisms for building reciprocal interests and mutual understanding among peoples. UNESCO has long seen the volume of promoting the cause of peace through international cooperation in science and South-South cooperation has been and continues to be an important space of this work.

At the political and diplomatic levels several initiatives of South-South cooperation exist in Latin America, such as the Summit of Heads of State of the region, Mercosur, the Andean Community of Nations and the Organization of the Amazon Cooperation Treaty.

Strengthening of sub-regional blocks has demanded of international cooperation new strategies and definitions. In synthesis, international cooperation does not any more represent just technical or economic assistance; it has become an instrument for development that demands cooperative work, partnership efforts and alliances. Cooperation becomes, then, a strategic element, especially for developing countries, allowing unity in diversity, which implies respect to the identity, culture and values of each partner, at the same time looking for complementarities for mutual strength.

Such understanding is extremely useful to deal with environmental, scientific and higher education issues related to regions of utmost importance in the world such as the Amazon. Because of the enormous stock of natural resources and its important role in the process of environmental change, the Amazon has become an issue in the world's highest scientific and political forums, emerging, as a consequence, all type of treatment and demands. In this scenario, South-South cooperation emerges as a powerful instrument of the Amazonian countries to assure their sovereignty of the region, facilitate the identification and collaborative work among institutions with similar interests; strength and build scientific capacity in the region, and increase negotiation capabilities (Aragón, 1994).

**Relevance of Higher Education and Sustainable Development**

The UN Conference on Environment and Development (UNCED), Rio de Janeiro 1992, was centered on the paradigmatic concept of sustainable development, putting together two terms until then antagonistic: development and environmental protection - one could not exist without the other:

> Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs. It contains within it two key concepts: the concept of 'needs', in particular the essential needs of


**ISSN 15169111**

> the world's poor, to which overriding priority should be given; and the idea of limitations imposed by the state of technology and social organization on the environment's ability to meet present and future needs (Our Common Future)[4].

Today the concept of sustainable development is discussed in diverse forums and institutions generating enormous bibliography covering many scientific fields and relating to all type of human activities, but regardless of the theoretical perspective, all agree that such concept introduced new ways of looking at nature and the ways humans relate among themselves and with the environment. To respond to that challenge, radical measures are needed at all levels, including ethics, innovation, and relevant knowledge; that is, knowledge able to conduct people to perform new attitudes based on peace, environmental protection, universal values and human well-being.

Similarly the UNESCO World Conference of Higher Education (WCHE), Paris 1998, crafted, for present and future generations, the concept of relevance, equally paradigmatic:

> Relevance in higher education should be assessed in terms of the fit between what society expects of institutions and what they do. This requires ethical standards, political impartiality, critical capacities and, at the same time, a better articulation with the problems of society and the world of work, basing long-term orientations on societal aims and needs, including respect for cultures and environmental protection (UNESCO, 1998, article 6, p. 23).

Such a concept originated also studies, discussions and forums around the world, at different levels and from the most diverse perspectives, but all agree that that concept forced a new way of defining higher education and its role in society.

Putting the two terms together, it is clear that higher education, to have any impact in the quest for sustainable development, has to be relevant, which means education with quality, accessible and accountable. To face that challenge also requires radical measures at all levels, including ethics, content, methods, administration, resources and cooperation schemes.

For developing countries, relevance requires of higher education institutions proper identities which cannot just be mimetic of the ones in developed countries. Prof. Goolam Mohamedbhai, Secretary General of the Association of African Universities, is emphatic:

> This tendency of blindly copying what happens in the north has persisted over decades and continues to this day. Academic staff are promoted depending on the number of publications they have in refereed journals, which are exclusively published in the north, irrespective of whether the published material is of any local relevance [....] The concept of "quality" introduced in universities in the north, which actually originated from industry, was and is being applied in the south, without questioning whether the concept of "quality" in universities in developed countries is pertinent to developing countries [….] I am at times dismayed at hearing Ministers of Education in Africa proclaiming that they want some of their universities to be globally ranked among the

[4] www.UN-documents.net/oct-02-htm.


**ISSN 15169111**

> top 100, without really understanding what the university ranking business is all about.[5]

The mission of the university, then, must be redefined, based upon the principles of the WCHE 1998 Declaration: "Ultimately, higher education should aim at the creation of a new society – non-violent and non-exploitative – consisting of highly cultivated, motivated and integrated individuals, inspired by love for humanity and guided by wisdom" (UNESCO, 1998, article 6, p. 24). To do so, the university, without renouncing to quality and universality, must be inserted and be pivotal actor in the definition and promotion of national and regional projects founded on universal human values and committed to their own needs. The university must, therefore, take the lead in the definition and implementation of actions towards elimination of social exclusion, poverty, hunger, intolerance, violence, illiteracy, environmental degradation and disease; and the promotion of happiness, harmony, justice and social equity. In practice contribute significantly to reach the millennium goals (Dias, 2008).

Quality, therefore, cannot be restricted just to the production of "good" science and "good" teaching, in general defined in developed countries; it should respond to both, scientific as well as social relevance.

To be relevant and respond adequately to the challenges of sustainable development, higher education should, therefore, be conceived as a public good which means, among other things, that: a) access should be granted to all without any discrimination; b) the service should be continuous and permanent along the entire life; and c) be flexible, easily adaptable to new situations and contexts. By the contrary, global public good, as some pretend to define higher education, implies the idea of a universal model, in general the one of developed countries. The concept of global public good "justifies the creation and development of principles of quality of institutions that respond to that model and not to those that respond to the needs of specific societies" (Dias, 2008, p. 101).

## Progress in Latin America since WCHE1998 – towards sustainable development and regional integration

From several studies concerning the impact of the Declarations of CRES1996 and WCHE1998 on Latin American development can be concluded that the balance is positive but still very distant from the visions envisaged by the Conferences, and that the impacts are diverse in countries, sub-regions, sectors, fields and policies.

The need for strengthening regional integration and synergic international cooperation emphasized by CRES96 and WCHE1998 Declarations took force.

The Declaration of CRES1996 stated that:

[5] UNESCO Internet Higher Education Forum. https://communities.unesco.org/wws/admin/wche_forum, 6 June, 2009, 03:20.


**ISSN 15169111**

> While recognizing that globalization and internationalization is irreversible trends, support for these concepts should not lead to dominance or new forms of imperialism by major cultures and value systems from outside the region; rather, it is of vital importance that every effort should be taken to protect and promote the strengths of local cultures and scholarly traditions (UNESCO, 1998, p. 57).

To face that challenge, the Declaration continues:

> Higher education institutions must promote processes aimed at regional integration. Furthermore, cultural and educational integration should be the bases for political and economic integration. In a global environment, higher education institutions must approach their studies on regional integration in the light of the specific economic, social, cultural, ecological and political aspects involved (UNESCO, 1998, p. 60).

Several initiatives in the region advanced in that direction including networks, regional integration universities and partnerships.

There are thirteen university networks operating in Latina America and the Caribbean today, besides national associations and thematic groupings (Gazzola, 2008). Some networks cover the whole region such as the Union of Latin American Universities (UDUAL), or the whole continent, including Canada and the USA, such as the Inter-American Organization for Higher Education (OUI). Others focus on specific sub-regions such as the Association of Amazonian Universities (UNAMAZ), the Association of Universities Montevideo Group (AUGM), or the Central American Universities Council (CSUCA). Still others gather specific universities such as the Association of Macro Universities (AMU) which groups the largest public universities of the region in terms of students.

Those associations are slowly creating conditions and scenarios for endogenous development and consolidation of regional integration. International research teams covering issues such as water management, environmental change, deforestation, tropical diseases, and regional development are in progress. Exchange of students and professors, international events, publications, and missions are frequent, and courses in consortium, especially graduate courses, and distance and virtual education are initiatives being considered.

It is assumed that limitations faced by individual institutions are overcome through cooperation and joint efforts. Other advantages are the diversity of contents, practice of multi and interdisciplinarity, sharing of installations (laboratories, equipments, telecommunication), cultural interactions, geographic and historical learning and cultivation of friendship and culture of peace, among others. At the long run is this cultural integration through higher education that political and economical integration will be reached.

In synthesis, argues Jorge Brovetto (2008, p. 123) ex-Secretary General of AUGM, networks:

> should pursue the collective search for equity, quality and relevance through the creation of common academic spaces on the basis of scientific, technological, educational, cultural and political cooperation among their members [….] Sustainable development of society will depend, greatly, on the attitudes of these generations, of the possibilities offered to them, of their capacity and formation for the wised use of knowledge, of their abilities to create new sources of work, of their potential of permanent realization and renovation and of their possibility to interfere in the development process.


**ISSN 15169111**

More recently an innovative initiative is being experimented in Brazil: Implementation of federal universities of regional integration. Three universities are so far being created: the Federal University of Latin American Integration (UNILA), the Federal University of the International Afro-Brazilian Lusophonic Integration (UNILAB), and the Federal University of the Integration of the Amazon (UNIAM).

In December 2007, for initiative of the President of the country, UNILA was created with the purpose of forming students from Latin American countries in the most diverse fields and levels concerned with integration and regional development following the principles of WCHE1998. UNILA is a Brazilian public university but open to students and professors of the whole region. The university campus will be located in Foz de Iguaçú (State of Paraná), where three countries meet. It is expected to begin with 10000 students and 500 professors, being, in both cases 50% Brazilians and 50% of other Latin-American countries (Trindade, 2008).

UNILAB is another initiative of the Brazilian government with partnership of other Portuguese Speaking Countries (PSC) directly mainly to the African continent. Students will develop their studies at universities of PSC and in universities of their own countries. Diplomas will be issued by the universities of origin (Speller, 2009).

The third initiative, UNIAM, is also a Brazilian university, directed towards the integration and sustainable development of the Amazon region which involves eight South American countries. The university campus will be located in Santarem (State of Pará), and is expected to begin in 2010. This university is the culmination of a series of initiatives involving higher education in the development process of the region, especially through the work of the Association of Amazonian Universities (UNAMAZ) which completed 20 years in 2007 (Aragón,
2008; Acevedo, 2003).

Universities, individually, or in group are experimenting new methodologies to enlarge accessibility and inclusion. The United Nations University (UNU) and the Federal University of Minas Gerais (Brazil) with support of the State government implemented between 2001 and 2005 the Project *Veredas*. Combining presence and distance education methods, more than 14000 elementary school teachers were trained introducing relevant contents, including environment, pace and human rights. In the same line, UNU, with partnership of a national university in Argentina established in this University an Institute for the Management of Sustainable Development. And in 2003 UNU established together with the Bank of Brazil and support of several public universities, a project of regional sustainable development, benefiting more than 1 million families of deprived regions (Dias, 2008).

Another important experience is the South-South Cooperation Programme for Environmentally Sound Socio-Economic Development in the Humid Tropics that since 1992 is being coordinated by the Division of Ecological and Earth Sciences of UNESCO and implemented jointly by UNESCO, UNU, and TWAS. The central goal of the programme "is to test instruments for South-South co-operation in humid tropical areas, with special emphasis on network building, technology transfer and improvement of management know-how for biosphere reserves" (Clüsener-Godt, 2004). Universities and research institutes of the Humid Tropics have been benefited from this programme,


**ISSN 15169111**

and in 2009, through the UNESCO Chair in South-South Cooperation for Sustainable Development, and within the context of that programme, a memorandum of cooperation was signed by the Federal University of Pará (Brazil), the University of Kinshasa (Democratic Republic of Congo) and the MAB Programme of Indonesia to strengthen cooperation in science and higher education.

In a country of continental size and profound regional disparities such as Brazil, the Amazon, regardless of its importance for the country and the world remains underdeveloped and scientifically underequipped to face the challenges of sustainable development. This region, that is not only Brazilian, but shared by other seven countries and French Guyana, covers in total some eight million square kilometers and about 28 million people live there, mostly in urban areas, including cities of more than 1 million people (Belém and Manaus). Still 68% of the area and 72% of the population belong to Brazil (Aragón, 2005a). The Amazon region is one of the largest, most diverse, complex and rich natural domains of the planet. The area of the entire Amazon region corresponds to $1/20^{th}$ of the surface of the earth, $2/5^{th}$ of South America and $3/5^{th}$ of Brazil and contains 53 percent of the 9.2 million $km^2$ of tropical forests remaining in the world, about 15 percent of the fresh water of the world, and less than 0.5 percent of the 6 billion people living on earth. The relief includes valleys, plateaus (Brazil and Guyanas), high mountains (Andes), and the Atlantic coast. Huge abundance of fresh water, thick humid tropical rainforest, and biological and cultural diversity are common features of this enormous region; and its functioning is intimately related and dependent of each one of those factors. The Amazon river is considered to be the longest in the world, with 6,671 kilometers, the whole basin is constituted by more than 1,000 rivers and the discharge of water in the Atlantic Ocean is estimated between 175,000 and 300,000 cubic meters per second which would represent between $1/5^{th}$ and $1/6^{th}$ of the discharge of all rivers of the world. The discharge of the Amazon corresponds to four times the one of the Congo and ten times of the Mississippi; the Negro river alone, a tributary of the Amazon, contributes to 15 percent of the water that the Amazon discharges into the Atlantic and represents more than the discharge of all the rivers of Europe. It is estimated that the amount of water discharged by the Amazon in two seconds would be enough to cover the consumption of bottled water in the world during one day. As the Amazon River approaches the Ocean, the sediments accumulate to an estimated quantity of 1 billion tons per year, which the river discharges into the Ocean. Such sediments are dispersed along the coast up to the Orinoco delta (Venezuela), breeding one of the most biologically rich and fragile ecosystems of the humid tropics (Aragón, 2006).

But still, paradoxically, the region registers some of the lowest standards of human development of the world and there is consensus that without a robust system of science and technology in the region committed with the needs of the region, such paradox of abundance and poverty could not be resolved (Aragón, 2005b; Mello, 2007). To do so, it will be necessary to accomplish a "scientific revolution", says Prof. Bertha Becker (2005), putting to the service of the cause the most advanced instruments and competencies of contemporary science and local knowledge accumulated along history.

Progress has been made in that direction, but still the results are very modest for the challenges imposed. The diagnostic made by UNAMAZ for its $20^{th}$ anniversary concludes that:


**ISSN 15169111**

> Despite the significant growth in the number of higher education institutions over the past 20 years in most of the Amazonian countries, there is a trend in increasing the number of private institutions and traditional fields of knowledge, not really focused in the regional reality [….] "Brain drain" abroad and to more developed regions in each country is still an existent phenomenon in the region [….] permanence of scholars in the region is still a challenge to be faced (Aragón, 2008, p. 384).

To have an idea of the scientific deficit, in Brazil, the North Region (Amazon) possesses just about 4% of the 57,586 scientist with doctorate and 5 % of the 2,738 graduate programs of the country (M.A. and PhD).

Several initiatives, more or less impacting, are in course in Brazil to mitigate the problem including distance education, special research programs for institutions of the North, creation of State science foundations, multicampi universities and inter-institutional graduate programmes, among others.

Multicampi universities are arrangements trough which higher education can be disseminated in the countryside. The Federal University of Pará, for example, is integrated by the headquarters in Belem and nine campi in the interior of the State of Pará with their own structure, administrative staff, professors and students. Besides enlarging access, some fields offered in each campus obeys to local realities and needs, including graduate programs in those fields (Mello, 2007).

Inter-institutional graduate programs are developed with the purpose of building scientific capacity in the most deprived regions of the country through the mobility of professors, instead of students. Masters and doctoral programs evaluated by CAPES, the official institution responsible to evaluate graduate courses in Brazil, with a rank 5 or over in a scale up to 7, can offer these courses in other universities, in general those located in isolated areas with serious deficits of qualified personnel. Professor move to the university to teach the courses, and the diploma is issued by the University of origin. This model have accelerated the production of doctors and masters in the Amazon provided by important universities of the South including the University of São Paulo, Federal University of Santa Catarina, Federal University of Rio de Janeiro, and others. But the scheme also works within the Amazon region as graduate programs improve. The Center for Advanced Amazonia Studies of the Federal University of Pará in Belem, for example, offered its doctoral program on sustainable development of the humid tropics in the Federal University of Rondônia (Porto Velho) and Federal University of Amapá (Macapá), and her masters program at a local university in the city of Imperatriz in the State of Maranhão.

Those findings allow concluding that although universities, especially public universities, have assimilated the principles of the Declaration of WCHE 1998, the practice has progressed slowly. The impact of the Conference on the change of higher education making it more relevant, improving its quality, enlarging access, and consolidating a culture of evaluation has been very heterogeneous in Latin America; and its impact as an instrument of change on development processes has also been diverse in the countries of the region. There is consensus, however, that regional integration is a *sine qua non* condition to overcome the obstacles.


**ISSN 15169111**

**Lessons and Challenges**

What can be learned from the analysis above, that could be generalized and be useful to interpret the role of higher education in moving forward the sustainable development agenda?

Tünnermann (2008, p. 43) provides the clue:

> After CRES96 and WCHE98, Latin America and the Caribbean had at their disposition a *corpus* or a platform of concepts that raised the level of the debate on higher education and contributed, in diverse grades, to stimulate the processes of reform and innovation in course today. The World Declaration of 1998 has been, in many ways, the "guiding compass", the "navigation map" of the processes of transformation of higher education in our region in these last ten years, even though, many challenges remain, certainly, pending.

For example, figures from the UNESCO Institute for Higher Education in Latin America and the Caribbean (IESALC) of 2003 reveal, that (Gazzola, 2008):

a) The region counts with about 14 million students of higher education (60% concentrated in three of the 33 countries of the region: Brazil, Mexico and Argentina), but also counts with 37 million of analphabets;

b) Only four countries (Argentina, Panama, Chile and Cuba) have more than 45% of their population of 20-24 years attending higher education, while in most developed countries is above 55%; ten countries, including Brazil are under 30%;

c) Brazil graduates annually some 11,000 doctors but still possesses 15 million of analphabets;

d) Brazil and Venezuela are the only countries in the region with more than 1% of the GNP invested in science and technology;

e) The region produces 3.7% of the scientific production of the world, of which 83% is concentrated in Brazil, Argentina and Mexico; these three countries also concentrate 80% of the applications for patents of the region;

f) Mexico with 107,400 and Brazil with 139,000 concentrate, together more than 75% of graduate students of the region, which represent just 2.8% and 6.3% of the total students of higher education of each country, respectively;

g) Of the 2,188 doctorates existing in the region, Brazil concentrates 48%, Mexico 19% and Argentina 13%;

h) 213 universities of the region offer doctoral programs, of which 52 are in Brazil and 80 in Mexico.

Those figures represent samples of the challenges that developing countries should face to respond adequately to the purpose ambitioned by WCHE1998. The discussion could be centered on the following question: *What are the unique challenges faced by Latin America and developing*


**ISSN 15169111**

*countries in general to generate scientific capacity and relevant higher education capable of inducing change towards sustainable development?*[6]

The question is certainly an instigating one. For some the problems derive from the permanent dependency of developing countries of foreign science and technology; for others the problems derive from political, social and economic factors rooted through history of developing countries themselves. Perhaps both arguments are correct, which demand integrated approaches to solve the problems.

The executive secretary of the Third World Academy of Sciences (TWAS)[7] puts the issue this way:

> The challenge is, therefore, for developing countries to master modern science and technology and apply them to their own sustainable development requirements. To meet this challenge, radical measures are needed by Governments of the South and donor countries. These will include substantially more investment in research and development and full integration of science and technology into national development plans, building national and regional capacities in science and technology, intensifying regional cooperation, forging new partnerships with competent institutions in the North, and establishing strong national and regional alliances between industry and research institutions [….] Building indigenous capacities calls for strengthening research institutions and science education at all levels, as well as developing the human resources beyond the critical mass (Hassan, 1992).

The discussion could be expanded further by analyzing some of the most critical issues. Those are not the only challenges developing countries should face, the intention is to outline an agenda open to discussion where other factors can be added, and aggregating ways by which higher education could contribute to overcome such obstacles.

- *To diminish inequalities within countries*

Developing countries are characterized by possessing high degrees of inequalities including regional, social, gender, economic, and educational inequalities. Most opportunities are concentrated in big cities; wealth is concentrated in a few hands; and benefits of science and education reach only a few privileged individuals. Educational expenses are high for most of the population, especially at the university level. The best universities and research institutes are generally located in big cities, which capture most of the resources available; infrastructure and equipment are inadequate, deficient or obsolete in most cases. Highly trained human resources occupy in many cases bureaucratic positions because of more attractive wages, and limited conditions to conduct research and teaching. Dissemination of knowledge, even when produced in developing countries is very limited at the national level, or local languages. Most serious research results are generally published abroad; and very few patents belong to developing countries. Most research conducted in developing countries competes with the one conducted in developed countries while topics of interest of developing countries are placed on a second priority.

[6] Further discussion of this topic in Aragón (1994 and 2001).

[7] Today The Academy of Sciences for the Developing World.


**ISSN 15169111**

Higher education, to have impact in this challenge, should be taken as a state policy and be conceived within a national project and strategy. Access should be granted to all including those living in remote areas. Society in general should be alerted on this situation through the formation of citizenship so democracy can be assured.

- *To switch scientific research and higher education towards countries own interests*

The best option for developing countries would be to promote endogenous development, avoiding the easy solution of simply transposing current development models applied in industrialized countries. It is fundamental to recognize and be aware that knowledge has become a powerful tool of domination and a profitable product. The demand for higher education has increased enormously, especially in developing countries, converting it, by some, in a profitable business, who advocate that higher education should be considered as equal as any other commodity whose market should be regulated by the OMC (Panizzi, 2002).

Higher education must be taken as a public good and not as a marketable commodity. The proposal of considering higher education as a private service regulated by the OMC should be rejected. Distance and virtual education should be monitored and evaluated in each country. Several good examples of totally virtual education already exist such as the Open University of Catalunya (UOC) (Spain), that "accumulates international awards of excellence and was able to develop a methodology through which its students have more contact among themselves and with the professors than traditional universities" (Dias, 2008, p. 106); and the University of the Artic, a "collaborative effort of close to 30 institutions in several countries that share an interest in the sustainable development of the North and cooperate to provide education that is culturally adapted to the needs of the North and respectful of indigenous peoples' traditional knowledge" (Egron-Polak, 2009).[8] Efforts of integrating activities of universities within the same country or region should also be stimulated and evaluated.

UNESCO Chairs are important mechanisms to contribute to make science and higher education more socially relevant. By definition UNESCO Chairs are considered as

> "think tanks" and "bridge builders" between the academic world, civil society, local communities, research and policy-making, strengthening North-South and South-South cooperation, creating poles of excellence and innovation at the regional or sub-regional level and reinforcing the dynamism of networks and partnerships.[9]

As a contribution for the Decade of Education and Sustainable Development, for example, UNESCO Chairs are experiencing partnerships with the UNESCO Man and the Biosphere Programme (MAB) by working together with Biosphere Reserves. Biosphere Reserves are defined as

[8] UNESCO Internet Higher Education Forum. https://communities.unesco.org/wws/admin/wche_forum, 4 June, 2009, 14:40.
[9] www.unesco.org


**ISSN 15169111**

> Areas of terrestrial, coastal and marine ecosystems established to promote and demonstrate harmonious and sustainable interactions between biodiversity and socio-economic well being of people, through research, education, monitoring, capacity building and participatory management.[10]

The similarity of missions of those two UNESCO programmes represents enormous potential to be explored for generating synergies and strengthening partnerships. In this sense the UNESCO Chair on Sustainable Development and Environmental Education of the University of the Basque Country (Spain) is developing a series of research and teaching projects in the Biosphere Reserve of Urdaibai; and similar initiatives are being considered at the University of International Cooperation in Costa Rica. The UNESCO Chair in South-South Cooperation for Sustainable Development of the Federal University of Pará (Belém, Brazil) is coordinating a network of the nine Biosphere Reserves existing in the Amazon and helping in the formulation of a new Biosphere Reserve covering the coast of the region (Aragón; Clüsener-Godt, 2008).

- *To invest in science and higher education without jeopardizing social policies to solve the basic needs of population*

Another important obstacle to overcome in developing countries is the decision where to invest. Poor countries are compelled to solve basic needs, so little resources are left to invest in higher education and scientific research. The results of investment on science and education take long time to mature; so it must be planned through generations.

It must be recognized, however, that no country has reached development without adequate education. Higher education must be seen as the solution of many problems faced by developing countries and not as a burden for the economy. Partnerships and regional integration is essential to overcome the limitation of resources. Concerning Latin America, Prof. Ana Lucia Gazzola (2008, p. 129), former Director of IESALC is critical: In the contemporary world, "We will not have competitive inclusion as isolated countries. We don't have sufficient human capital, but together, identifying our own strategic niches at international level, we will be able to build competition targeted towards human sustainable development of our countries and region."

Measuring higher education in Latin America by the number of institutions and students, it is mostly provided by private universities, many of them of dubious quality. But the private sector cannot just be rejected. "It is impossible that public institutions alone respond for the demand of higher education," argues Prof. Gazzola (2008, p. 133). It is fundamental, therefore, to evaluate private universities and work together with the private sector, without renouncing to the principle of higher education as a public good.

- *To control brain-drain*

[10] www.unesco.org


**ISSN 15169111**

How to retain highly trained professionals in developing countries? In many countries highly qualified human resources are trained abroad, distant from the limited working conditions that those individuals face when returning, so many easily succumb to the opportunities offered abroad. Internally also deprived regions loose most of their best professional to institutions located in more developed regions.

Another form of "brain-drain" is the deviation of highly qualified people from scientific activities and teaching to bureaucratic positions, that could in many cases be occupied by technical personnel trained in administration.

Labor mobility is a consequence of unequal distribution of opportunities at international and national levels. Higher education can contribute to control this syndrome through regional integration, facilitating or implementing academic mobility and programs in consortium among institutions of the same country or countries of the same region. University networks play a critical role in this regard. The preparatory UNESCO forum of higher education also pointed out schemes based on Diaspora networks and other linkages establishing some type of knowledge remittances.

- *To reorient international cooperation*

International cooperation from the North to render significant fruits in the South should find fertile soil. To get that, scientific capacity in the South should be reinforced or be built. Regional integration strengths capacity and empower negotiation capabilities. Higher education can and should contribute to regional integration by consolidating the efforts of networks, multicampi universities, regional integration universities, and other schemes that contribute to better knowledge of the region and its needs. It is impossible to work today in isolation. Cooperation is essential particularly among developing countries. Networking speeds up transfer of technology and maximizes financial and technical resources. Lack of well-developed and well-functioning communication systems between scientists in developing countries keep them isolated from the mainstreams of knowledge. They are cut off from vital information denying them the insights and experiences of other institutions. Networks facilitate exchange of professors, mobility of students and joint research projects. Those schemes will permit to establish new terms of cooperation around the world.

- *To incorporate popular knowledge in scientific research and higher education agenda*

Many scientific discoveries are based on popular knowledge accumulated by generations, especially in areas such as pharmacy, medicine, biology and agronomy. Ethnoscience is a term used today to express this knowledge which should be linked somehow to science and higher education for mutual benefit.

Efforts are already made in this regard in Latin America, especially in the Amazon through the Association of Amazonian Universities, the Federal University for the Integration of the Amazon (Brazil) and the National Intercultural University of the Amazon (Peru) (Aragón, 2008).


**ISSN 15169111**

- *To improve interdisciplinary work*

Interdisciplinary work is the integration of fragmented knowledge possessed by specialists from different fields, applied to specific problems. In this sense interdisciplinary work is a practice to create epistemological frameworks to interpret reality. Well-grounded knowledge of specialized fields is a condition for interdisciplinary work, but new attitudes are needed for specialists to work together: willingness of working jointly, recognition of limitations, openness to criticisms, eagerness to learn from others.

Changes in scientific approaches and attitudes of scientists and professors are emerging, as old paradigms are unable to respond to critical issues today. The role and meaning of science itself is being questioned: Science for whom?; who should be the beneficiaries of science? What type of research should be conducted? Is it possible to explain and control everything through science? Is higher education relevant?

Interdisciplinary work is a key to solve some of those questions. Higher education needs to redefine fields and practices. At the graduate level some examples can be mentioned from Latin America. In Brazil the so called "multidisciplinary" masters and doctoral courses are in quick expansion. Even CAPES has created a new area establishing criteria to approve and evaluate these courses, and the National Council for Scientific and Technical Development (CNPq) stimulates the creation of multidisciplinary research groups.

- *To cope with globalization*

Globalization represents different things for developed and developing countries. Today, it represents the generalization of consumption and cultural patterns of developed countries. Globalization cannot be a new form of colonialism, but a process to strength relationships for mutual benefit. For developing countries it cannot represent the elimination of their cultures, popular knowledge, and social structure. To reach that goal, regional integration is necessary strengthening South-South cooperation initiatives and reorienting cooperation with developed countries.

- *To formulate, reinforce, and revise legislation concerning property rights, research, and higher education providers directing it towards the own countries interests and needs*

How to avoid bio-piracy? How to avoid patents of plants and products in developed countries extracted, in many cases illegally, from developing countries? Laws are needed to protect serious and responsible research made by foreigners and nationals in developing countries, in such a way that guarantees property rights of knowledge produced here, including the one accumulated through generations. Strict measures for the export of biological material must be formulated and implemented. Strengthening of research groups integrated by foreigners and nationals in equal conditions should be stimulated and promoted.


**ISSN 15169111**

- *To be accountable*

Bureaucracy in most developing countries is extremely complicated: processes are very slow, quality controls are inadequate, corruption is common, and the whole system is of very low responsibility, administratively speaking. All these factors make higher education more costly and with low degree of competitiveness. A culture of evaluation and accountability should be reinforced in universities.

- *To strengthen leadership*

Leaders of all fields, sectors, places, women and men are needed to create a new mentality oriented towards the reformulation of the mission of higher education and implementation of sustainable human development relevant to developing countries, capable of breaking barriers and promote initiatives directed to the benefit of all, present and future generations. Sir Shirdath Ramphal (1994), a native from Guiana and former Chairman of the International Steering Committee of the International Leadership for Environment and Development Programme (LEAD), clearly stated the role that higher education should play in the formation of future generations:

> We cannot afford to produce another generation of scientists blinkered by the belief that poverty and inequality within and between states are for the other culture, and that the scientific community will serve best if left to work untroubled by such distractions; or another generation of doctors for whom medicine begins where the architects and engineers end, and who see their professionalism debased by proximity of the grim realities of rural health care; or another generation of lawyers mindless of the social quality of the law whose rule they passionately uphold, like some elite imperial guard for whom loyalty becomes more virtuous tan justice; or, in general, more academics, particularly in the developing world, wedded to classical notions of pampered and privileged campuses [...] We cannot afford to produce, in the end, another generation of polished professionals assured of preferred places in the sun, rather than a cadre of truly educated people whose horizons are global welfare and who see their own and their society's prosperity not as ends in themselves but as elements in the totality of human happiness.

**Conclusion**

As a final thought, it could be concluded that science and higher education in developing countries have mainly been the result of models experienced elsewhere. Quite often those models have not been adapted to the needs, societies, and environments of the developing world. Therefore, the strengthening of relevant research and higher education in developing countries is a precondition for


**ISSN 15169111**

successful transfer of scientific and technical knowledge, and a prerequisite for a more balanced global development. Hence, top priority should be given to the development of endogenous manpower, enabling developing countries to strengthen self-reliance, which will ultimately allow them to foster authentic national and regional bases of higher education. Therefore, domestic capacity building becomes e *sine qua non* condition for implementing development programs capable of responding to local needs.

Production of knowledge directed towards the well-being of Man, which presents solutions socially viable, wisely using natural resources, and at the same time preserving cultural and biological diversity, represents a challenge for scholars of all fields and countries, but especially in developing countries. It is essential to educate people so that they will be able to lead change towards activities that avoid onslaught of the environment, promote the preservation of universal values, construct a culture of peace and work for equality and justice in this already globalized world. The larger the number of people with that capacity, the larger will be the possibilities of political intervention to deal with such problems which have already reached alarming proportions.


**ISSN 15169111**

**References**

Acevedo Marin, Rosa Elizabeth (Org.) *UNAMAZ: Um projeto de cooperação pan-amazônica*. Belém: UNAMAZ, 2003.

Aragón, Luis E. *The Amazon as a study object: Building regional capacity for sustainable development.* Stockholm: Institute of Latin American Studies/Stockholm University, 1994.

Aragón, Luis E. Fortalecimiento de la cooperación internacional horizontal en América Latina. In Yarzábal, Luis (Ed.) *La educación superior en el Siglo XXI: Visión de América Latina y el Caribe.* Caracas: CRESALC/UNESCO, 1997, p. 1143-1166.

Aragón, Luis E. *Ciência e educação superior na Amazônia: Desafios e oportunidades de cooperação internacional*. Belém: UNAMAZ/NAEA, 2001.

Aragón, Luis E. (Org.) *Populações da Pan-Amazônia*. Belém: NAEA/UFPA, 2005a.

Aragón, Luis E. Cooperação Sul-Sul para o desenvolvimento científico e tecnológico da Amazônia. *Parcerias Estratégicas.* No. 20, junho 2005b, p. 767-794.

Aragón, Luis E. The need for integrating conservation and development in the Amazon: changes, challenges and opportunities in the age of globalization. Keynote address, *International Conference on Humid Tropical Ecosystems: Changes, Challenges, Opportunities*. Kandy, Sri Lanka, 4-9 December, 2006

Aragón, Luis E. (Org.) *20 anos de desenvolvimento da educação superior na Amazônia: Uma contribuição para a Conferência Regional de Educação Superior – IESALC/UNESCO.* Belém: Universidade Federal do Pará, 2008.

Aragón, Luis E.; Clüsener-Godt, Miguel (Orgs.) *Reservas da Biosfera na Amazônia II*. Belém: NAEA/UFPA, 2008.

Becker, Bertha K. Ciência, tecnologia e informação para conhecimento e uso do patrimônio natural da Amazônia. *Parcerias Estratégicas.* No. 20, junho 2005, p. 621-651.

Brovetto, Jorge. Espacio común de la educación superior en América Latina y El Caribe. *Educación Superior y Sociedad/Nueva Época.* Año 13, No. 1, 2008, p. 115-124.

Clüsener-Godt, Miguel. Implementing agenda 21: Nature conservation and sustainable development in the humid tropics. *Tropical Ecology.* Vol. 45, No. 1, 2004, p. 183-186.

Dias, Marco Antonio. La universidad en el Siglo XXI: Del conflicto al diálogo de civilizaciones. *Educación Superior y Sociedad/Nueva Época.* Año 13, No. 1, 2008, p. 93-138.

Gazzola, Ana Lúcia. Cooperación universitaria: Internacionalización solidaria. *Educación Superior y Sociedad/Nueva Época.* Año 13, No. 2, 2008, p. 125-136.

Hassan, Mohammed. Strategies for building indigenous science and technology capacity in the South for sustainable, science-driven and environmentally sustainable development. In Aragón, Luis E. (Org.) *Desenvolvimento sustentável nos Trópicos Úmidos.* Belém: UNAMAZ/UFPA, 1992, p. 35-40.



**ISSN 15169111**

Mello, Alex Fiúza de. *Para construir uma universidade na Amazônia: Realidade e utopia.* Belém: Universidade Federal do Pará, 2007.

Panizzi, Wrana Maria (Org.). *Universidade: Um lugar fora do poder*. Porto Alegre: Universidade Federal do Rio Grande do Sul, 2002.

Ramphal, Sir Shridath. Enlightened leadership: Opening address at the Zimbabwe International LEAD session, LEAD Cohort 1. Harare, 18 March, 1994.

Sachs, Ignacy. The aftermath of the Earth Summit: Unfolding the process. In Aragón, Luis E.; Karlsson, Weine; Magnusson, Ake (Eds.) *Science, development and environment in Brazil: Experiences and options for the future.* Stockholm: Institute of Latin American Studies/Stockholm University, 1994, p. 227-239.

Speller, Paulo. Entrevista a Paulo Speller. *IESALC/UNESCO Informa*, No. 1990, 2009.

Trindade, Hélgio. UNILA: Universidade para a integração latino-americana. *Educación Superior y Sociedad/Nueva Época.* Año 13, No. 1, 2008, p. 149-153.

Tünnermann Bernheim, Carlos (Org.) *La educación superior en América Latina y el Caribe: Diez años después de la Conferencia Mundial de 1998.* Caracas: IESALC/UNESCO, 2008.

UNESCO. *Higher education in the Twenty-first century: Vision and Action – World Conference on Higher Education Final Report.* Paris: UNESCO, 1998.



**ISSN 15169111**